Turner

Science-Fantasy

WINTER 1950 ONE & SIXPENCE

THE ARK
by F. G. RAYER

COSMIC COLLISION — MYTH OR MENACE?

SPACE & TIME on Your Hands?

Then secure these absorbing books reviewed in this issue

THE KINGSLAYER, L. Ron Hubbard **19/6**
THE PORT OF PERIL, Otis Adelbert Kline **19/6**
NOMAD, George O. Smith **19/6**
BIG BOOK OF SCIENCE-FICTION, Ed. Groff Conklin ... **21/6**

and others, including

GENUS HOMO, Sprague de Camp and Schuyler Miller ... **19/6**
THE COMETEERS, Jack Williamson **19/6**

For further information, and details of other science-fiction books and advance publishing schedules, write for post-free

Postal Preview

17 BURWASH ROAD, PLUMSTEAD, LONDON, S.E.18

Fiction of the Future . . .

THE BEST science fiction, specially written by British writers for a discriminating audience, is available in Nova Publications.

IF YOU enjoy **SCIENCE-*FANTASY*** you should ask your newsagent for its companion magazine—

NEW WORLDS

—and if you hurry you may yet be able to secure a copy of the current Winter 1950 issue, featuring:

Guardian Angel *by* Arthur C. Clarke
Bighead *by* William de Koven
Deus ex Machina *by* F. G. Rayer
Robots don't Bleed *by* J. W. Groves
The Spirit of Earth *by* Sydney J. Bounds
Chemical Plant *by* Ian Williamson

NEW WORLDS . . . One & Sixpence

Science-Fantasy

VOL. I, No. 2

WINTER, 1950-51

CONTENTS

Cover by Turner ***Illustrations by Powell, Turner and Ernst***

WALTER GILLINGS, Editor

The contents of this magazine are protected by copyright and must not be reproduced without permission of the publishers. All characters, names and incidents in stories are entirely fictitious. No responsibility is accepted for material submitted for publication, and return postage must be enclosed.

SCIENCE-*FANTASY*, incorporating *Science-Fantasy Review*. Published quarterly by Nova Publications Ltd., 25 Stoke Newington Road, London, N.16. Printed in England by G. F. Tomkin Ltd., Grove Green Road, London, E.11. Price per copy: One shilling and sixpence. In Canada and U.S.A.: 30 cents. *Subscription rates:* Great Britain and the Commonwealth, 4 issues 6/6 post free; U.S.A., 4 issues $1.20 post free.

Going Your Way

ESTABLISHING a new magazine in these times is an undertaking fraught with difficulties, not the least of which is getting it out on time. The first issue of SCIENCE-*FANTASY* did not appear for several weeks after it had been promised, due to production delays most of which were quite unforeseen. This second issue, again, has been delayed by the dispute in the printing industry which affected many periodicals. It is, therefore, dated Winter 1950-51, an Autumn number having been rendered impossible. The next issue will be available in March, dated Spring 1951.

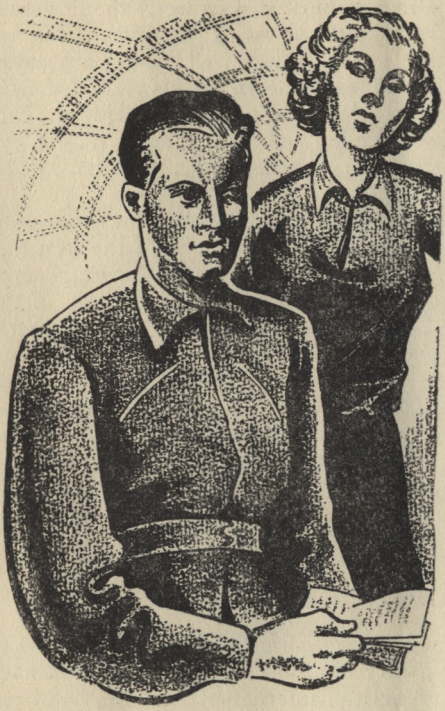
The response to the first issue of this magazine has shown, very definitely, that it is welcomed by thousands of devotees of science fiction and has captured the interest of many more who have been attracted by it. This is evident from the enthusiastic letters we have received commenting, sometimes critically but always appreciatively, on its contents. And what most clearly emerges from these helpful expressions of opinion is that all our readers are interested, not only in the science fiction stories we are presenting, but in the non-fiction articles and reviews.

SO OUR pronounced aims are fully justified. For as we proceed we intend to enlarge on our non-fiction content, while continuing to present the best short stories and novelettes we can obtain from our contributors. But we have no "fixed policy," except to feature both facts and fancies in such a way that all who are intrigued by this mysterious universe, and are blessed with imagination, will find them fascinating.

In its fiction, SCIENCE-*FANTASY* will keep a careful eye to what it considers the proper development of this medium for an audience more concerned with literary quality than with the familiarity of authors' names or mere extravagance of conception. In its factual content, it will cater for those who also want to be kept informed of the latest discoveries and speculations within the sphere of science-fantasy. For those who are interested in the field of science fiction itself, it will always be a source of information and guidance.

It will, none the less, be very considerably guided by readers' expressed requirements and desires, as it progresses. Already we have received many constructive suggestions, and we invite *you* to let us have your ideas, whether in the form of a letter or—if you can write one—an article for possible publication. It must, though, be such as will be likely to interest all our readers. At the same time, we shall be glad to receive further stories for consideration, especially short stories of 3,000 to 6,000 words; these must be genuine science-fantasy and have an original treatment. We are always anxious to encourage new writers in this field; we've been doing it for some time now . . .

THE EDITOR



The Ark

By F. G. RAYER

Of the struggling dregs of humanity only a few could hope to survive to build a new world . . . thanks to those who had foreseen their plight and planned their salvation.

Illustrated by Ernst

"THE TWILIGHT of the human race . . ."

Erik recalled the words his father had spoken upon the day he died, twenty-one years before. Ten minutes later had come that fearful tremor which had devastated large parts of Europe, and Professor Kato had been killed even as they ran from the house.

He remembered how his father had turned from the great, curved window, with its view of the white-capped mountains in the hazy distance, nervous fingers plucking at his silky white beard, his face lined and grey in the dull, foreboding light streaming into the lounge. Even as the old man turned, a sudden, growing rumble, immensely loud and distant, echoed through the oppressive air. The earth began to tremble ominously with great, shuddering pulses, and Erik felt that the divan on which he sat was striving to waltz round the huge circular room. He clung to its arms and peered anxiously through the window. Somewhere below, a heavy crash sounded; his half-empty glass of julep skated across the smooth table to tinkle into fragments on the composite floor. The lights pendant from the ceiling oscillated gently.

"Hmm! The volcano near Skagatara, in Scandinavia, I expect," the Professor announced shakily. "We will listen to the world newscast; then we had better follow the rest into open country, for safety's sake. It is as well you did not stay at college for your half-term vacation," he added, concern on his wrinkled face.

He crossed the room and slid back the panel concealing the audioviewer. Erik withdrew his gaze from an overcast sky of leaden yellow such as no human eye had ever looked upon before, and watched his father finger the dials. The screen flashed; a reproducer sprang to life.

"This is the world newscast for to-day—10th June, 2104. The great subterranean unheaval shows no sign of abating. Near the scene of the first disturbance, volcanic activity is very great and many new craters have appeared within the last few hours. No messages have been received from any of the Philippine Islands, or from Borneo or Celebes, and it is believed that the population of these islands is in danger of complete annihilation."

A map came on the screen, the areas mentioned outlined in red. "A report brought in by a trans-continental flier states that the whole of the Pacific Ocean lies under an immense yellow cloud of volcanic smoke and floating ash. Flying low over Formosa, the pilot saw that the southern end of the island had tilted downwards and been inundated by the sea, and the northern end was a mass of boiling lava. No survivors were seen, and it is believed that such conditions now cover most of the southern hemisphere."

Professor Kato's face was white. "The greatest disaster since the dawn of man," he said slowly. "Heaven help those who caused it! Never has science made such an error."

Erik did not reply. There had seemed much justification for the attempts to harness the Earth's internal heat, and none had suspected that they could have such disastrous results. Floris, a geophysicist of international repute, had been proud of the plan he had conceived; Tsi-Kweih, a superb engineer, confident of his ability to carry it out.

For over a century now, men had looked askance at atomic power. Its first industrial uses, with imperfect plant, had almost flung the civilisation of 2,000 A.D. into a new dark age. Radioactive infection—that had been the trouble. Coolants were activated as they surged through the piles and transferred their radioactivity to great rivers in the secondary cooling stations so that the waters were polluted, and no processing could remove the taint. Fish ceased to spawn; weed drifted in rotting masses near all the seashores of the world. Rising molecules of water had lingering radioactivity; rain clouds shone faintly blue in the night. In another hundred years, plant life—and man—might have been annihilated; but the fission piles were halted just in time.

SINCE THEN, all measures for the disposal of the dangerous by-products of atomic plants had proved equally futile. So, Floris had shown that the heat at the Earth's core could be tapped, and Tsi-Kweih had sunk the enormous shafts and tubes through which molten alloys were to be circulated to carry the

heat to the engines above. A few days before, the heat-exchangers had been set in operation. Now—

"The disturbances are spreading rapidly," the voice of the announcer continued. "South America reports that scores of previously extinct volcanoes along the Andes are erupting violently. Volcanic activity in Europe is also increasing, and earthquakes of unparalleled violence are reducing many cities to rubble. Wherever possible, people should take food and clothing into areas free from buildings. They should seek high ground, as tidal waves may arise at any time . . ."

The screen became blank, except for the waving line which showed that the station was still sending. But Erik could picture the catastrophe for himself, in all its horror. Earthquakes made every continent tremble. Old volcanoes erupted explosively, hurling masses of torn rock up through billowing clouds of smoke and vapour; new craters appeared, adding their lurid glare. Smoke and ash obscured the Sun, so that an unnatural night came soon. Cities tottered into rubble, the thunder of their collapse hiding the puny screams of the millions who sought unavailingly, with upflung arms, to stay downcrushing tons of masonry. Flames licked from the ruins, fitfully illuminating the heavy sky, and still the tremors increased in violence.

"This is fantastic!" cried Professor Kato, impotently. "Just because those two crazy men thought they could tap Earth's heat, the whole human race is threatened. Fools! They should have known that they would upset the balance of pressures. I warned them—but even I did not expect anything so terrible as this! The falling temperature was bound to cause reduced subterranean pressure and allow the sea to rush into the extinct craters in the Pacific. The steam blows Guam off the map; and then, when more water finds its way to the planet's core, there's this . . . this . . ."

The screen flickered to life again.

"It is now revealed that Floris and Tsi-Kweih have been done to death by the mob that stormed their laboratory this morning. Fearing this attack, they had locked themselves in, but the crowd was bent on revenge. Tsi-Kweih died trying to escape from an upper window, while Floris was dragged into the street and killed."

The screen blanked, and Kato, with a muttered exclamation, strode to the window. Erik followed him. The Professor rested his hand affectionately upon the shoulder of the slim figure scantily clad in linen shorts and shirt.

"It is noon, but the Sun has not shone to-day," he said at length. "We saw it yesterday—and I fear that is the last time it will ever shine upon Earth."

Erik was startled. "You mean—?"

"Yes." His father made a sweeping gesture. "The sky is yellow and dull. There are a thousand volcanoes in eruption." As he spoke the room quivered, and he steadied himself by placing a lean hand against the window-sill. "This must have far-reaching results, not only upon us but all life on this planet. Never before has there been such a titanic release of natural forces."

Erik gazed through the window. The sky had become so heavy that the distant mountains were now entirely hidden from view by clouds extending to ground level like a pea-soup fog. Looking up, he could not distinguish where the Sun might be. He pushed open the broad window, stepped out on to the balcony, then gave an exclamation. The terrace outside was covered with a minutely fine, brownish dust that settled slowly out of the sky.

"Yes," Professor Kato said, as a distant rumble shuddered through the air. "Volcanic dust. With it comes gloom—and twilight. The twilight of the human race . . ."

LOOKING BACK, Erik found that every subsequent detail stood out in his memory. The tidal waves, fortunately small; the rioting and stricken misery of peoples that followed the disruption of social life throughout the world, as a terrifying month of constant volcanic eruption dragged on. Social services failed; disease and famine decimated the population; and when the disturbance had settled down it was a sorry world in which he wandered—a world shaken and torn, existing in a semi-gloom caused by the polluted atmosphere.

But a lifetime of work was necessary to restore man to his former standing. Dwelling on the past would do no good—he must not degenerate to the cult of the Past-worshippers. With a shrug, he straightened his drooping shoulders, turned as the door opened. In the years that had passed since the Catastrophe he had shed all immaturity, had developed his father's incisive judgment. He had proved himself a courageous, stimulating Leader of Reconstruction.

A smile greeted him, from lips set in an oval face surmounted by flaxen hair which curled in ringlets around a clear-skinned forehead. Elena, his secretary, wore a white linen dress belted at the waist such as was favoured by all the Intellectuals. She closed the door behind her and stood before Erik, her face now serious as she referred to the notes she carried.

"The last attempt to precipitate the atmospheric dust at Station N5 has failed," she stated simply.

Erik's shoulders seemed to sag, and once more he stifled a sigh. The electrostatic discharges in which he had pinned so much hope had been useless, then. He should have expected it: had not all their experiments during the last decade proved as vain as his attempts to reawaken in the Workers the self-respect they had lost? The Intellectuals possessed insufficient skill, lacking the technical knowledge that was available before the Catastrophe.

"Must we give up hope?" he said slowly. "Why were so many valuable men killed, so much knowledge destroyed? We need their aid and the help of the lost technologies, as never before. No moisture rises, and our bones are chilled to the marrow for lack of the Sun's direct rays. I begin to fear I shall never bask in them again."

He turned to stare from the window, as he had done so often through the long years. He could see scarcely a hundred feet through the murk, in which the glaring electric lights glowed ceaselessly but dimly. He counted four—all the

rest were lost in the gloom which was so all-pervading that nothing could disperse it. Daily he had counted those four, wishing that some day he would see five, perhaps six, and know that the air was clearing. But it was always four: the chill air did not clear. Instead it was so thick that only a dull yellow glow showed when day had come. The lights were never extinguished; nowhere in all the world did daylight dawn.

There was a step behind him, and a slender hand brushed his shoulder gently.

"You worry too much," Elena said tenderly. "Your hair is grey—yet you are still young. Why worry about the Workers? We Intellectuals will survive, whatever happens. Give up this senseless struggle—"

Erik shook off her hand, frowning. "No. Animal life has died, all but the specimens we have kept, and vegetation too—and man will go the same way soon. The Workers need our encouragement, as we need them. Can we let everyone revert to savagery—become mere animals living from day to day, forgetting our human heritage?"

"If the others have not the will to fight, they are not worthy to live," she insisted. "Why waste your own life struggling for them?"

WITH A careless shrug, she moved slowly to the desk and began sorting out papers from the case she had left there.

"I have a report from the Astronomical Board," she said, as Erik seated himself. "That also is bad."

He knew that a giant comet was supposed to be approaching the Earth through space, but the clouded sky prevented observation, and he hoped fervently that further odds were not to pile up against them. The remnant of humanity which had survived the Catastrophe was in no condition to withstand an ordeal that had daunted even the world of his father's day. And the Workers were ignorant, superstitious, fearful . . .

Erik read the report in silence. There had been a scare in his early youth when the new comet, Pi Vagranto, had swept in from the boundaries of the Solar System, narrowly missing intersection of Earth's orbit. Next time, it was said, they might not be so lucky. The time of its return had been nicely calculated, but the old astronomers had died in the upheaval of 2104 or been killed in the Workers' Revolt of 2106 when most of their records were destroyed. Now the world lacked data on such phenomena. None could say with certainty what Pi Vagranto would do when it returned; but its threat had become more important with the passing years.

There were many gaps in scientific knowledge since the days of the Catastrophe. Fear-crazed peoples had said that Science was responsible for the disaster, and they had pillaged and destroyed whole libraries so that the scientists could never again try to tap the planet's heat or harness the energy of the atom. When sanity came, it was too late to repair the damage. All but the simplest processes were no longer available to mankind, except through the slow, painful way of rediscovery. The astronomers had salvaged a few bare facts or speculations on

Pi Vagranto, but even if they had reliable instruments they could not have observed anything through the murky atmosphere.

"So they fancy it's making a better shot at us this time," Erik mused, laying the papers down. "Its head may graze the atmosphere, and they estimate that the nucleus—which is remarkably dense, I remember—will almost certainly collide with the Moon and cause a heavy shower of meteors. Most of them will land on the Moon, but there will be repercussions on Earth, for which we must be prepared. If only we had more precise data . . ."

Elena leaned forward excitedly. "The Capsule will give it to us—and my brother, Crossland, thinks he has located it!"

"Yes? Where?" Erik's face brightened. The Time Capsule, which had been no more than a legend for so long . . . Buried on the eve of the 2106 rebellion by a small band of scientists, it would almost certainly contain exact information about the wanderer which had invaded the Solar System. For years he had cherished the hope that the Capsule might be found, for it was said to contain all the knowledge man needed to work his rehabilitation.

"Yes," Elena went on. "He has been taking magnetic soundings around the supposed site of the Capsule, and yesterday a large metal object was located."

Erik jumped to his feet. "Then we will go immediately and begin excavating!"

He hurried her from the room and along the corridors. As they hastened down the four flights of stairs in the scanty light, he wished that power were more plentiful so that they might have moving stairways as they did when he was a boy, and that the streets could be properly illuminated. But the synthetic fuels available were barely sufficient for their essential needs.

In a fragile pedal-car propelled by a hefty Worker, they swept through cold, dimly-lighted streets that were deserted except for a small crowd on a corner. Peering through the window of the car, Erik saw a score of youths and girls listening intently to a man standing upon the high steps of a doorway. Erik groaned at the sight of the crude banner behind the speaker.

"Yes," said Elena, following his gaze. "It must seem strange to you; but talk of the Sun and the Earth, when all was light, has a curious fascination for those born since the Catastrophe—I myself have felt it."

They soon reached open land beyond the city, where they alighted, to pick their way slowly across a field of sickly-looking grass. No vegetation thrived in the perpetual gloom, though sometimes a dead tree with gaunt, outstretched limbs loomed through the murk. At length they reached a tent where a light was burning. Cables snaked over the ground, and a portable generator was whining. A tall, slender man pushed aside the tent flap and came towards them : Crossland, Elena's brother, a few years her senior, skilful and reliable.

"You have located the Capsule?" Erik demanded.

Crossland nodded a sleek head. "Yes. We explored many square miles with dip-needles, and unless we err, there lies the Capsule—a mere hundred feet down." He raised his hand, and Erik saw a white pole placed in the ground a little distance away.

"Good!" He restrained his excitement with difficulty. "Get all the men and machinery available to work immediately. No time must be lost—understand?"

"Perfectly. You suspect that it will give us data on the comet?"

"And on other things . . ."

TWO DAYS had passed before Elena burst into Erik's room with the news for which he was waiting. "The Capsule has been unearthed and opened!"

"Yes—?" He thought he saw something like fear in her blue eyes.

"It has been brought here. It is below—will you come?"

Erik descended. The Capsule was a long, gleaming torpedo of incorrodible metal to which particles of earth still clung. The end had been unscrewed, revealing the watertight packages it contained, some of which had already been removed. Crossland came towards Erik as he entered the room and put opened papers into his hands.

"Pi Vagranto passes the Earth on the first day of 2126," he said.

Erik calculated rapidly. "That gives us a bare forty-five weeks. How close?"

"The fringe of its envelope will brush our atmosphere. The nucleus itself will cross the lunar orbit."

Erik consulted the flimsy, waxed papers. "These figures were compiled from careful observations—we cannot doubt them." He felt a bitter dismay. There was so little warning . . .

"The Capsule contains information on all the old sciences, preserved from

destruction—just as its creators hoped," Crossland said.

Erik looked at the packages being withdrawn one by one. Here was treasure—those lost arts and technologies, so essential to civilisation, were what the world now sorely needed. With their aid, perhaps they could raise mankind again. If they survived—

"All the information in the Capsule will be placed at the disposal of a Technicians' Board which I shall select," he said. "Nothing must be mislaid or damaged—every sheet is irreplaceable. Make a careful inventory and report to me when it is ready."

IN HIS room in the Leaders' Building, Erik operated a bell-push on his desk. Seconds later the door opened to disclose a small man with long arms who stood respectfully awaiting orders. He was a typical Worker, stunted of body and low in intelligence.

"Have all the Workers' Leaders summoned," Erik told him. "They are to come immediately to the Leaders' Chamber."

"Yes, Master Kato." Fear showed in the twitching fingers of the stumpy man, though his features were resigned. Watching him, Erik felt both pity and revulsion. Here was a man who, in common with most of the survivors of the Catastrophe, had been so overwhelmed by the disaster and its consequences that he had ceased to fight. He looked like a thoroughly whipped monkey; yet he was among the best specimens of the Workers. The others, labouring in the synthetic fuel plants and the great hydroponic nurseries which consumed three-quarters of the available power, were mere shadows of men, never aspiring to such a position of trust as Kobold had.

But the Intellectuals would not allow the human race to fall to pieces within a mere two generations, or the Workers revert to the cave-man existence which otherwise might be their lot. The rising generation were dull and stupid; their parents whined about the hopelessness of their lives, and talked only of the days before the Catastrophe. Those with courage and determination to carve out a new future numbered scarcely more than a thousand, though there were many times more Workers.

Kobold was still standing silently by the door, and Erik felt a sudden irritation at his servility.

"Go now!" he snapped. I have myself notified the Intellectuals' Leaders, who will meet first. Hurry!"

He waited at his desk, greeting the Leaders of the Intellectuals as they arrived and passed into the Chamber. When all were present, he joined them.

"My fellows," he announced, "a situation of some gravity has arisen following the discovery of the Time Capsule. Were it not for one piece of information which it contains, and which has confirmed the surmises of our astronomical researchers, the mass of data which it has put into our hands would solve all our problems. But this one thing is all-important—yet it may save us from overwhelming disaster."

There was tense silence as he briefly related the details which verified the impending approach of Pi Vagranto and the probable effects. When he had finished there was a confused murmur of voices, and Austin, the Leader of Food Production, rose ponderously to his feet.

"Why were we not told of this before?" he demanded, his flabby cheeks pale in the dim light. "All our work—it will be in vain."

"We did not have definite information until now," Erik retorted. "It would have been senseless to cause anxiety. Now we must lay our plans for the future—quickly. There is still time, but none to waste."

A second Leader, white-haired and feeble, rose slowly. "Can we be sure that the threat is so severe?" he asked. "I recall that last time the comet came our way there were no effects except an unjustifiable hysteria. Even if it should come closer this time, can it hurt us?"

"According to the warning in the Capsule, which we cannot doubt, there will be great atmospheric disturbances, particularly in these regions. The nucleus of Pi Vagranto is so vast and so unusually dense that, when it collides directly with the Moon, as it must certainly do this time, it will cause perturbations which, though slight in themselves, are bound to have effect on the Earth's tides. There will be great floods, and we shall certainly perish unless we prepare to save something from the wreckage."

"But what preparation is possible?"

"That, too, the Capsule suggests," Erik went on. "The scientists made plans for us, knowing the day would come when we would have to meet this emergency —though they did not realise how difficult it would be for us, with so few resources, to put them into operation. They propose that a large vessel—an Ark—should be built from an alloy they describe. It would be airtight and buoyant, and would carry as much food, fuel and other necessities as possible, together with a selected crew. They propose that some animals should also be taken, and seeds. They suggest that when Pi Vagranto recedes and the flood subsides, the survivors could emerge to form a new community. They recommend that many such vessels be constructed, but we shall have barely sufficient time and materials for one."

The elderly Leader nodded. "And the thousands of Workers—what of them?"

"They cannot be taken, obviously. But it may be possible to construct reinforced buildings upon high ground, stocked with food and fuel." He paused. "Now, if anyone has any point to raise, let him speak, before we implement these plans."

"I gather that all the Intellectuals cannot be taken aboard," said the first questioner, mopping his white face with a handkerchief. "How will you choose those to survive? Of course, we Leaders will be of the party—"

"Not necessarily," Erik interrupted. "An Examining Board will be appointed to decide who shall enter the vessel, and their moral courage and physical capacities must be considered first."

"Outrageous!" Leader Austin thumped a moist hand on the table. "As

Leader of Food Production, I shall demand admittance!"

Erik cut him short impatiently. "This question will not need attention for some months. Are there any points of immediate importance to raise?"

They looked at one another, and the white-haired Leader rose. "This plan appears sound enough; if it were not, its proposers would not have suggested it. Our survival seems to depend on it—what more is there to say? I propose that the work be commenced immediately."

There was a murmur of agreement. Erik raised his hand as the Leaders began to leave their seats.

"One more point. I shall now advise the Workers' Leaders of the project, in the most general terms. Do you agree that they should be kept in ignorance, for the moment, of the real purpose behind it and why it is necessary? It will save undue panic."

There were renewed murmurs of assent. Erik followed the Leaders out of the Chamber and returned to his desk, where he pressed a button to summon Elena. He told her what had been decided.

Her blue eyes narrowed as she put the question: "You are sure you will not let anything impede your plans—your concern for the Workers, for example? It would be foolish to consider them now, at the expense of those who would help to found a new community."

Erik's eyes clouded. "I wish it were possible to save them all, but we have only time and materials to construct a single vessel in which we must accommodate all the Intellectuals that we can. Even then, it will be comparatively few, and only the best can qualify. As for the Workers, I'm afraid they will have little chance of survival," he admitted sadly.

Elena smiled reassuringly. Simultaneously there was the sound of shuffling feet, and they turned to see Kobold waiting at the door.

"The Workers' Leaders are ready for assembly, Master Kato."

Erik nodded curtly. "Let them come in."

As Kobold turned, he exchanged glances with Elena. How much had the dolt heard, he wondered?

AFTER THREE months of feverish activity, the Ark began to take shape. Technicians worked like madmen, making calculations based on their examination of the plans from the Capsule. The crew must have food and fresh water; there must be oxygen apparatus for use if they were submerged, medical supplies, and quarters for men, women and beasts. A long list of stores and equipment was drawn up and examined time and again for possible omissions. A list of names, too, was scrupulously examined, in conjunction with personal records; and every day the list became shorter . . .

Even Elena could not gain access to that list, though she would dearly have loved to get her hands on it. She knew that it would not be revealed until the last moment who had been chosen to go in the Ark, though to her it seemed a foregone conclusion that Erik and her brother Crossland, who was engaged in its

construction, would be among the fortunate ones; and she could not imagine that the selectors would be so heartless as to exclude her, if Crossland was to go. For herself, she could not bear the thought of separation from Erik, but she dare not broach the subject with him; he would have scorned her unmercifully.

Day afer day she went to watch the Ark grow on the hill in the centre of the city, until it was a great, gleaming egg-shape with a single sliding door and the interior fittings were being installed. Then she could no longer resist the urge to go closer and inspect it, with the approval of Crossland. He smiled at the eager look in her blue eyes as he walked down the ramp to meet her.

"The whole of the lower part of the vessel will contain fuel and stores for ballast," he explained. "There are two engines—one for generating current to work the interior mechanisms, including the gyrostat; the other to provide forward motion. If we get into violent seas, a little steerage-way will make all the difference, and we do not know how far we may have to travel before the floods subside or we can find unsubmerged land."

She followed him round to the bows of the vessel, where he pointed to a large opening set low down in the smooth hull. "See that hole? It's a tube that runs right through to the stern. The propellers are in there. No amount of pitching or running aground can damage them."

"It's wonderful," Elena agreed. "But how many will it hold?"

"Only fifty, now. Materials were short and we had to reduce dimensions. A great deal of space is taken up by provisions and other things that must be taken if we—if *they* are to survive." He suddenly corrected himself, as though he had been taking too much for granted. But Elena ignored his apologetic look.

"Fifty! That is very few—a mere handful of us." Her beautiful face showed her increasing doubt of her inclusion among them. She could not bear the thought.

"Yes," Crossland agreed. "But the fewer go, the greater in the long run will be their chance of survival. Remember that the Earth will not be very hospitable after this visitation. It will be a struggle for survival, and the provisions will not go very far if there are too many to share them. On the other hand, if there were fewer than fifty . . ."

But Elena was not listening. A wistful smile lighted her face, now, and her eyes held a faraway look. Crossland's words seemed to justify the thoughts which had been forming in her mind all these anxious weeks. She had told herself that her slowly dawning plan was too bold and brazen to succeed, but if her future were not to be assured otherwise, it would be worth the attempting.

Why should she be left out, when other women were to go—to go with Erik, as forerunners of the new race? Why shouldn't she go with him, who had so long rebuffed her, and shut all the rest out at the last moment, so that they two would survive—she and Erik alone, together? If they alone emerged from the Ark, what more was necessary to justify the project?

"Come and look inside!" Crossland's invitation, as he moved towards the great, open door, awakened her to a quick response. The more she learned of the vessel, the better; all she needed was the opportunity. With her head held back

and lips slightly parted, she moved lightly up the ramp.

A small man with long, swinging arms watched them go through the door, then emerged from behind a pile of stacked equipment beside the ramp. As they disappeared from view, he shambled off towards the Workers' residential section, grumbling in a low tone. As he passed one of the squat, reinforced concrete structures that his toiling fellows had erected upon the hill, he muttered more distinctly to himself.

"Master Kato himself says they'll be useless. Only those in the Ark—those precious Intellectuals—will have a chance . . . Yet we are more than they. Why must we be the ones to drown?"

ERIK EXAMINED the Ark with satisfaction. Built from the new alloy, it formed a complete, self-contained little world whose inhabitants had been carefully selected for their fitness to survive. They would emerge into a dark, cold world, rendered more inhospitable by the cataclysmic forces which would shake and tear at the foundations of their prison; yet they should have a chance to live as long as it remained intact.

"We must not delay too long," he told Crossland, as they tested the air-generating apparatus in the stern. "It would be dangerous to be caught outside. As soon as there is the slightest sign of disturbance, the Chosen must be immediately notified and taken aboard."

Crossland switched off the humming apparatus. "Everything is in order here. There is little more to be done—except to say farewell to those who must stay behind." He grinned wryly. "I'd give my share of the food stores to see Austin's face when he finds he has not been selected—poor devil!" Then his face became grave. "I wish I knew for certain about Elena, though . . ."

Erik did not reply. He led the way down the long, central gangway, from which other passages led off on either side. Once he went along a corridor which opened on to a large compartment filled with cages and cubicles. Quick, bright eyes flashed at him in the dimness, and there were soft squeakings and gruntings.

"Anyway," said Crossland, "the animals seem to have adapted themselves."

Erik regretted that the chosen specimens were so few, but they had had to limit themselves to those which were useful. Other compartments held seeds and stores. Outside, they stared up at the Ark's great rounded side. Erik was about to turn away when, abruptly, Crossland gripped his forearm.

"Shhh—listen!"

With ears straining, Erik caught the faint sound of running feet, lightly shod. As he peered, he cursed the perpetual fog which enveloped them, limiting visibility to a few yards even in the illuminated area about the vessel. The footsteps grew louder; then Elena, running wildly, burst into view.

"Quick!" She seized his hand with trembling fingers. "Into the Ark—the Workers are coming!"

She pointed back the way she had come, and Erik heard a distant, savage murmur which rapidly became an excited talking and shouting. Gesturing

Elena towards the door of the vessel, he stood halfway up the ramp, waiting, while Crossland escorted his sister into the Ark. The shouting grew louder, then suddenly ceased. As Crossland reappeared beside him, squat figures loomed up out of the murk, side by side. A score of Workers faced them, chests heaving, their lank hair disarrayed.

"It's him!" cried one, pointing an accusing finger. "He did not tell us what is going to happen. Yet he made us build this thing so that he may save himself and a few others of his kind. And we—we shall all die!"

"Kill him—and the other one! They are all against us—kill them!"

A score of throats took up the cry. The figures advanced slowly, threateningly. Erik waited until they reached the foot of the ramp, then raised an arm. They stopped, instantly on their guard, like half-cowed animals.

"Wait! Now, go back. There is no room here for you—nor for most of your Masters. Go to your own shelters, where there are places for all who may secure them. You have food and supplies. But hurry, and take your women and children with you. Those who are slow may be left outside!"

They shrank back, their dull eyes wide with fear and uncertainty. Two or three whispered harshly among themselves, then turned and raced away. The others lingered for a moment, then, muttering, shambled after them.

Erik breathed his relief. "Crossland—go at once and see that the Chosen are instructed to assemble in the Ark without delay. I will stay here and look after Elena. Yes—she must come with us. Now, hurry!"

Eagerly Crossland disappeared into the gloom. As Erik turned, there was the patter of hurrying feet from the side and Kobold materialised, his face twisted with anxiety.

"Master Kato! The Workers are rising! They have heard that the comet is coming—that they may all drown. They are like frightened beasts, and are revolting against the Intellectuals."

"Yes, Kobold—we have just had evidence of that. A few of them have been here—"

"A few?" Kobold's long arms dangled helplessly. "But there are hundreds in the city, where the ringleaders have gathered. They are storming the Leaders' Building, demanding better protection, wanting to see you. When they find that you are here—"

Erik groaned, uncertain for a moment where his duty lay. After a second's hesitation, he took Kobold's long arm. "Then we must get into the vessel, in case they send a larger deputation. Come, Kobold."

THEY WENT up the ramp into the Ark, where Erik stood guard at the door, ready to close it immediately. He was glad that they had been too busy struggling for the bare necessities of life all these years to make—or want—weapons. The Ark was designed to withstand buffeting seas, and would never be breached without explosives.

He glanced at Elena's pale face as she stood, strangely silent, beside him.

Kobold fidgeted uneasily. It was inevitable, Erik decided, that the truth should at last penetrate even the sluggish intellects of the Workers, though their reaction was unexpected—and might be disastrous, now. A lot depended on Crossland. If the Chosen could be notified and each contrived to get out to the Ark before it was too late . . .

Erik thought it unlikely. He was disturbed; yet, though he could not account for it, he did not feel despair. Somehow Elena's presence, the knowledge that she was safe with him, was remarkably comforting. And Kobold—if he had anything to do with divulging the purpose of the Ark to his fellows, at least he was loyal now.

"Master Kato—" Kobold's keen ears had caught the sound of upraised voices in the distance. "They are coming!"

Their breathing quickened as they waited, straining to catch the sounds which grew louder every second. Erik thought he could distinguish shouted phrases:

"Down with the Intellectuals! . . . leave us to die . . . the ship we built on the hill . . . room for the Workers . . . safety . . ."

The shouting subsided. A confused babble of voices grew and grew, and suddenly a host of Workers burst into the lighted area around the Ark. Some of them carried crude banners bearing Sun emblems. Their clothes were disordered, their hair loose and ragged about their ears, their eyes wild with excitement and fear. The banners were uplifted as the ringleaders renewed their chant.

"Down with the Intellectuals! Into the ship—there lies safety!"

They swarmed up the ramp, brandishing tools and pieces of wood and stone. Realising the futility of trying to reason with this mob, Erik motioned Elena and Kobold aside as he quickly closed the door and secured the lock. The Workers still came on, swarming around the plastic window alongside, pressing their faces against the surface and grimacing insanely.

Erik felt a light touch on his shoulder. Elena pointed through the window, upwards. "Look!" she said, in an awed voice.

Raising his eyes, Erik let out a gasp. High in the sky, brooding ominously over the scene, was a faint reddish blur of light. Its source could not be distinguished, yet it seemed to penetrate the miles of polluted atmosphere above them as though it would burn up the heavens. It was obvious what it was.

"The comet!" Erik whispered, and realised that those outside had seen it too. A great, fearful sigh swept through the mob as heads were turned skyward. Then they were attacking the vessel with renewed fury, hammering upon the metal hull with their stones, swarming back and forth across the ramp, pushing each other from behind, fighting and clawing to gain admittance.

Erik bit his bloodless lips as he watched the rabble through the window. Even if they came in time, how could he let the Chosen into the Ark while these semi-crazed creatures stormed outside? And if he were forced to let any of them in, and they survived, what hope was there for the future of humanity? Such stock could bear no good fruit. Just look at them, flaunting their ridiculous emblems, battering at the door, shrieking to be admitted, their features distorted with

terror as they cast furtive glances every so often at the dull red glow in the sky.

Instinctively he slipped an arm about Elena's shoulders as, with a shudder of disgust, he turned away from the window.

"They will all die," the girl said flatly, her blue eyes cold, her lips taut and shapeless. Kobold, still gazing fearfully at the heavens, muttered miserably.

SOMETHING IN Elena's toneless voice stirred Erik, then. He turned back to the door, undecided. The girl moved a restraining hand, but he shook her off and with sudden resolution opened the door a few inches, turning the locking handle to hold it secure. The shouting of the crowd bore in on them deafeningly; then, as Erik appeared in the gap and raised his hand, it stopped abruptly.

"Workers, listen! Every moment you spend here lessens your chances." As he pointed up at the sky, he thought the red glow shone a little more brightly and was certain that a rising wind was beginning to sigh around the Ark, scattering the crowd with dust. "Go to your buildings. Take warm clothing, if you can. Bar yourselves in against the coming storm. Join your comrades—they will have a chance to come out alive!"

He paused, relieved to find that his words were having some effect. A few of the rabble fell back. But one who carried a banner in the forefront of the mob turned to shout to his fellows behind, gesturing crazily.

"Don't let him fool you. We shall die—there is no room for us in the shelters. Into the ship!"

They all surged forward again, shouting and screaming. Erik had started to close the door when a trembling hand stopped him.

"Master, I am one of them. Let me go outside. Perhaps they will listen to me." Kobold's eyes were unusually bright, his voice alive with rare eagerness.

"Right," Erik agreed quickly, stepping aside. "Tell them they must go—quickly, while there is yet time."

He stood marvelling while the little man whirled the release wheel of the door to widen the opening. Had Kobold the courage to face that mob? He must have under-estimated him sadly. But he had ample room, now, to get through, and he was still turning the wheel.

"What are—?"

Even as Erik stepped forward with a question half-formed, Kobold, with surprising agility, leapt upon him, spun him round, and wound his strong arms about him like pinions. Then, through the opening he had made, he shouted: "Into the Ark—quickly!"

There was a roar of triumph from those outside, one of whom had already slipped through into the vessel. "Turn that handle to open the door wide!" cried Kobold, as another appeared behind him. The man hastened to obey, while Erik struggled to free himself from Kobold's iron grip. With a startled cry, Elena ran off down the gangway. As more Workers shoved through the door, Kobold suddenly released Erik, who raced after her. It was useless trying to stem the tide of the attackers.

Fifty feet along the passage, a communicating door marked the centre of the vessel. Urging Elena through it, Erik slid the door to quickly, dropped the securing lock. For the moment they were safe; there was no other way into that section of the Ark. The door was a safeguard for use if the outer shell were breached.

He listened intently, ear pressed against the metal. There was the sound of running feet and the thud of stones against the door; cries, muffled by six inches of alloy, then silence. The Workers were debating how to get through to them.

Elena regarded Erik anxiously. Her lips quivered, and her fingers clutched at a tear in her white linen dress where grasping hands had seized it.

"They won't go away," she whispered. "We are alone—with them!"

Erik led her down a corridor and looked from a window. All around the Ark the elated Workers milled, intent upon the open door. Straining his eyes through the fog, now tinged a pale crimson by the suffused glow of the comet, Erik saw a group of white-clad Intellectuals standing helpless in the background, unheeded by the mob. As he watched, others joined them.

"The Chosen are coming," he told Elena, beside him. "But they will never get through that rabble—"

The loose clothing of the Workers outside was flapping wildly about their limbs, while the fog swirled before the increasing gale. Erik thought he felt rather than heard a shrill whistling which made the vessel shiver throughout its length. Elena felt it too, and clutched his arm.

"What's that?"

"Only the rising storm. It is the work of the comet. It must be very near."

The Workers were struggling against the wind while they elbowed and jostled each other, trying to force a way into the shelter of the Ark. Some, on the outskirts of the crowd, gave up the struggle and fell to their knees, raising frightened eyes heavenwards. Shielding their faces from the storm, the little group of Intellectuals bunched together and moved nearer the vessel.

ERIK DRAGGED himself from the window. "We must help them! I must try to drive the others out—I think there is a way. Come with me, Elena!"

He ran down the gangway towards the stern of the vessel, into the generating-room. From a locker he took a long roll of stiff cable, bared one end, and fixed an adaptor-plug to the other while, at his direction, Elena started the lighting generator. He flung over the master switch of the plant, gathered the cable in his arms, and ran back to the central door on which the Workers were still hammering furiously.

"Simple, but effective—I hope," he said, as he fitted the adaptor into a socket high up in the passage wall. "See?" Grasping the cable firmly, with the bare end well out in front of him, he approached the metal door. A vivid, crackling spark sprang from the bare wire to the door, and he laughed grimly. "That should curb their enthusiasm. Now—open the door!"

While he retreated, Elena obeyed. The Workers, suspicious, instantly fell

back, and Erik advanced towards the opening, the stiff cable extended. With a snarl, one of the men rushed towards him. As his body came in contact with the wire his shriek echoed down the corridor, and he crumpled up on the floor.

The others drew back and Erik advanced further, dragging the free cable behind him. His nostrils twitched from the smell of burned flesh as he passed the fallen man, the bare wire held out like a lance before him in the narrow passage. The Workers retreated, fear in their faces. One, pushed by those behind, touched the wire and fell with a half-choked cry in an inert heap. The others, then, turned in a wild stampede down the gangway towards the door of the vessel, shouting to their fellows to clear the way as they fought to find escape from the Ark.

Erik let them go. With a cry of defiance he closed and secured the door. Shouting a warning to Elena, he turned and retraced his steps, the cable held carefully in front of him. Passing through the communicating door, he disconnected the cable, turned off the generator. When he came out again Elena had disappeared along the passage. He followed, and heard the sound of hammer blows as he neared the main door.

Elena, a heavy wrench in her hand, stood by the door. The operating handle was buckled and twisted. There was a strange light in her eyes.

"Elena! Have you gone mad?" He clutched her wildly, then threw her aside and fumbled at the door-handle. It was jammed. He shook her again. "You fool—you crazy fool!"

She flung back her head and laughed hysterically. "There's just you and I now, Erik," she cried, her eyes shining in the dim light of the passage. "You and I alone will be the forerunners of the new race!"

Erik stepped back, releasing her. He could find no words to express his bewilderment.

"The others will never get in," she went on, more calmly. "It is too late now—look!"

Erik peered through the window. The wind was whipping across the lighted clearing with such fury that those outside could scarcely stand against it. Their cries of terror penetrated into the vessel, even against the whistling of the gale. Carried by the wind, great swirls of dust were sweeping up out of the murk, which grew darker with every second. Suddenly, a flash of lightning lit the scene with stark brilliance; then the heavens seemed to open and the rain came down with such force that the milling crowd broke up and dispersed as if by magic, leaving a little group of white-clad figures huddled together a few yards from the foot of the ramp.

"Fool!" Erik's rage was uncontrollable. "The Workers have gone, and our fellows are still there. What possessed you to try to keep them out? We must find a way to let them in—there is no time to repair the damage you have done."

"Oh, no—no!" Elena, sobbing, threw her arms about his shoulders. "There will still be us—what else matters?"

"And what of your brother? At least, you might have thought of him!"

He shook her off roughly. "He was one of the Chosen—you were not, and now I realise why. I should never have brought you in!"

In an agony of mind, he left her there and ran back to the generating-room, where one of the vessel's great ventilators was situated. Elena, of course, would not think of such things as alternative means of ingress. With frantic haste he spun the control wheel, and the daurite flap, fully three feet in diameter, slowly opened. It was the work of a few minutes to remove the grille; then, pushing head and shoulders through the opening, he waved and beckoned wildly as he shouted against the raging of the storm.

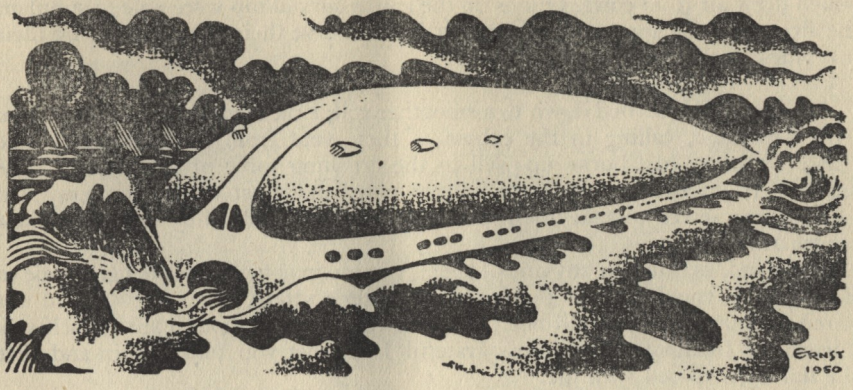
FAR ABOVE the murky blanket of Earth's atmosphere, the approaching comet shone balefully in the sunlight. Of moderate dimensions but phenomenal density, it had escaped the gravitational pull of mightier planets to complete its thirty-years' journey round the Solar System in the elliptical orbit to which it was now confined. Its core was an enormous mass of rock and metal fragments, debris it had picked up on its earlier, more distant travels; while about the nucleus swirled great volumes of tenuous gas and finer particles, streaming behind in a stubby tail.

Had it collided with the Earth on its original visit, mankind would still have survived to suffer the greater Catastrophe which followed ten years later; for even the most menacing comets were never capable of the dreadful destruction which mankind has expected of them. The most that might have happened would have been much less disastrous than the results of foolhardy tinkering with Earth's internal forces, which were always more insidious than a comet's puny mass. But the rare combination of Pi Vagranto's crowded nucleus and the intersection of its orbit with that of the Moon made its closer approach on this occasion a far more subtle menace.

Though its direct collision with the Earth might have caused no more than a heavy shower of meteors, most of which might have fallen harmlessly into the oceans or upon untenanted areas of Earth's surface, its effect upon the lesser mass of the satellite would be sufficient to upset the delicate balance of forces regulating the Earth-Moon system. Far greater havoc would result from interference with the smooth ebb and flow of the tides, and the severe inundation of the areas where man still eked out his precarious living.

So, the Moon trembled beneath the bombardment of the material in the visitant's core as the comet struck her, engulfed her, and passed on. Vast clouds of pulverised rock swirled above her pitted surface; her cold lava-beds were riven, her mountains battered and torn. Thousands of new craters, large and small, were born out of her rocky substance as it was fused by the heat generated by the colliding particles. The Earth, too, received its share of meteors, which were mostly consumed by the atmosphere; but disaster came when the remnants of the comet passed, leaving the Moon oscillating in its orbit, staggering beneath the sudden impact and striving to recover itself.

Under its erratic gravitational pull, the oceans of Earth rose in fury. A mighty



tidal wave was born in the Pacific, and surged eastward, building up against the American continent until it broke in chaos over Panama, torrented into the Caribbean. The Atlantic swelled; receding waters disclosed a thousand new islands in the Indian Ocean, and the wave broke along the coasts of Europe and Africa. Ports were overwhelmed; seas invaded the valleys, bearing a flotsam of uprooted trees and debris on their churning backs. Under the heavy yellow sky the waters raced, striking a glowing city in one instant into darkness; the next, bearing up and outwards a tiny metal egg that bobbed and whirled like a cork in a maelstrom . . .

Inside the Ark, Erik and his fellows listened to the tumult of the raging seas gradually subsiding as the great wave swept onwards and was gone. Bruised, sick and shaken from the violence of the vessel's motion, all were yet thankful for their deliverance from a more luckless fate. It had been hard, slow work hauling themselves, one after another, up the smooth side of the Ark, buffeted by the howling wind and drenched by the rain breaking in torrents against the vessel. The last man was almost exhausted when willing hands helped him to scramble up the improvised ladder of cable and Erik closed the ventilator through which the rain was pouring.

Soon the vessel had begun to lurch violently as it was lifted from its cradle by the encroaching seas; and they had hardly time to reach their padded couches before it was borne swiftly aloft on the crest of the tidal wave, to sink, rise and sink again beneath the seething waters in a riot of sickening motion. They could only cling to their handrails and breathe prayers for their deliverance while the pitching and tossing continued, day after day, until the Ark rode the waves which slapped at the plastic windows and water extended to the limit of visibility in all directions.

Then the gyrostat which had been powerless to offset the unleashed forces of the tide had begun to exert its steadying influence on the vessel, and the blowers

which drew air from cowled tubes on the ship's curved top were able to supplant the air-generating apparatus. It was vital to conserve their power and spare their machines as much as possible.

AS THE ARK settled down to a smoother roll, Erik made a tour of inspection with Crossland, calling in the cabins as they went from bow to stern. The whole structure had borne up well to the crushing force of the waters. The animals, frightened at first, were calmer now, and most of the company had roused themselves to take their first nourishment while they discussed their recent ordeal.

Crossland, as much as any one of them, was anxious to express his gratitude to Erik. "It is you I have to thank for my sister's safety," he said. "I had not dared to imagine she would not be among the Chosen, though she herself was uncertain. I cannot tell you how grateful I am that you took her in and that she has been spared with me."

Erik smiled uneasily. "What else could I do?" he asked, and only then realised how odd the question must have seemed to Crossland. "Never mind," he added hastily. "Tell me, how is she?"

"Not very well, I'm afraid. She is resting in her cabin. Later she will tell you herself how grateful she is. I think, though, that she feels unworthy . . ."

Erik felt relieved that he would not have to face Elena yet awhile, though more on her account than his own. Now that all was well, with brother and sister united, he could not feel resentment towards her; rather, he felt a strong compassion towards her, and was ready to attribute her behaviour to an excusable anxiety over her possible separation from Crossland—or was it from himself? Anyway, it was better for all concerned that he forget the whole unfortunate affair. His attitude towards her would be resumed on the basis of their past relationship, once she had recovered from her rebuff. As far as the rest were concerned, they need never know that she was not one of the Chosen.

But the matter was not to be so simply resolved. As he entered a corridor leading to the storerooms with Crossland close behind him, his jaw dropped open in sudden shock. There, at the end, stood a figure he knew well but which he had not expected to see again.

"Austin!" Crossland, too, was amazed. "What are *you* doing here?"

The man's flabby face was pallid; his whole body shook as with the ague. Clearly, he was as shocked at his discovery as Erik was to see him. But he recovered himself quickly as he approached them, blurting defiantly:

"I—I had to come! I felt I was needed. And, after all, why should I stay behind? Why was I not chosen? I may lack the physique of men like you, but I too am a Leader and my mind is equal to any situation—"

"Leadership was no criterion," Crossland said sternly. "We have left many Leaders behind, with others more deserving than you!"

The fat cheeks trembled, then puffed out vainly. "My fund of experience is rare; you will find it invaluable."

Erik's brows contracted. The Leader of Food Production, though capable enough, had none of the virtues which had been demanded of the Chosen. His age, of itself, was against him. It had been agreed to spare the most youthful, vigorous Intellectuals who, in addition to intelligence, had resourcefulness and courage. Such a combination of assets was to be found in a comparative few among the hundreds of young men and women who had been considered. Those who had not been selected had surrendered themselves to their fate as philosophically as their elders—or all of them except Austin.

"You have been hiding here, I presume?" Erik demanded.

Austin grinned slyly. "Of course—just in case you ran across me too soon. I believe you had prior notification of the Chosen, although they did not know themselves until the last whom they were. I knew I would not be amongst them, so I—er—took the precaution of slipping aboard quietly and secreting myself among the stores."

He paused, significantly. "I was here, Kato, when you yourself came aboard with the charming Elena. I could not help hearing some slight disagreement, even after you had disposed of the Workers' claims to a share in our salvation . . ."

Erik felt Crossland's eyes upon him, but he held his peace. Austin went on meaningfully, very certain of himself.

"I appreciate your motives, of course—her case is very similar to mine." He smiled with mock sympathy at Crossland. "But I wonder if the Chosen would approve of her presence any more than my own—"

"Why, you—!" Crossland had stepped forward and grasped the man's wide shoulders before Erik could restrain him. But he checked himself at Erik's command, while Austin retreated slightly, smoothing his clothes with podgy fingers.

"We understand you perfectly," Erik said. "But it is not for fear of any trouble you might cause that we shall treat you, for the moment, as though you had a right to be here. Later, we shall consider your case on its merits—meanwhile, be careful."

He brushed past Austin, who stood breathing heavily, his eyes half-closed, thick lips pursed stubbornly. For a second Crossland glowered hatefully at the plump figure; then, with an imprecation, he turned and followed Erik along the corridor.

THE DAYS dragged by while the Ark ploughed steadily through the waves towards an unknown goal. Though the instruments they had incorporated into the vessel, following the old scientists' careful plans, told them the depth of water beneath them, they had no charts by which they might navigate towards a new haven; for in the twenty years following the Catastrophe there had been no communication with the world beyond the confines of that which Erik knew.

For most of his life there had been no transport other than the pedal-cars they used to get about the city and to make occasional excursions beyond its boundaries. There were no motor cars, no airplanes, no ships; although they were not far

from the sea, few had been there, and only the memories of the longer-lived held any knowledge of the lands beyond the sea. If there were men there too, they had never penetrated to the great, half-ruined city where all who had survived the Catastrophe in this part of the world had finally herded together to make of life what they could.

In the vessel's control-room was a compass—the first most of its occupants had ever seen—which enabled Erik's navigator to hold to a straight course in a direction where, the oldsters had said, they would discover mountains whose tops were tall enough to be left high and dry by the swollen seas. But, though the Capsule had contained maps of the world as it was before the volcanic eruptions, they were of little use now except as a rough indication of the globe's main land-masses. There had been no exploration of the new face of the world before the Workers' Revolution had plunged mankind's remnants into a deeper despond from which, after two decades, they had hardly begun the slow climb back to civilisation.

Erik had only the haziest idea of where the Ark was bound; nor would his hopes have been better founded if he had, since the effects of the tidal waves caused by the comet were mostly unknown to him. It was certain that his own little world had been submerged, never to rise again. If there *were* men living in the mountains they might have survived, but it was doubtful—the cold would have driven them into the lowlands long since. The only safe assumption was that the world was desolate except for the little handful of humans whose destiny was now linked with his own.

But although the rest of the company quickly settled down, under his captaincy, to a routine as free of monotony as they could make it, there were two whose discontent as soon became evident to each other. Austin's presence on board had come as a slight shock to Elena, but she was too disconsolate to concern herself with it until he forced himself upon her. Feeling herself an interloper and wishing to avoid Erik, she had kept to her own compartment as much as possible. But finally, at Crossland's urging, she began to venture into the saloon where the rest met to pass the time in idle discussion.

Austin made no attempt to conceal his awareness of her situation; rather, he seemed to take an unpleasant delight in it.

"You are unhappy, my dear, and I can appreciate why," he sympathised unctuously. "He is too proud, that Kato, with all his high motives. But he will fall, never fear. Then, when he has need of you, he will be glad to return your affection."

"Perhaps," she said, non-committally. As she fought down a surge of the revulsion she had always felt towards Austin, Elena wondered why he should be so interested in the relations between her and Erik. How much did he know?

"He is too headstrong, and the success of this project—up to now—has given him a sense of authority which is dangerous in such a man. A Leader should have humility . . . Your brother, now—he would not behave so foolishly."

"No?"

"No. I am not sure that he is not better fitted to have command of this undertaking. In fact, I would feel a good deal safer if he were in Erik's shoes."

"Then why was he not appointed instead of Erik?" Elena feigned interest while taking care to give no sign of agreement.

Austin spread his thick fingers. "The Leaders, as a whole, were not always as wise as they might have been. Erik has done well enough, with the help of Crossland. But if the Ark's complement felt that Crossland would make a better captain, who is there now to prevent it? Our lives are our own to direct whom we may to safeguard them—"

"After all Erik did to save you when you were locked out—by the Workers?" she ventured, hesitantly.

She thought she saw a ghost of a smile flit across Austin's chubby face before he replied: "Certainly! He did no more than Crossland would have done had he been inside. After all, are we not better companions for him than they would have been?"

Elena said no more. Again she wondered: how much did Austin know? Obviously he did not realise that it was she who had locked out the Intellectuals—or did he? Even Crossland did not know . . .

AUSTIN DID not pursue the subject, then. But several times during the days that followed he sought conversation with her, and always he hinted at the desirability of Crossland's assuming the leadership. How he must hate Erik! But so did she, in a different way. His studied indifference to her, which showed whenever they met, ate into her woman's soul, tempting her to seize any opportunity to compel his attention—or, if he would not accept her, to revenge herself for the insult.

By simulating no more than a healthy feminine curiosity, she encouraged Austin to reveal the full extent of his desire to see Erik supplanted by Crossland—which was all he conceded of a plan that, she suspected, went much deeper. Either Austin imagined he would get more of his own way with Crossland in command, or he wanted to wrest the leadership away from Erik for himself—and this was the more likely, with such a man as Austin. What a fool he must take her for, if he thought she could not see through his naïve scheming!

Nor could she—as far as it went. For Austin had been careful to arouse in her only the uneasy suspicion that he knew more than he would reveal, at present, of her own duplicity. If, through this veiled threat, he could enlist her support in discrediting Erik enough to shake the company's trust in him, he might blast their confidence in both him and Crossland by accusing them of having conspired together to ensure Elena's admittance to the Ark instead of his own—as one rightly chosen! It would be a bluff, but rather than reveal her own guilt they would be forced to admit his story. Kato was just the sort to indulge in such heroics. After that, it should be easy to seize the position of power he craved—and hold it.

But first it would be a subtle process of undermining the influence Erik exerted

over the affairs of the Ark and its occupants. There would be growing discontent, a falling away of the ready discipline he expected of each one in the interests of the whole. Already there were ample signs that some did not relish being cooped up indefinitely in their metal prison, at the mercy of the seas, quite uncertain of their future. Austin thought the situation would soon become irksome, and that with a little encouragement it could be made intolerable. The main thing was to ensure, by suitable suggestion and criticism, that Erik would be blamed for their discomfiture.

And, in his extremity, Erik would become more responsive to Elena. In telling her just sufficient of his plan to win her co-operation, Austin insisted on that, as though it were all for her benefit. Once he found he was no longer the object of general approbation, Erik would turn to her for solace, satisfied to leave the responsibility to Crossland. Crossland would make a much better Leader . . .

Austin did not say precisely what he expected of Elena, except that her part in the plan would come later. Whether it was by accident or by some design of his that the first setback came so soon, she could not decide, but she believed Austin must have had a hand in it when, that same evening, the Ark's driving-engine spluttered and died. There was talk among the men of a blocked lubrication channel which had caused overheating; the consequent damage, it was said, would take some time to repair.

So the vessel drifted aimlessly while they waited for the renewed hum of the propellers which had become so familiar. But it was only a couple of hours before they were under way again, in an apparently endless search for sight of something other than churning water and the wall of dull fog which hemmed them in.

Next day it was the gyrostat that failed, leaving the vessel rolling in a sea which had suddenly become very disturbed and threatened to overwhelm them. Soon the Ark was pitching and tossing helplessly in the teeth of a howling gale and great waves were rolling over her, necessitating the closing of the ventilators and the use of the air-generator. Elena knew, then, that Austin must have gone to work in earnest. As she lay prone in her cabin, clinging to the handrails, she began to wish she had not fallen in with his mischief-making; but she gained some consolation from the thought that, although he could not have engineered the storm, he was suffering as much discomfort from it.

The gyro, once working again, stopped the vessel's crazy lurching, and she went towards the saloon where Austin was already intent on spreading dissatisfaction among the Chosen. As she entered he was declaiming loudly against the inefficiency of Erik's engineer, and the captain himself, while taking care to apportion some of the blame to the long-dead designers of the vessel. Though his hearers seemed to agree with him mostly out of politeness, it was evident that they harboured grave doubts. He appealed to her in turn as she sat down beside him.

She ignored his complaints. "Are you sure you are not placing us all in jeopardy?" she whispered.

He hissed at her. "Not here!" Then, in a louder tone, with an unctuous

smile: "Our voyage seems none too propitious—but I suppose we must be thankful for our deliverance."

ELENA SAW that the fat man's face was streaming with perspiration. It was close; the air seemed heavy and drowsy, and the others were lolling back in their seats as though exhausted. She stifled a yawn, overcome by a sudden lassitude, and wanted desperately to sleep.

Austin was breathing noisily. "There is no air in here," he wailed. "More inefficiency! If we must not open the ventilators, at least they might see that the air supply is properly regulated."

A frightening thought struck Elena. A moment later it was partly confirmed. Crossland appeared at the door of the saloon. He announced calmly:

"I'm afraid there is some trouble with the air-generator. There is no cause for immediate alarm, but you may find breathing difficult in some parts of the vessel. If it becomes absolutely imperative we shall open one of the ventilators, but while the storm continues it is not advisable. Please give us time to effect repairs to the apparatus, and all will be well."

While he was speaking his gaze lighted on Elena and Austin, sitting together. She thought his eyes hardened as he looked at the stout man, and was certain that he cast him a glance of supreme contempt as he turned and withdrew hastily.

Elena turned to Austin. His face has taken on an awful pallor, and his eyes dilated as he returned her gaze. "N-no!" he whispered hoarsely. "It wasn't—" Then, with a furtive look around him at the white-faced occupants of the room, he struggled to his feet and made for the door.

Elena followed him into the gangway. He brushed off her nervous, inquiring hand. "No, I say! It was nothing to do with me, I swear!" And she knew that he was speaking the truth.

It was easier to breathe in the passage, where others were congregating as they deserted their stuffy cabins. Anxiety showed in their faces as they waited, murmuring among themselves, gulping at the precious air. Austin made no attempt to exploit the situation. Instead, he eased his bulk between them, making for the other end of the corridor, obviously intent on getting well away from Elena. Seeing the stark fear in his sweating face, she let him go.

But, as the minutes passed and her breathing became more and more laboured, the urge to follow him grew irresistibly. She must find some other place where there was more air. If there was such a place, trust Austin to have discovered it! Muttering apologies, she thrust her way through the crowd.

The gangway led through the central door towards the bows of the vessel where the control-room was located. Next to it lay the animals' quarters; and it was there, she felt, the wily Austin had gone. There was a big ventilator there . . . As she turned the corner into the side passage, she glimpsed a man emerging from the control-room and stepped quickly into the shadow to wait for him to pass by. He did so, in a hurry, but not so fast that she could not see it was Erik, nor catch sight of the expression on his face. It was taut, anxious.

The door to the animals' quarters was closed, as always. She hesitated a moment, then grasped the handle and opened it wide. A slight draught of welcome air wafted past her into the passage as she stood on the threshold of the dim-lit compartment. She heard a hurried movement, then saw the white face of Austin as it turned towards her in the gloom beyond.

He was kneeling down by the big ventilator, wrenching at the handle which kept it securely fastened and which had been locked in its turn as a precautionary measure. As soon as he saw her, he ceased his straining and gasped at her: "Shut the door—quickly! No one must see—"

She saw his utter desperation and closed the door behind her. "Lock it!" he wheezed, and she obeyed. Then she stepped forward.

"You fool! You mustn't open that ventilator. The waves will sweep in. It is not far above the water-line, and the seas are still high."

"Nonsense! Must—get a breath—of air!" He gasped out the words as he strove with all his might to turn the handle. He cursed, then pulled himself ponderously to his feet, his plump chest heaving with his exertions. "Locked—can't move it. Must be some way—"

Frantically he rummaged in a corner, emerged with a heavy bar of metal. Panic surged in Elena's breast as she realised what he was going to do, to what lengths this cowardly creature would go to gratify himself even if it meant jeopardising the safety of all others. She moved to wrench the bar from his grasp—but not fast enough. With surprising speed he turned, raised his thick arm, and brought the iron sharply down upon her wrist. She shrieked with the pain and drew away from him, her head reeling.

"Keep away! I'm going to—open it! No harm—letting in some air—" Austin's eyes were starting out of their sockets as he croaked at her. He raised the bar again, brought it down on the handle once, twice, a third time. It gave, and, still grasping the bar, he started to turn the handle quickly, his breath coming in great, sobbing gasps.

Through a dim haze as she stood, swaying, Elena saw a thin trickle of water ooze from the sides of the ventilator. Then it became a steady stream, pouring from the gaping hole which suddenly appeared in the wall as the ventilator opened—wide. For a moment Austin seemed to stand stock-still, in mortal terror of the consequences of what he had done. Then he staggered back as the water gushed forth in a flood which swept him off his feet and slopped forward greedily to engulf her as she fell senseless to the floor.

ERIK GAZED through the control room window at the enveloping wall of murk as though the intentness of his scrutiny should penetrate its greyness and reveal the secrets he felt it must conceal. His mouth was firm as he fought to thrust down into the furthest recesses of memory the events which had occurred only a few hours before.

He remembered the glad relief on the faces of his fellows as he returned from the generating-room in the stern immediately following the announcement that

the air-feed was working again. He had shared their relief as the pressure built up, slowly but surely, removing the burden from aching lungs and dulled senses as the cooling draughts surged through the passages and compartments once more. It had required an almost incredible amount of skill and fortitude to get the repair job done at such speed, but Crossland and his assistant technicians had accomplished the impossible.

He instantly ordered them to their quarters for a well-deserved rest, and went back to the control-room, wondering how long it would be before the next stroke of ill-fortune put a further strain on their resources. Yet what could they expect, when the Ark had been built so hastily, with poor materials and little understanding of what they were doing? It was a miracle they had got so far . . .

The storm was at its height, the great waves thundering upon the Ark's tortured sides, when Crossland left his uneasy bed to relieve Erik at his post. On the way to the control-room he had to pass the door of the animals' quarters, and there he stopped in his tracks to stare disbelievingly. The door was firmly closed, but from all around it trickled a stream of water which had collected in the passage. Already several inches deep at the door's end, it swirled back and forth along the passage as far as the main corridor.

Shocked into action, Crossland burst in upon Erik. "Quick! We've sprung a leak—in the animals' compartment!"

Before he leapt from his seat, Erik pressed a button, and instantly the clangour of alarm bells sounded throughout the vessel. With Crossland, he ran out to the flooded passage.

The water was running across the main gangway into the opposite passage, now, as the vessel rolled gently in the swell. It was obvious that the flooded compartment had caused a pronounced tilt which the gyrostat could not entirely rectify, though it tended to keep the Ark on an even keel in spite of it, as far as the raging seas allowed. How much water had been shipped already they could not tell; but the doors of the main compartments had been made against such contingencies, and this one was standing up well beneath what was manifestly a considerable pressure from the other side.

Erik urged Crossland to activity. "Get everybody into the stern section and close the central door. Send one man here to watch with me until the storm abates. If there is any danger of this door giving way, we will join you immediately. There is nothing more we can do."

Crossland hesitated for an instant; then, seeing Erik's determined look, hurried to obey his orders without question. Erik waited while the sound of voices raised in questioning alarm echoed through the corridors, then died away as the occupants of the forward compartments were urged into the stern section. Soon the man who had volunteered to share his watch came hurrying along the gangway, and they settled down to their vigil.

Back and forth the water ran, collecting in a dark pool on one side as the source of the leak sank below the water-line, adding to the flood within the compartment, then rushing towards them as the vessel rolled over and more water oozed

through the metal door. With every roll the level of the water against the door grew almost imperceptibly higher, and the stream which flowed back along the passage crept further into the gangway. Frequently they inspected the inner walls of the compartments on either side of the flooded section, but the water did not penetrate—as yet. They could only wait—and hope . . .

Waiting, Erik had time to ponder, and to regret the loss of the animals; but it would only have endangered the lives of his human charges if they had made any attempt at rescue. It was fortunate that the leak had occurred here—if leak it was: he suspected it must be a fault in the ventilator which had caused the flooding—and that the heavy door had been firmly fastened. Now, all they could do was pray that it held and wait for the seas to calm sufficiently to let the water find its own level, then open the door and bale out what was left.

IF HE HAD only known what else floated there, beside the small, furry bodies of lifeless animals in their cages . . . Gazing into the dimness outside, Erik shuddered at the memory which rose before him.

His prayer had been answered. With remarkable suddenness the storm had subsided, leaving the Ark floating smoothly over the waves. Then the water-logged compartment was opened—to disclose the bloated corpse of Austin and the poor, drenched body of Elena. The flabby face of the fat man, more bloodless than ever, was a death mask of stark horror. But in the lovely features of Elena was a look of quiet content, as though she had embraced death gladly.

The white hand of Austin still clutched the iron bar. It was obvious to Crossland what had happened. His eyes glinted in a futile burst of fury as he examined the bruise on Elena's wrist. Austin, craven as ever, careless of the safety of his fellows, had gone to open the ventilator. Elena, suspecting his treachery, had followed and tried to dissuade him, and he had struck her down, only to be drowned in the flood he had created. Senseless, she had drowned with him.

It was close enough to the truth. To Erik, the shock of the tragic discovery had been too numbing for his mind to analyse it. When at length he had begun to appreciate its significance, he was inclined to blame himself for his attitude to Elena. She had been very young, the victim of a foolish infatuation. He had cared for her, but not as her heart demanded. Now she was gone. It was as if the righteousness of his action in saving her from the cataclysm had been disputed, since she was not of the Chosen. As for Austin, the justice of his end was abundantly clear.

With an effort, Erik turned his eyes away from the grey blanket outside, let them fall upon the instruments before him. Now, he mused, it was as had been planned. Fifty had been chosen; fifty remained. What would they make of life, given further opportunity? Whatever was in store, there would be ample for him to do.

His eyes, on the sounding-meter, suddenly conveyed a message to his clouded brain. Quickly he consulted the reading he had recorded only an hour before. It was unbelievable—that there should be land so close beneath the Ark's keel

after all those fathoms of water which it had registered for so long, day after endless day.

He looked up, and as his eyes widened his pulses responded until they were racing with the wonder of it. The surrounding murk was no longer grey; it was only a white mist through which a dark shape was emerging—and above it, high in the heavens, was a patch of dim blue sky!

The disturbance caused by the comet had cleared the atmosphere of the dust which had obscured the heavens for so long, sufficient to let a hint of sunlight through. The murk had been banished—they might see the Sun and the stars again! And the dark shape . . . it was clearer now, rising up from the rippling sea before him in a still distant but distinct outline.

With trembling hand he picked up the mouthpiece of the instrument with which he communicated with the engine-room. When Crossland answered, he spoke in a firm voice:

"Stand by! Land lies ahead!"

The Chosen had reached their new world.

THE END

2000 Years of Science Fiction

By GEOFFREY GILES

BEYOND TIME & SPACE, selected by August Derleth. Pellegrini & Cudahy, New York. $4.50c.

THE BIG BOOK OF SCIENCE FICTION, edited by Groff Conklin. Crown Publishers, New York, $3.00.

RALPH 124C 41+, by Hugo Gernsback. Fell, New York. $2.50c.

THE ORDINARY reader who stumbles on a current example of science fiction in book or magazine may be excused if he is instantly reminded of the immense contributions made by Jules Verne and H. G. Wells to the development of this literature. He may also, if he is old enough, recall the names of George Griffith, Grant Allen, M. P. Shiel, William Hope Hodgson, and a few other British writers who at the turn of the century applied their powers of imagination to producing stories of the future, of other worlds, of strange experiments and inventions. He should know Conan Doyle, Fowler Wright, C. S. Lewis, J. D. Beresford, Neil Bell, and other more recent contributors to the *genre*: and if he has missed Olaf Stapledon he has not yet experienced the finest of all contemporary science-fantasy.

Once he has encountered the field of American science fiction, the new reader may occupy himself with the outcome of some forty years' productivity by hundreds of lesser-known writers—apart from the late Mr. Burroughs—to the exclusion of all others. But there are many who have followed the specialist magazines for twenty years or more who are constantly discovering some piece of fantastic writing, even among the works of the most famous authors (e.g., Kipling, Beerbohm, Priestley,

Buchan), which they never expected to find; and the number of isolated specimens the eager collector may unearth in amassing a library of science-fantasy novels runs into the thousands*. They are often surprised, too, to find that the medium is a good deal older than they suspected; that the only copies of works by those who led the way for Verne and Wells, and for the American pioneer Poe, are generally locked away among the rarities of the museums.

It is only a few years since the first fairly comprehensive survey of this truly historic literature† started a feverish delving into its neglected highways and byways for further evidence of its ancient origins. There are few earnest students, now, to whom the names of Lucian, Campanella, de Bergerac, Holberg, and other early exponents of the space-travel and world-of-the-future themes, do not mean as much in perspective as those of Heinlein, van Vogt, Bradbury, and others of the strictly modern school of writers featured by the American magazines during the last ten years. Thanks to the resurrection of their works from a period which marks the beginning of the more intensive development of the form, a new generation of readers has also learned of an older school of American writers, near-contemporaries of Wells, whose stories, if not as streamlined as the present-day product, are still interesting: such as Frank R. Stockton, Fitz-James O'Brien, George Allen England, Garrett P. Serviss, and their fellow contributors to the periodicals which paved the way for *Amazing*, *Wonder* and *Astounding Stories*.

Although, until recently, he was more concerned with the non-scientific, shudder-inducing tale of the type for which Poe became famous, Mr. August Derleth's familiarity with the whole of imaginative fiction is well known to those who have sampled his excellent anthologies, which have brought back dozens of worth-while tales lying unheeded in musty files. His idea of digging back further to present a cross-section of ancient, not-so-ancient and ultra-modern examples in "A Compendium of Science Fiction Through the Ages" was an even better one, resulting in a capacious volume which serves to give the reader who is anxious to increase his knowledge and appreciation of the field a comprehensive picture of its development since the days of Plato's *Atlantis*. Presenting no less than thirty-four pieces by as many different authors, the majority of which are rare indeed whether ancient or modern, it forms an admirable corner-stone for any assembly of science-fantasy.

The really antique specimens of the *genre* are not everybody's meat, and cannot be digested without effort even by the most assiduous student. But if he will persevere with the more difficult extractions, he will find that the quaint Lunar creatures of Lucian's *True History* are not so far removed from the "BEMs" (Bug-Eyed Monsters) of some of the lustier tales of today, and that most of the scientific ingenuities contrived by much later writers were known to the founders of Salomon's House in Bacon's *The New Atlantis*. Even the abundant footnotes of Kepler's *Somnium* will provide him with food for reflection, if he will only be patient in pursuing the great astronomer's story of the voyage to Levania which is reputed to have inspired Wells' *The First Men in the Moon*. And Francis Godwin's classic *The Man in the Moone*, periphrastic though it is, seems clearly to have set a pattern for the interplanetary story which had not been entirely discarded after three centuries.

As one of the first literary critics to investigate the so-called phenomenon of modern science fiction, Mr. Groff Conklin has already been responsible for two bulky collections of stories culled almost entirely from the specialist pulps*. According to him, these were much better received by the reading public at large than even he expected. Now, in giving us his third and biggest volume, he pauses to take stock, and decides that "Good science fiction has ceased to be the property of a relatively

*_The Checklist of Fantastic Literature_ (Shasta, Chicago: '48), the first bibliography of fantasy-fiction, contains over 5,000 titles.

†_Pilgrims Through Space & Time_, by J. O. Bailey (Argus, New York: '47).

*_The Best of Science Fiction_ (Crown: '46); _A Treasury of Science Fiction_ (Crown: '48).

small group of enthusiasts and has graduated to the respectability of a large and ever-growing audience." As evidence he indicates the current glut of novels and anthologies, the inclusion of such stories in general magazines of large circulation, and the appearance of so many new publications devoted to a medium which not long since was "discredited and practically unknown."

He also decides that, contrary to the usual rule, its popularisation has brought an improvement in quality, though not as much as might be desired. While practised writers have been encouraged to produce better material for their enlarged audience, "most of the science fiction pulp magazines still print childish, badly written and mechanically contrived stories"—with the notable exception, as always, of *Astounding Science Fiction*, from which he extracted the vast bulk of his *Treasury* two years ago. Again, he has drawn generously on this magazine for such modernistic tales as Horace L. Gold's "A Matter of Form," Jerry Shelton's "Culture," and Clifford D. Simak's "Desertion"; like Mr. Derleth, he favours Theodore Sturgeon, Lewis Padgett, Fritz Leiber and Ray Bradbury. However, he concedes that other magazines do occasionally present worth-while material; and the rest of his thirty-two pieces have come from ten other pulps, apart from the old *All-Story* and the recently converted *Saturday Evening Post*.

He has also tried to give a show to some of the newer writers, such as Damon Knight, Katherine McLean, and the English Peter Phillips, as well as to favourites of twenty years ago like Miles J. Breuer, Morrison Colladay and G. Peyton Wertenbaker; not to mention the ever-green Murray Leinster, who can still keep pace with Eric Frank Russell, Fredric Brown, Noel Loomis, and the rest of to-day's popular exponents. In this up-to-the-minute assembly, the presence of Verne seems unwelcome, until we find that his contribution is quite unfamiliar—a prediction concerning the world "In the Year 2889" which appeared in a New York journal nearly sixty years ago and has never been reprinted until now. Surely none will begrudge him twelve of these 545 intriguing pages . . .

Both Dr. Lee de Forest, the radio pioneer, and Fletcher Pratt, the veteran science fiction writer, in their forewords to the new edition of Hugo Gernsback's "classic," are tempted to compare him with the immortal Jules. Indeed, Mr. Pratt thinks Gernsback much more entitled to rank as the originator of modern science fiction than either Verne or Wells, simply on the strength of the method he has employed in his writings: "that of supplying the people of the future with technical inventions which are the logical outgrowths of those currently in use or logically developed from currently accepted principles."

Those who know the part played by Mr. Gernsback in the specialisation of this medium, as the founder-editor of *Amazing Stories* and, later, of *Science Wonder Stories*,* will doubtless have heard of *Ralph 124C 41+*. Published originally in 1911-12 as a serial in *Modern Electrics*, the first radio magazine (also started by Mr. Gernsback), it told a simple story of adventure in the world of 2660. Though it had little literary merit—for which the author now excuses himself—it contained a wealth of prophetic detail concerning television, weather-control, solar power, space-flight and other matters which were soon to become stock in science-fantasy. It anticipated many of the gadgets which were to become actualities, such as the electro-encephalograph and fluorescent lighting, and included a surprisingly accurate working description of radar, which had not been remotely conceived until then.

Is it any wonder that Mr. Pratt writes so reverently of Mr. Gernsback's "educated imagination," in declaring his book one of historic importance, even if the author himself has been taken aback by the significance accorded to it—and by the prices which an earlier edition commanded amongst collectors? It may no longer be a museum-piece, and it still bears the marks of having been written to meet deadlines; but it will always be deserving of an honoured place in the archives of "Scientifiction."

*See "Pioneer of Scientifiction": *Science-Fantasy Review*, Spring '50.

Black-out

By

JOHN RUSSELL FEARN

If, one fine day, you saw the Sun fall out of the sky and all was dark but for the stars—stars you'd never seen before—would YOU know what might have happened?

Illustrated by Powell

THERE WAS something wrong out there in the depths of space; something so incredibly strange that the scientists who tried to examine the mystery found their accumulated centuries of knowledge faltering. It had begun with the amazing antics of the stars neighbouring on the Milky Way. Fixed apparently for eternities of time in their courses, arranged much as the ancients had seen them when they stared up at them uncomprehending, they had now completely changed position—and in some cases disappeared entirely. Sagittarius, Hercules, Antares, Cepheus—they were visibly shifting across the wastes of heaven, moving at such an unthinkable velocity that the minds of the watching astronomers reeled, used though they were to cosmic speeds. And the Milky Way itself was shifting, bearing towards the westernmost limb of the sky.

The amazing part of the phenomenon, apart from its very occurrence, was the suddenness with which it developed. On the night of July 7th the world's observatories had noticed nothing unusual. But on the 8th, between the hours of midnight and dawn, these fantastic perambulations of the stars were only too evident. Though it just couldn't be, because it shattered every basic law of astronomy. Yet it *was* . . . And from the space which the stars had deserted

gleamed new and unknown constellations, hosts of heaven that made complete chaos of the world's star-maps.

The astronomers immediately got in touch with one another and discussed the problem. All had to admit themselves baffled. But, hesitating to make the same admission to their respective governments, they agreed to make no announcement of their startling observations until they had been able to study the phenomenon further and consider the enigma in the light of additional data. Given time, they agreed, they might find something to account for it. And that is where they made their great mistake.

Earth, in her majestic million-miles-a-minute sweep through the universe, was moving irresistibly towards that part of the heavens whose aspects had changed so mysteriously. And, although at that time the fact could not be detected, the disturbance—the Fault—was also moving towards Earth at a similar speed . . .

So the whole of Earth's peoples were caught unaware by the Fault, the real nature of which is now common knowledge. The individual experiences of many thousands of people on that Black Saturday, as it has since become known, have likewise been retailed throughout the world. But there is one random experience, that of Robert Maitland and Irene Carr, which has not yet been recorded. In many ways it is typical of millions, and is therefore undistinguished. It is, however, notable in that these two ordinary people, caught in circumstances very similar to millions of others and equally mystified by them, were yet able to deduce for themselves the simple explanation of what had occurred—the explanation which eluded most of us until the astronomers, with all the data they needed, presented it to the wondering world.

Think back. Recall your own bafflement, your sense of utter helplessness, your *fear*, and you may grant the noteworthiness of this particular experience of two people who were no better equipped than millions of their kind to realise the nature of the apparent catastrophe which had overtaken them. Yet, amid all the acclamation we have accorded the astronomers, we have entirely overlooked the perseverance and good sense of those few who, like these two, refused to give way to despair until they had tried to work out the problem for themselves.

DR. ROBERT MAITLAND lived, at that time, in a small house in Windermere. His practice was small but full of promise: he was making a name for himself among the villagers and the rustic community of the Lake District. On the morning of July 8th he was awakened early by a telephone call. One of his patients, badly injured in a farming accident the day before, had taken a turn for the worse. In the chill of the summer dawn, Maitland listened to the high, tremulous voice of the stricken man's wife over the wire. He promised to be over right away, rubbed the sleep out of his eyes, and set about dressing hastily.

Robert Maitland was not the type that is addicted to nervous fancies. He

stood five feet ten, was solidly built, and his lean, swarthy face had strength and responsibility in every line. And yet—he was seeing things. Things that, in the urgency of his dressing and with the purpose of his errand uppermost in his thoughts, did not immediately absorb his attention, yet which vaguely puzzled him.

For instance, as he brushed his thick, dark hair hurriedly before the mirror, he could have sworn that his reflection moved very slightly from side to side. A measure might have shown at least an inch of movement, as if he were swaying on his feet, though he was certain he was standing perfectly still. Then, through his bedroom window, he could see across the rolling pastureland to the distant mountains grouped about Helvellyn; and as he looked it seemed that the mountains glided slowly sideways, then drifted back into their normal position.

There were no warps in the window glass; he was sure of that. The mirror, too, was a good one. Maitland closed his eyes tightly, opened them again, and decided that he felt well enough. It must be some slight liverishness, or perhaps it was just tiredness—he wasn't as completely awake yet as he'd thought. It would soon pass . . .

He was, of course, unaware that millions of people all over the world were trying to account for similar manifestations at that precise moment. Nor did he realise that the world's astronomers were even then busily communicating by cable and radio, seeking among themselves some clue to the peculiar phenomena they had observed. For it was then that the first tendrils of the Fault were creeping into Earth's boundaries while she swept on resistless with her load of puzzling humans.

Maitland left the house after scribbling a note to his housekeeper that he had gone on an urgent call. He hurried outside to the garage. It was getting warmer now. The Sun was struggling through the fast dispersing mists from the valleys and there was every sign that the day would be a perfect one. Then, on his way down the narrow drive leading to the garage, Maitland paused and rubbed his forehead as he stared bewildered before him.

The garage building straight ahead, with its bright green doors, was moving over to the right—soundlessly. The fence alongside it was moving, too ! This time there was no mistake about it. The garage shifted at least two feet and came to a halt. At the same time the gravel drive *bent* suddenly, at a spot immediately in front of Maitland, so that he had to take a distinct, sharp corner to continue towards the garage doors.

Uncertain, he went forward slowly, turning sharply to the right even though he knew it was an idiotic thing to do. How foolish it was he discovered when he felt himself stumbling over the edge of the drive on to the flower bed at the side—yet apparently he was still on the gravel pathway. Abruptly he realised that he was faced with the impossible. He seemed to be treading on something he could see only two feet away from him, yet he couldn't *feel* the thing his eyes told him he *was* treading on. Then, even as he wrestled silently with the

riddle, the garage and the drive moved back without a sound into their accustomed position—and Maitland stared open-mouthed, conscious of the fact that he was actually standing in the soil of the flower bed two feet away from the drive.

DELUSIONS ? Incipient insanity ? He considered both possibilities with a cold, professional detachment, but neither seemed to fit. This was something new, vitally different—and as yet beyond explanation. He stepped back gingerly on to the drive, found it solid enough, and went on to open the garage doors. To his relief, everything remained apparently normal as he backed the car out. He left it with the engine ticking over as he closed the doors. Then he clambered back into the driving seat and swerved out on to the road.

To the home of his patient was some twenty miles journey along valley roads, between lofty hills and through quaint old villages. He drove swiftly, but not so swiftly that he could not admire the beauty of the countryside as he went. The Sun now was high above the hills, blazing down with gathering heat, picturing itself in a myriad microscopic reflections from the dew-soaked grass and flowers bordering the road. As he drove on, Maitland forgot his strange visual aberration—until he was cruelly reminded of it.

He had climbed out of the depths of the valley where his home lay. To his right were towering hills with scrubby fields nestling at their bases; to his left was a smooth panorama stretching for fifteen miles across pastureland, tarns, and lush valley sides. Such was the aspect when the narrow road he was traversing bent suddenly, directly ahead of him—not normally, but as he approached it. Simultaneously, the grass bank at the side of the road shifted to accommodate the bend.

Maitland put on the brakes and came to a stop. He knew perfectly well that this road did *not* bend ahead of him: it went straight on towards Wilmington village. The only curve in it at all was a slight one about half a mile further on, where stood a lonely telephone box. If he went round this pseudo-curve now, he might run over the edge of the road and down the grass slope. No sense in risking that.

"Something's up !" he muttered, convinced at last that it was not his eyes nor his health that was at fault, but that something in the nature of a mirage—or a series of them—must have occurred in this locality; though what could have caused such a thing was beyond him. Finally, he got out of the car with the intention of studying this particular mirage more closely. But he took only three strides forward before he stopped, tottering dizzily in the middle of the road.

In that moment he was frightened, really scared, as he had never been before. For all of a sudden everything about him seemed to have gone completely crazy. The whole landscape as far as he could see was shifting violently. The fifteen-miles stretch of country before him was sweeping sideways at diabolical speed—shearing off to the west as a towering wall of blackness appeared to race in from the east, moving everything before it !

Maitland just stood and stared, petrified. There was no sound as the amazing thing occurred; only the titanic shadow which raced towards him with the speed of a total eclipse. Within a few seconds it passed over him, and the bent road ahead was blotted from sight. He stood, now, drenched in darkness, feeling no other sensation but a supreme dread.

It was several seconds before he could recover himself sufficiently to move, and then he began to retrace his steps slowly and cautiously towards the car, hands outstretched gropingly before him. Not a thing was visible—except the Sun, shining high in a sky still strangely blue ! Shining, yet failing to light anything . . .

Feeling his way forward, he came up against the bonnet of the car and clung to it gratefully. He couldn't see even the dimmest outline of the car itself. He stood and gazed up at the Sun, thankful that it, at least, held to normalcy . . . but this relief was soon denied. The Fault into which the Earth had plunged enveloped the Sun, too, within a few minutes. One moment it was there in the dark blue sky; the next, it had started to sink towards the western horizon with incredible speed. It dropped like a meteor, vanished in the all-enveloping blackness that formed the limits of the landscape, and was gone.

Now it was utterly dark. Dreadfully, horribly dark . . .

THE HUMAN mind, psychologists tell us, can absorb the most violent of shocks and still function. But it was a long time before Maitland found he could think intelligently, without letting blind panic scatter his half-formed thoughts. As he struggled to banish his primitive fears he searched the blackness around him, still clinging to the car bonnet, his only link with reality.

Here on the ground the darkness was absolute, and he could not discern the slightest hint of anything. But up in the sky from which the Sun had streaked, minutes before, there were now myriads of stars ! To Maitland, who had no precise astronomical knowledge, these stars looked normal enough, but an expert would have noticed at once that not many of them were familiar and that the few recognisable constellations were far away from their customary positions.

Night, when it should be 9 a.m. ? A Sun that disappeared from the sky in a flash ? This was a problem beyond all understanding. Yet Maitland knew the elementary fact that the sudden shifting of such a vast body as the Sun should cause cataclysmic disturbances, perhaps throw Earth right out of its orbit. And yet everything was quite steady, without even the suggestion of a tremor. This point resolved, he felt a little better. He was still alive, with his feet on solid ground. But he was submerged in the inexplicable——

He stopped suddenly, listening. There were sounds ahead of him. Uneasy feet shambling over the gravel of the road.

"Hullo there !" he called.

"Hullo !" It was a girl's voice that answered. It was shaken, yet somehow filled with unquenchable courage.

"I'm here," Maitland shouted. "Come towards my voice."

The halting steps advanced again, but nothing came out of the darkness. That was the queer thing. Though there were stars overhead, Earth lay in an abyss from which every spark of light had gone. Maitland groped with both hands as the footsteps came nearer.

"Thank heaven I've—found somebody," the girl faltered, close by his ear. "I was just wondering what to do. What's—what's *happened* ?"

"You're asking me !" he laughed. "I'm as bewildered—and probably as scared—as you. I—er—I'm Dr. Maitland, of Windermere," he said as the girl's outstretched hand gripped his arm.

"I'm Irene Carr." They clasped hands in the darkness. "This is the last day of my holiday—Last Day, indeed ! I was on a hike to Rydal Water when —it—happened. The—the Sun's gone out, hasn't it ? That's what it must mean ! I know scientists have said something like this would happen one day."

"Yes, but not like this !" Maitland protested. "That must be a slow process, over millions of years. This is something different—and quite sudden ! We had no warning . . ."

They were silent, oppressed by the unfathomable. Maitland found himself collected enough, now, to wonder with intense curiosity what the girl looked like. He was intrigued by her voice: it was slow and mellow with a slight Midlands accent, and he knew instinctively that she was young and possibly attractive. If only he could *see*.

"I know !" he said suddenly, and felt in his pocket for his cigarette lighter. He flicked it, but the flint made no sparks. Then he gave a yelp as, in feeling round the wick, he burned his fingers in invisible flame.

"It *is* working, then ?" Irene Carr whispered in wonder. "Yet we can't see it . . . Do you suppose we've—gone blind ?"

"With the stars visible up there ?"

"I hadn't noticed——" She gave a little gasp of surprise. "Yes, there *are* stars—billions of them. But no Sun——"

"And yet . . ." Maitland drew a deep breath and considered. "And yet," he went on, awed, "I can feel the Sun's heat on the back of my neck. Just as though it's still there."

The girl was silent as she evidently checked up on his extraordinary finding. He didn't know whether to believe it himself until she said simply:

"You're right. There *is* heat. I can feel it, too, on the backs of my hands. Yet there's no Sun !"

IT STRUCK Maitland what an impossible conversation they were keeping up. At the back of his mind, too, was the remembrance of a man who lay on a bed in the dark some ten miles away.

"I wonder if I can drive the car ?" he said abruptly. "Let's see what we can do. There *is* a car here, you know !" He thumped the bonnet with his fist.

"I'll take your word for it," the girl answered, still trying to sound calm.

Maitland took her arm and they moved cautiously together over the rough

surface of the roadway, felt their way round to the car door and clambered inside. Here, with the roof of the car shutting out the stars above, the darkness was crushing; it wasn't even possible to see the outlines of the windows. But by stooping they could see part of the starry sky through the glass, and Maitland thought he caught a brief glimpse of the girl's head silhouetted against the stars, though the outline was blurred and unreal. He pressed the self-starter, and the engine throbbed immediately—a good, wholesome sound in a world that no longer made sense. Then he switched on the headlamp, but not the remotest suggestion of light appeared.

"No good." He switched off. "Can't drive in this."

They both sat in silence for a while, listening to each other's breathing.

"You know," the girl said presently, "it's funny. I've read stories where this sort of thing happens, and everything turns out all right. But when it happens to *you*, when everything you've known and trusted lets you down and leaves you blind and bewildered, you just don't know what to do. I suppose," she went on musingly, her voice steadier as she got to grips with the problem, "that there *is* an answer ?"

"A scientist might have one," Maitland suggested. "I'm not a scientist; I'm a doctor."

"I'm a school teacher . . . But, look, we've both got a fair degree of intelligence. We can reason this thing out, can't we ?"

Maitland didn't answer. Thoughts were hurrying through his mind. Memory was at work, piecing together the incredible events of the morning. The mirror reflection that trembled; the garage that shifted position; the landscape that had been swept sideways by an advancing wall of darkness . . .

"All right, Miss Carr. We——"

"I'd rather you called me Irene. After all, we're in this together."

"Irene it is, then—and mine's Bob. As you say, here we are, two people without any specialised knowledge, but familiar with rudimentary facts. You will be especially, as a teacher. Now, if the Sun had really plunged into the deeper universe as it appeared to do, the Earth and all neighbouring planets would have been wiped out in the terrific gravitational change. But that hasn't happened. We are quite safe and undisturbed; the world still moves in its proper orbit. And that means that the Sun's dive into obscurity was a—a delusion."

"Yes," the girl said, pondering. "Yes, that's right."

"On top of that," he went on, "we can feel the heat of the Sun just as if it were still there. In fact, in this car it is getting uncomfortably warm, and only sunshine—or, rather, heat—can explain it. That shows that the Sun *is* still there, although we cannot see it. If it were something that had destroyed the Sun utterly, its light *and* heat would be gone and the Earth would grow cold as its stored warmth leaked out into space. That, again, is not happening. It is night, but as hot as any July day should be."

"And down here, on the Earth's surface," Irene supplemented, "no light

whatever will function. And the Sun went out of sight *after* light failed down here."

They considered this aspect of the problem for a while in silence. Then Maitland spoke again, his voice vibrant with discovery.

"Doesn't that seem to suggest something which first involved the Earth, and the Sun afterwards ? Supposing that idea is right: what can we deduce from it ? We know that what will bend visible light will not bend heat. Remember the old college experiment ? A prism of glass will bend light out of its normally straight path, but that same prism is opaque to heat, involving a totally different set of circumstances. To refract heat waves we would use a prism of rock salt, or something like that."

"Refraction," the girl repeated slowly. Her voice sharpened. "Refraction ! Dr. Maitland—Bob—do you think that could be the answer ? You know, like a spoon in a tumbler of water ? It looks sharply bent, but really it's not. Or like a mirage, which makes things appear miles away from where they really are!"

"A mirage—on a colossal scale—— Yes, I'd thought of something like that." Maitland began a meticulous searching of his mind, trying to remember all he had learned about light. "We know that we see objects because of the light emitted or reflected from them. Then, if by some fluke the light waves no longer travelled in straight lines, we would not see the object at which we looked."

"Right !" the girl agreed. "I know a few things about light, too. I've taught it in physics class. The first law of refraction is that the incident ray—the normal, straight one, that is—and the refracted ray both lie in one plane; and the second law is that a ray of light passing obliquely from a less dense to a more dense medium is bent towards the perpendicular at the point of incidence. Good heavens !" she went on rapidly. "It's beginning to make sense. Before this happened did it seem to you that things kept jumping out of place and back again ?"

"No doubt of it," Maitland declared, rather overcome by her growing control of the situation.

"Then doesn't it suggest that the Earth has come into contact with something—some region of space—that is a denser medium than usual, and because of it all light waves are bent to one side ? Something so enormous in extent that it involves the Sun and, maybe, the whole Solar System ? So, light waves don't move straight any more, but heat waves remain unaffected."

A SCIENTIST might have been very proud—or very jealous—of Irene Carr at that moment. Without any special qualifications, reasoning out the problem solely from elementary principles derived from her school-teaching, she had arrived at the amazing solution. Refraction—a gigantic mirage ! This was the theory which was being discussed at that very moment by scientists all over the world, by long distance telephone and radio. Light alone was affected: that was the cardinal point. Every other kind of radiation was normal.

Something, somehow, was bending light waves out of the straight line.

"But—but the stars !" Maitland exclaimed. "We can see them perfectly !"

They lowered the car windows and looked outside. The darkness was so intense that it made their eyes ache. It was a relief to gaze up to where the sky was still dusted with the multi-millions of stars that had sprung into being at the start of the mystery. Maitland and the girl were quiet for a long time, two puny mortals grappling with an infinite problem in a lightless world. Then Irene spoke again.

"Where," she asked, "is the Milky Way ? My astronomy isn't so good, but I do know that smudgy band like curdled milk. And it just isn't there any more."

She was right. That swirling galaxy from which the Earth itself had been born was not visible. Neither, if it came to that, were Sirius, Procyon, Pollux or Betelgeuse, though neither she nor Maitland knew enough to be aware of it. And the Pole Star, famous since time began——

"No Pole Star !" Maitland said, astounded.

Impressed by this new discovery, they clambered out of the car and stood holding on to it as though it were their last material support in a world doomed to everlasting dark. Soft wind, warm and summery, stirred the invisible grass at the side of the road.

"Do you suppose," Irene said, stumbling round to where Maitland was standing, "that the thing which is warping light waves is causing us to see stars which ordinarily we wouldn't see ? That mirage again ?"

"You mean stars beyond our normal range of vision ?"

"Yes. Why not ? Space is a big place. There are countless trillions of stars we never see in the ordinary way. But if the light from them were bent enormously out of focus we would see them—*are* seeing them now. By the same token, at some distant point from Earth our Sun is probably visible—and the Milky Way. Maybe the inhabitants of an unknown world are wondering at this moment how the unknown sun and galaxy got into their sky and where *their* usual stars have gone !"

"Yes," Maitland whispered. "By heaven—yes ! A huge light-wave warp, bending everything light-years out of its usual track. I don't know how you worked it out, but it's the only possible explanation. It just *has* to be right !"

"After all," she went on, more confidently, "refraction has no definite limits: a mirage can take place within a few feet of the observer or cover dozens of miles. In this case, light waves may be bent millions of miles out of——" She gave a little gasp as a new thought struck her. "Of course ! Remember how the Sun appeared to streak towards the west, and then disappeared ? That must have been when the thing came between us and the Sun. It wasn't the Sun itself that skidded sideways; it was his lightwaves. He's still there !" She stared blindly upwards.

"At least," Maitland said uneasily, "we won't freeze ! But this is all so impossible—a world where no light will operate. I wonder what's going on in

the cities—out on the oceans—in the air? I never stopped to think about it until now."

Neither of them dared to voice the thoughts that were in both their minds. In any case, the rest of the world was far away, remote. Maitland reached out and caught the girl's arm.

"Let's sit on the grass bank. Too oppressive in the car . . ."

HOLDING ON to each other, they scuffed their feet over the gravel to the side of the lane, groped for the grassy bank and settled down on it, staring into the black void. They gazed anew at the unfamiliar stars which gave no light down here, because once their light waves reached an object they had become so completely refracted that it was not visible at all. Every object on the surface of the Earth was affected in the same way. The area of refraction was so vast that any image-reflection veered right off the Earth itself into surrounding space.

It was quiet, too. Only the wind out of the blackness, gentle, caressing, like a comforting hand in deepest sorrow. No birds, no sounds of country life. No friendly voices of other human beings. . . .

"Suppose," Irene whispered, "it goes on—and *on*?"

It was the human being in her that was speaking now. Cold logic had given way before natural emotion—before fear.

"It will be the end, I suppose," Maitland said soberly. "The end of the

world. Without the Sun, Man couldn't survive."

"But we've *got* the Sun," she insisted. "It's there—warming us. It's the absence of light that's the problem. If we could only get over that—— We might, underground. Maybe this thing the Earth has run into won't act below the surface. We might live down there, like—like Morlocks."

"If it goes on," Maitland said slowly, "it'll mean the end of vegetation as we know it; the end of staple crops, of everything that relies on photosynthesis. A new species of fungoid plants might come into being——"

"And yet, on the surface, we'll still get sunburned, because the ultra-violet rays are unaffected."

The whole crazy paradox quenched their conversation then. Though neither of them would admit it, even to themselves, deep down inside of them they felt a grim fear. The inborn instinct of the primitive, handed down through unguessable ages, was not to be set aside without a struggle. Darkness was ever to be dreaded . . .

"It's odd, in the midst of this," Maitland said at length, "but I keep wondering what you look like."

The girl's laugh sounded soft and ghostly in the blackness. "If this ever goes, you'll see," she murmured. "But you might be disappointed."

Maitland smiled bitterly to himself. If this goes—— ! She was fearing, even as he was, that it might never go. Earth had, perhaps, plunged for ever into an area of refraction where all light was dead.

"Wish I knew the time," he growled, raising his wrist watch and staring into the blackness. Then an idea struck him. He felt for his penknife and, after a moment's fumbling, prised open the watch and felt gently for the hands.

"Ten to twelve." He whistled. "Nearly noon. Who'd imagine it ?"

"Where were you going when this happened ?" the girl inquired.

"I was going to see a patient . . . Look, there's a telephone box about half a mile down the road. I think I ought to try and reach it and give his wife a ring. This might go on all day. Do you want to stay here or——"

"Not likely !"

She grasped his hand and he helped her to her feet. Linking arms, they began to walk unsteadily down the lane, feeling before them at every yard. It was hard going, and they could not immediately rid themselves of the impression that they had been suddenly blinded in a world that was normal for everyone but themselves. Instinctively they kept listening for onrushing cars, until gradually they realised how unnecessary it was. Everything was blotted out completely, just as they were. For once Nature had the complete upper hand of her erring, quarrelsome children.

"Half a mile," Irene said as they shuffled along. "That's a long way, in this. How will you know when we get there ?"

"It's just in a slight bend of the road. We'll do our best, anyway. It's better than sitting still waiting and wondering how it's all going to end. Sooner or later we should get to Wilmington village. We'll need food—I haven't had my

breakfast yet !"

"And I've nothing with me," the girl sighed. "I was planning to eat at roadhouses on the way . . . Well, let's hope it will pass soon."

IN TRUTH, nobody knew when it would pass; not even the scientists who were engrossed in the phenomenon. In totally dark observatories the world over, they were still discussing it with each other across land and sea, exchanging reports and impressions. Caught unawares by the terrific speed with which the Fault had developed, they had had no time to estimate its area. It might be untold light-centuries in extent, in which case Earth would not swim clear of it for hundreds of years. If, on the other hand, it was a mere patch as cosmic distances are reckoned, it would soon be left behind.

On one thing they were all agreed: something in the ether—they freely admitted they did not know what—was altering the incident rays of light so tremendously that laws presumed immutable had been completely revoked. The *something* must be a medium that was transparent to heat yet highly refractive to light; perhaps a semi-gaseous envelope, non-poisonous, created in the first instance by the explosion of a long extinct sun. This theory was extended tentatively, and for the time being it had to suffice. To a race which does not yet know exactly what the ether is, there is no shame in not understanding the real nature of the Fault. It may be centuries before we shall know the truth . . .

"I think," Maitland said, "the phone box is just a few yards further on, to our left."

He and the girl had come to the slight bend in the road: they could sense it with their feet as they advanced. Carefully they edged their way along, groping in the dark as they went. For a while they encountered the wire fence at the side of the road. Then suddenly they blundered into hard glass and steel.

"It's it !" cried Irene.

Maitland tugged the door open, groped for the instrument and lifted the receiver. He was thankful that this district still did not use the dialling system. Wondering if he would get a reply, he put the receiver to his ear.

"Hello !" came a girl's voice, quite composed.

"Er—can you get me Wilmington Seven Nine ?" Maitland asked.

"I'll try, sir. I suppose you can't tell me your number ?"

"Impossible. I'm in total darkness. How is it where you are ?"

"Well, they tell me it's blacker than midnight," the girl answered. "I wouldn't know, though. I'm one of the war-blinded, trained as a telephone operator. They've called me out on emergency duty . . . Wilmington Seven Nine. Just a moment——" Then: "Insert two pennies, please !"

Maitland fumbled with the coins. There was the friendly buzzing of the ringing tone as he waited in the darkness. He could hear Irene Carr breathing gently beside him as she stood wedged invisibly between door and frame.

"Hello !" came a thin voice in the receiver. Maitland pressed Button A.

"That Mrs. Andrew ?" he asked quickly. "Dr. Maitland speaking."

"Oh, thank God to hear another voice, doctor !" cried the woman, fervently. "What in heaven's name has happened to the world ? Is—is it the Judgment Day at last ?"

"I wouldn't know, Mrs. Andrews—but I agree it's pretty ghastly. I'd like to know how your husband is. I'm stranded some ten miles from your place——"

"You don't need to rush yourself, doctor." The voice was strangely calm, now. "Something's happened to my husband that I don't rightly understand. When everything went dark he just lay abed and said something about he knew God was everywhere. Then he said he'd never thought about God while life went by, day after day, like clockwork. But now everything's still and dark and quiet, he says he can feel God near him. That's the truth, doctor. And he's goin' to be all right, I'm sure of it ! He's sleeping quite peaceful, now."

"Well—that's fine," Maitland said. "I'll come and look at him the moment the darkness passes."

He put the telephone back, brushed Irene's shoulder as he grasped the door. She stepped out into the road, and they stood side by side in the stygian gloom.

"Everything all right ?" she inquired.

He told her what Mrs. Andrews had said. "He seems to have made a remarkable recovery—at least for the present. I'll have to see him when I can."

"I think I can understand it," she mused. "Normally, when we're healthy and active, we're inclined to take a lot for granted, just as we took the smooth working of the universe for granted—until now. It's only at times like these, when everything goes out of gear, that we have to stop and think about such things. And when we find ourselves out of our depth, unable to make sense of what has happened, there's nothing left to lean on but the Almighty."

Maitland remained silent, holding Irene's arm. Sensing her nearness, he found himself longing more than ever to see what kind of girl this was who had such a simple solution for everything that baffled him. He turned aside and, just for a moment, he fancied he *could* see her. There was the faintest suggestion of a rounded chin, a straight nose, dimly outlined against the blackness beyond. Yes, and a slender figure . . .

While he stared disbelievingly, the silhouette took on depth. He saw the glint of light creep into hair of copper brown; and then she came out of the abyss like a vision, staring back at him with wide blue eyes that began to narrow beneath the impact of returning sunshine. Around her the landscape came gradually into view, as though floodlights were being turned on, slowly——

"Great God !" he whispered, and jerked his gaze upward. Then they both fell back, hands over their faces, as the stars paled out of the sky before an advancing tide of ever-deepening grey. Grey which merged into white, into blue. Then, blinding in its intensity, the Sun rose suddenly from the west where it had disappeared, and came to a stop at the zenith.

It was high noon. The Earth had swept clear of the Fault.

THE END

Silence, Please!

By CHARLES WILLIS

A gadget that walled you off from sounds you didn't want to hear, at the touch of a switch? There'd be a fortune in it for any inventor! Yet this one sold the patents to his hated rival . . .

Illustrated by Powell

NOW THAT you point it out, it *is* rather extraordinary how the Professor's enemies always seem to get the worst of it. But I think your insinuation is a little unfair, He's really a very kindhearted chap who wouldn't hurt a fly if he could help it. I'm not saying that he doesn't like a scrap, but it's always fair and above board. Well, nearly always. Perhaps that *was* an exception. And you must admit that Sir Roderick deserved all he got.

When I first met the Professor he had only just left Cambridge and was still struggling to keep the Company solvent. I think he sometimes regretted leaving the academic cloisters for the rough and tumble of industry, but he once told me that he enjoyed using the whole of his mind for the first time in his life. Electron Products (1960) Ltd. was just about covering its expenses when I first joined it. Our main line of business was the Harvey Integrator, that compact little electronic calculator which could do almost everything a differential analyser could for about a tenth of the cost. It had a steady sale to universities and research organisations, and is still the Professor's favourite. He's always improving it, and Model 15 goes on the market in a few weeks.

At that time, however, the Professor had only two assets. One was the goodwill of the academic world, which thought him crazy but secretly admired his courage; his old colleagues back at the Cavendish were always boosting his products, and he got quite a bit of useful research done for nothing. His other asset was the mental outlook of the business men he dealt with. They took it for

granted that an ex-university professor would be as innocent of commercial guile as a new-born babe. Which, of course, was just what the Professor wanted them to think. And some of the poor innocents still cling pathetically to that theory.

It was over the Harvey Integrator that Sir Roderick Fenton and the Professor first came into conflict. Perhaps you've never met Dr. Harvey, but he is that rare creature, the perfect popular conception of a scientist. A genius, of course, but the sort that should be locked in his lab. and spoon-fed through a trapdoor. Sir Roderick did a flourishing line of business with helpless scientists like Harvey. When State control put an end to most of his other rackets, he turned his hand to the encouragement of original inventions. The Private Enterprise (Limitations) Act of 1955 had tried to foster that sort of thing, but not in the way Sir Roderick intended. He took advantage of the tax exemptions and, at the same time, held industry up to ransom by grabbing fundamental patents from dim-witted inventors like Harvey. Someone once called him a scientific highwayman, which is a pretty good description.

When Harvey sold us the rights to his calculator he retired to his private lab. and we didn't hear anything from him until about a year later. Then he produced a paper in the *Philosophical Magazine* describing that really marvellous circuit for evaluating multiple integrals. The Professor didn't see it for a few weeks—Harvey, of course, never thought of mentioning it, now being busy on something else. The delay was fatal. One of Sir Roderick's snoopers (he paid for and got good technical advice) had bullied poor Harvey into selling the thing outright to Fenton Enterprises.

The Professor, naturally, was hopping mad. Harvey was frightfully contrite when he realised what he'd done, and promised never to sign anything again before consulting us. But meanwhile the damage had been done and Sir Roderick was clutching his ill-gotten gains, waiting for us to approach him as he knew we must.

I'd have given a lot to be present at that interview. Unfortunately, the Professor insisted on going alone. He came back about an hour later, looking very hot and bothered. The old shark had asked £5,000 for Harvey's patents, which was just a little less than our overdraft at that time. We gathered that the Professor's leave-taking had been lacking in courtesy. He had, in fact, told Sir Roderick to go to Hell and sketched out his probable itinerary.

THE PROFESSOR disappeared into his office, and we heard him crashing around for a minute. Then he came out with his hat and coat.

"I'm suffocating here," he said. "Let's get away from town. Miss Simmons can look after things. Come along!"

We were used to the Professor's ways by now. Once we'd thought them eccentric, but by this time we knew better. At moments of crisis, a dash out into the country could often work wonders and more than repay for any time lost at the office. Besides, it was a lovely afternoon in late summer.

The Professor drove the big Alvis—his one extravagance, and a necessary one—out along the new Great West Road until we had passed the city limits. Then he opened the rotors and we climbed into the sky until a hundred miles of English countryside lay spread below. Far beneath us we could see the white runways of Heathrow, a great three-hundred-ton liner dropping towards them with idle jets.

"Where shall we go?" asked George Anderson, who was Managing Director at that time. Paul Hargreaves was the other member of the party: you won't know him, as he went to Westinghouse a couple of years ago. He was a production engineer, and one of the best. He had to be, to keep up with the Professor.

"What about Oxford?" I suggested. "It makes a change from these synthetic satellite towns."

So Oxford it was; but before we got there the Professor spotted some nice-looking hills and changed his mind. We windmilled down on a flat expanse of heather overlooking a long valley. It seemed as if it had been part of a large private estate in the days when there were such things. It was extremely hot, and we climbed out of the machine throwing surplus clothes in all directions. The Professor spread his coat delicately across the heather and curled himself up on it.

"Don't wake me until tea-time," he instructed. Five minutes later he was fast asleep.

We talked quietly for a while, glancing at him from time to time to make sure we didn't disturb him. He looked oddly young when his face was relaxed in sleep. It was difficult to realise that behind that placid mask a score of complicated schemes was being evolved—not least, the downfall of Sir Roderick Fenton.

At length we must have all dozed off. It was one of those afternoons when even the noise of insects seems subdued. The heat was almost visible, and the hills were shimmering all around us.

I woke up with a giant shouting in my ear. For a while I lay, taking a poor view of the disturbance; then the others stirred too, and we all looked round angrily.

Two miles away, a helicopter was floating above a small village that sprawled across the far end of the valley. It was bombarding the defenceless inhabitants with election propaganda, and every few minutes some vagary of the wind brought bursts of speech to our ears. We lay for a while trying to determine which party had committed the outrage, but as the amplifiers were doing nothing but extol the virtues of one Mr. Snooks we were none the wiser.

"He wouldn't get my vote," said Paul angrily. "Downright bad manners! The fellow must be a Socialist."

He dodged Anderson's shoe just in time.

"Maybe the villagers have asked him to address them," I said, not very convincingly, in an attempt to restore peace.

"I doubt it," said Paul. "But it's the principle of the thing I'm objecting to.

It's—it's an invasion of privacy. Like signwriting in the sky."

"I don't call the sky very private," said George. "But I see what you mean."

I forget exactly how the argument went from then on, but eventually it veered round to a discussion of offensive noises in general and Mr. Snooks in particular. Paul and George were regarding the helicopter dispassionately when the latter remarked:

"What I'd like is to be able to put up a sort of sound barrier whenever I wished. I always thought Samuel Butler's ear-flaps a good idea, only they couldn't have been very efficient."

"I think they were, socially," replied Paul. "Even the worst bore would get a bit discouraged if you ostentatiously inserted a pair of ear-plugs every time he approached. But the idea of a sound barrier is intriguing. It's a pity it can't be done without removing the air, which wouldn't be very practicable."

The Professor hadn't taken any part in the conversation; in fact, he seemed to be asleep again. Presently he gave a great yawn and rose to his feet.

"Time for tea," he said. "Let's go to Max's. Your turn to pay, Fred."

ABOUT a month later, the Professor called me into his office. As I was his publicity agent and general go-between, he usually tried his new ideas on me to see if I understood them and thought they were any use. Hargreaves and I acted as ballast to keep the Professor down to earth. We didn't always succeed.

"Fred," he began, "do you remember what George said the other day about a sound barrier?"

I had to think for a moment before it came back to me. "Oh, yes—a crazy idea. Surely you aren't thinking about it seriously?"

"Hmm. What do you know about wave interference?"

"Not much. You tell me."

"Suppose you have a train of waves—a peak here, a trough there, and so on. Then you take another train of waves and superimpose the two. What would you get?"

"Well, it depends on how you do it, I imagine."

"Precisely. Suppose you arranged it so that the trough of one wave coincided with the peak of the other, and so on all along the train."

"Then you'd get complete cancellation—nothing at all. Good heavens—!"

"Exactly. Now let's say we've got a source of sound. I put a microphone near it and feed the output to what we'll call an inverting amplifier. That drives a loudspeaker, and the whole thing is arranged so that the output is kept automatically at the same amplitude as the input, only out of phase with it. What's the net result?"

"It doesn't seem reasonable . . . but in theory it should give complete silence. There must be a catch somewhere."

"Where? It's only the principle of negative feed-back, which has been used in radio for years to get rid of things you don't want."

"Yes, I know. But sound doesn't consist of peaks and troughs, like the waves on the sea. It's a series of compressions and rarefactions in the atmosphere, isn't it?"

"True. But that doesn't affect the principle in the slightest."

"I still don't believe it would work. There must be some point you have . . ."

And then a most extraordinary thing happened. I was still talking, but I couldn't hear myself. The room had become suddenly very quiet. Before my eyes, the Professor picked up a heavy paperweight and dropped it on his desk. It hit and bounced—in complete silence. Then he moved his hand, and abruptly sound came flooding back into the room.

I sat down heavily, stunned for a moment.

"I don't believe it!"

"Too bad. Like another demonstration?"

"No! It gives me the creeps! Where have you hidden it?"

The Professor grinned, and pulled out one of the drawers of his desk. Inside was a shocking jumble of components. I could tell by the blobs of solder, the wires twisted together and the general untidiness that the Professor had made it with his own hands. The circuit itself appeared fairly simple; certainly not as complex as a modern radio.

"The loudspeaker—if you can call it that—is hidden behind the curtains over there. However, there's no reason why the whole thing shouldn't be quite compact, even portable."

"What sort of range has it got? I mean, there must be a limit to the infernal thing."

The Professor indicated what appeared to be a normal volume control.

"I haven't made very extensive tests, but this unit can be adjusted to give almost complete silence over a radius of twenty feet. Outside that, sounds are deadened for another thirty feet, and further away everything is normal again. You could cover any area you liked simply by increasing the power. This unit has an output of about three watts of 'negative sound', and it couldn't handle *very* intense noises. But I think I could make a model to blank out the Albert Hall if I wanted to—though I might draw the line at Wembley Stadium."

"Well, now that you've made the thing, what do you intend to do with it?"

The Professor smiled sweetly. "That's *your* job: I'm only an impractical scientist. It seems to me that it should have quite a lot of applications. But don't tell anyone about it; I want to keep it as a surprise."

I WAS USED to this sort of thing and gave the Professor his report a few days later. I had been into the production side with Hargreaves, and it seemed a simple job to make the equipment. All the parts were standard: even the amplifier-inverter was nothing very mysterious when you'd seen how it was done. It was not very difficult to visualise all sorts of uses for the invention, and I'd really let myself go. In its way, it was the cleverest thing the Professor had done. I was sure the company could make it into a profitable line of business.

The Professor read my report carefully. He seemed a bit doubtful on one or two points.

"I don't see how we can produce the Silencer at present," he said, christening it for the first time. "We haven't the plant or the staff, and I want money on the nail, not in a year's time. Fenton rang up yesterday to say that he'd found a purchaser for Harvey's patents. I don't believe him, but he may be telling the truth. The Integrator is a bigger thing than this."

I was disappointed. "We might sell the licence to one of the big radio firms."

"Yes; perhaps that's the best plan. But there are one or two other points to consider. I think I'll take a trip to Oxford."

"Why Oxford?"

"Oh, not all the brains are at Cambridge, you know. There's a bit of an overflow."

We didn't see him again for three days. When he came back he seemed rather pleased with himself. We soon found out why. In his pocket he had a cheque for £10,000 made out to R. H. Harvey and endorsed to Electron Products. It was signed Roderick Fenton.

The Professor sat quietly at his desk while we raved at him. Anderson was maddest of all. After all, he *was* supposed to be Managing Director. But the thing that rankled most was the fact that Sir Roderick had bought the Silencer. We couldn't get over that.

The Professor still seemed quite happy, and waited until we'd exhausted ourselves. It seemed that he had got Harvey to sell Fenton the Silencer as his own invention, so that its true origin would be concealed. The financier had been greatly impressed by the device and had bought it outright. If the Professor wanted to keep out of the transaction, he couldn't have chosen a better intermediary than the guileless Dr. Harvey. He was the last person anyone would suspect.

"But why have you let it go to that old crook?" we wailed. "Even if he's paid a fair price, which is incredible, why couldn't you sell it to someone honest?"

"Never mind," said the Professor, fanning himself with the cheque. "We can't quibble at £10,000 for a month's work, can we? Now I can buy Harvey's patents and make my bankers happy at the same time."

That was all we could get out of him. We left in a state of incipient mutiny, and it was just as well that the new calculator occupied all our attention for the next few weeks. Sir Roderick had handed over the precious patents without any more fuss. He was probably still feeling pleased with his new toy.

The Fenton Silencer came on the market with a great flourish of publicity, about six months later. It created quite a sensation. The first production model was presented to the British Museum Reading Room, and the fame it brought was well worth the cost of installation. While hospitals rushed to order units, we went around in a state of suppressed gloom, looking reproachfully at the Professor. He didn't seem to mind.

I DON'T KNOW why Sir Roderick brought out the portable silencer. I rather think that some interested person must have suggested the idea to him. It was a clever little gadget, designed to look like a personal radio, and at first it sold on novelty value alone. Then people began to find it useful in noisy surroundings. And then—

Quite by chance, I was at that opening performance of Edward England's sensational new opera. Not that I'm particularly keen on opera, but a friend had a spare ticket and it promised to be entertaining. It was.

The papers had been talking about the opera for weeks before, particularly the daring use of electric percussion instruments. England's music had been causing controversy for years. His supporters and detractors almost had a free fight before the performance, but that was nothing unusual. The Sadler's Wells management had thoughtfully arranged to have special police standing by, and there were only a few boos and catcalls when the curtain went up.

In case you don't know the opera, it's one of the stark, realistic type so popular nowadays. The period is the late Victorian era, and the main characters are

Sarah Stampe, the passionate postmistress, Walter Partridge, the saturnine gamekeeper, and the squire's son, whose name I forget. It's the old story of the eternal triangle, complicated by the villagers' resentment of change—in this case, the new telegraph system which the local crones predict will do things to cows' milk and cause trouble at lambing time.

I know it sounds rather involved and improbable, but operas always seem to be that way. Anyhow, there is the usual drama of jealousy. The squire's son doesn't want to marry into the Post Office, and the gamekeeper, maddened by his rejection, plots his revenge. The tragedy rises to its dreadful climax when poor Sarah, strangled with parcel tape, is found hidden in a mail bag in the Dead Letter Department. The villagers hang Partridge from the nearest telegraph pole, much to the annoyance of the linesmen; the squire's son takes to drink, or the Colonies, and that's that.

I knew I was in for it when the overture started. Maybe I'm old-fashioned, but somehow this modern stuff leaves me cold. I like something with melody, and nobody seems to write that sort of music any more. I've no patience with these modern composers—give me Bliss, Walton, Stravinsky and the other old-timers any day.

The cacophony died away amid cheers and catcalls, and the curtain went up. The scene was the village square at Doddering Sloughleigh, circa 1860. Enter the heroine, reading the postcards in the morning's mail. She comes across a letter addressed to the young squire and promptly bursts into song.

Sarah's opening aria wasn't quite as bad as the overture, but it was grim enough. Judging by appearances, it must have been almost as painful to sing as to listen to. But we were only to hear the first few bars, for suddenly that familiar blanket of silence descended upon the opera house. For a moment I must have been the only person in that huge audience who realised what had happened. Everyone seemed frozen in their seats, while the singer's lips went on moving soundlessly. Then she, too, realised the truth. Her mouth opened in what would have been a piercing scream in any other circumstances, and she fled into the wings amid a shower of postcards.

I'm sorry to say that I laughed myself sick during the next ten minutes. The chaos was unbelievable. Quite a number of people must have realised what had happened, and they were trying to explain it to their friends. But, of course, they couldn't, and their efforts to do so were incredibly funny. Presently pieces of paper began circulating, and everybody started to look suspiciously at everybody else. However, the culprit must have been well concealed, for he was never discovered.

What's that? Yes, I suppose it's possible. No one would think of suspecting the orchestra. That would account for the motive, too: I'd never thought of it before. Anyway, the next day all the papers were very rude about Sir Roderick and there was talk of an inquiry. Shares in Fenton Enterprises began to be unpopular. And the Professor looked more cheerful than he'd done for days.

The Sadler's Wells affair started a whole crop of similar incidents, none on such

a large scale but all with their amusing points. Some of the perpetrators were caught, and then, to everybody's consternation, it was discovered that there was no law under which they could be charged. It was while the Lord Chancellor was trying to stretch the Witchcraft Act to cover the case that the second big scandal occurred.

I used to have the copy of Hansard around, but someone seems to have pinched it. I rather suspect the Professor. Do you remember that deplorable affair? The House was debating the Civil Estimates, and tempers had risen to boiling point. A backbencher had attacked the Government in no uncertain terms, and the Chancellor of the Exchequer was hitting back with both fists when he was suddenly faded out. It was Sadler's Wells all over again, except that this time everybody knew what had happened.

There was a soundless pandemonium. Every time an opposition speaker rose the field was switched off, and so the debate became somewhat one-sided. Suspicion focused on an unfortunate Liberal who happened to be carrying a personal radio. He was practically lynched, while silently protesting his innocence. The radio was torn away—but the silences continued. The Speaker rose to intervene, and *he* got suppressed. That was the last straw, and he walked out of the House, ending the debate among scenes of unprecedented disorder.

SIR RODERICK must have been feeling pretty unhappy by then. Everyone was getting very annoyed with the Silencer, to which his name had been irrevocably welded by his own conceit. But, so far, nothing really serious had happened. So far . . .

Some time before, Dr. Harvey had called on us with the news that Fenton wanted him to design a special high-powered unit for a private order. The Professor did so—for a pretty stiff fee. I was always rather surprised that Harvey carried off the deception so successfully, but Sir Roderick never suspected anything. He got his super-silencer, Harvey got the credit, and the Professor got the cash. Everyone was satisfied—including the customer. For, about two days after the House of Commons incident, there was a robbery at a Hatton Garden jeweller's, early one afternoon in broad daylight. The extraordinary thing about it was that a safe had been blown open without anyone hearing *either the intruders or the explosion.*

Precisely! That's what Scotland Yard thought, and it was about then that Sir Roderick began to wish he'd never even heard of the Silencer. Of course, he was able to prove that he had no idea of the use for which the special unit had been intended. And, equally of course, the customer's address had been an accommodation one.

The next day half the newspapers carried headlines: FENTON SILENCER MAY BE BANNED. Their unanimity would have been puzzling if one didn't know that the Professor had long ago established excellent relations with all the science reporters in Fleet Street. By another strange coincidence, that same day an agent from an American firm called on Sir Roderick and offered to buy the

Silencer outright. The agent called just as the detectives were leaving and Sir Roderick's resistance was at its lowest ebb. He got the patents for $20,000, and I think the financier was glad to see the back of them.

The Professor, at any rate, was very cheerful when he called us into his office the next day.

"I'm afraid I owe you all an apology," he said. "I know how you felt when I sold the Silencer. However, we've got it back again, and I think everything's worked out rather well. Except for Sir Roderick, bless his little heart."

"Don't look so smug," said Paul. "You were just darned lucky, that's all."

The Professor looked hurt. "I admit there was a certain element of luck," he agreed. "But not as much as you may think. D'you remember my trip to Oxford after I got Fred's report?"

"Yes. What about it?"

"Well, I went to see Professor Wilson, the psychologist. Do you know anything about his work?"

"Not much."

"I suppose not; he hasn't published his conclusions yet. But he's developed what he calls the mathematics of social psychology. It's all frightfully involved, but he claims to be able to express the properties of any society in the form of a square matrix of about a hundred columns. If you want to know what will happen to that society when you do anything to it—for example, if you pass a new law—you have to multiply by another matrix. Get the idea?"

"Vaguely."

"Naturally, the results are purely statistical. It's a matter of probabilities—like life insurance—rather than certainties. I had my doubts about the Silencer right at the beginning, and wondered what would happen if its use were unrestricted. Wilson told me; not in detail, of course, but in general outline. He predicted that if as many as point one per cent. of the population used Silencers, they would probably have to be banned inside a year. And if criminal elements started to use them, trouble would arise even sooner."

"Professor! Are you telling us—?"

"Good gracious, no! I don't go in for burglary. That *was* a bit of luck, though it was bound to happen sooner or later. I am only surprised that it took so long for someone to think of it."

We regarded him speechlessly.

"What else was I to do? I wanted the Silencer *and* the money. I took a risk, and it came off."

"I still think you're a crook," said Paul. "But what do you intend to do with the thing now that you've got it back?"

"Well, we'll have to wait until the unpleasantness dies down. From what I've seen of Fenton Enterprises equipment, the units they've sold will come in for repair in about a year, so that should get rid of them eventually. In the meantime, we'll get our models ready for the market—fixed, built-in units only this time,

[*Continued on page 66*]

Bogy in the Sky

By THOMAS SHERIDAN

Concerning the Comet Doom . . . and what may happen in 1985 A.D., as against what one man believes to have happened in 1500 B.C.

Much as a judge might reach for the black cap to pronounce sentence of death, the great astronomer stretched out his hand in a dramatic gesture of finality.

"The human race," he announced gravely, "is doomed! My calculations, which I have checked and re-checked, clearly show that the comet now approaching us will intersect Earth's orbit at a distance of only one million miles. Though we shall escape collision with its tremendous head, our fate is still sealed. For we shall pass right through its immense, glowing tail which now stretches across the night sky, striking terror to the hearts of all people!

"Well might we cringe before this advancing horror! Does not this vast trail of incandescent vapour, which might coil itself about our puny planet four thousand times, carry the seeds of Man's destruction . . . in the form of at least seven and a half cubic centimetres of deadly poison?"

THE FIGURES are, of course, as fictitious as the rest of this thrilling excerpt from an imaginary epic entitled *The Comet Doom* or *The Day the World Ended.* Still, they are fairly probable; far more so than our world-famous astronomer's rich sense of bathos. For the menace of the comet is entirely a product of the imagination, without foundation in fact, except in so far as history records a persistent belief in the bogy and the long train of calamities which have been associated with cometary visitations.

Many a work of fiction encouraging the notion has been inspired by the hereditary fear which comets have evoked since man first gazed at the stars and was appalled by those which sprouted tails and threatened to fall upon him. Such deep-rooted dread does not disperse easily before the reassurances of modern astronomy; and it is only a comparatively few years since we began to elicit the true facts about these still very problematical members of the Solar System. Against that recent understanding is a great weight of superstition and misapprehension regarding their strangely elusive habits and supposed potentialities for destruction, which

even to-day obsess—besides fiction writers—such ingenious theorists as the scholarly Dr. Immanuel Velikovsky, whose remarkable work* has created enormous interest in America and, to a lesser extent, in this country.

Of the 6,000 comets that, according to a Russian observer's estimate, may roam around the Solar System in their elongated orbits, more than 1,000 have been recorded and only about 200 of these have been seen by the unaided eye. The vast majority which come our way in their rush around the Sun are observable only by astronomers, or do not approach Earth closely enough to be distinguishable from the stars which cannot sport luminous tails. But when, occasionally, an outsize specimen passes us by, like the several Great Comets of the last century, it may assume such monstrous proportions that it is difficult to view it without some misgiving. Even if the viewer realises that, for all its frightful aspect, it is really quite harmless—as few of our forefathers did.

In ancient times, when the mysteries of the heavens were explainable only by quaint philosophical reasoning, all life on Earth was thought to be subject to the malign influence of comets. Even the feathered world was affected: witness the Roman hen which was reputed to have laid an egg bearing a picture of one ill-omened visitant! Through the Middle Ages the fancy held that a comet meant death for a monarch or the approach of war or famine. The Norman Conquest was inevitable, in the view of our Anglo-Saxon forebears, heralded as it was by a comet which got itself into the famous Bayeux Tapestry.

This was the same comet which in 1910 filled the world with trepidations of more widespread disaster; the same one, too, it is believed, which a Chinese parchment records as having appeared in 240 B.C. The most famous comet of them all, in fact, which in 1682 enabled Edmund Halley, Astronomer Royal to Charles II, to deduce that these eccentric bodies actually belong to the Solar System instead of rushing from star to star as Kepler supposed. Fixing its revolution about the Sun at seventy-six years, Halley traced its earlier visits back as far as 1456 and ventured to forecast its next return. In 1758, sixteen years after his death, it duly turned up again to prove his theory, and has kept its periodical appointments with Earth ever since.

Seventeen centuries earlier, the Roman philosopher Seneca had written: "The time will come when our descendants will wonder that we were ignorant of things so simple. Some day there will arise a man who will demonstrate in what region of the heavens the comets take their way; why they journey so far apart from other planets; what their size and their nature."

BUT THE peculiar laws which govern the movement of comets (for instance, unlike the planets, they travel round the Sun in both directions and at all angles) did not concern their earlier observers so much as their dire significance. Not only were they

*WORLDS IN COLLISION, *by Immanuel Velikovsky. Gollancz, London,* **15s.**

portents; they were ever objects of blame. One that appeared in 371 B.C. was credited with the submergence of two ports in Achaea in an undersea convulsion; another was held responsible for the birth of a two-headed calf near Rome. The Danes once called freak children "comet children" and refused them baptism. Comets "withered the grass in the meadows, and caused the dying of cats."

In Shakespeare's day the naïve peasantry believed they were the result of human wickedness ascending to the skies as noxious vapour which was set alight by God's wrath to descend again upon their heads, bringing sudden death, pestilence, bad weather and other punishments for their sins. For centuries the comet was the symbol of almighty vengeance, with which the bishops found it convenient to adjure repentance on the eve of Domesday, while shivering in their own shoes. The sinister shapes which the apparitions took—the resemblance of a comet's tail to a scimitar or a sword was obvious, and sometimes it was ominously forked—made them objects of terrible meaning to the panicky populace, who saw in one sixteenth-century visitant "the figure of a bent arm holding in its hand a great sword, as if about to strike," besides "a great number of axes, knives and blood-coloured swords among which were hideous human faces with beards and bristling hair." No wonder "some died of fear and others fell sick"!

Yet there were a few courageous spirits who were not so dismayed by these celestial horrors. An old print in the British Museum shows a smith, a mighty man indeed, trying to extinguish a comet's fiery breath with a pair of bellows. Alphonso VI of Portugal, as if to scout the current idea of their effect upon crowned heads, is said to have defied one appearing in 1665 by firing his pistol at it. So concerned was Louis XIV of France at the mischief caused by cometary superstition—consistently nurtured by the astrologers, who classified comets according to their particular brand of evil—that he ordered the publication of a scientific work designed to eradicate such misconceptions.

But it was not always the uninitiated who were prey to the anxieties produced by the spectre of the comet. The great Laplace, who in 1796 worked out a masterly hypothesis of the origin of the Solar System and who recognised the orderly movements of the planets, in considering the not-so-predictable behaviour of these starry lunatics, decided that Earth could hardly escape disaster in a collision with one of them. The result, he thought, would be to upset the planet's rotation on its axis to such an extent that the seas would sweep over the continents; and he painted a terrible picture of animals, men and monuments "overwhelmed by this universal deluge, or destroyed by the violent shock."

Nor was he alone in his opinion. A contemporary of his, Lalande, of the French Academy of Sciences, published a paper giving his view that of the sixty comets then known eight might approach Earth closely enough to make the oceans leave their beds and deluge a large part of the world; this at a time when one was spreading panic through Europe. The more they

observed and tabulated them, indeed, the more scientists seemed to vie with one another in predicting the awful catastrophes which comets might bring to mankind.

One feared that a comet might infect Earth's atmosphere with deadly bacilli—a streamlined version of the earlier harbinger - of - plague idea. Another thought that a comet might rob us of the Moon. The astronomer Lambert, who first probed the immensities of the Milky Way, actually visualised Earth itself being carried off in a comet's head to regions of space remote from the Sun where all its inhabitants would freeze to death on a dark, ice-encrusted globe. As a piece of fanciful thinking, that almost takes the prize from Camille Flammarion, whose *Omega: The Last Days of the World*, is a masterpiece of science fiction on the comet doom theme.

FLAMMARION, who combined astronomical research with much fantastic conception, wrote his book towards the end of the last century, when speculation upon their cataclysmic effects was as rife as comets were frequent. It depicts the disastrous consequences to the world of the twenty-fifth century (which has abolished war and established radio communication with Mars and Venus) of a giant comet which collides almost head-on with Earth and asphyxiates hundreds of thousands of its luckless inhabitants by upsetting the delicate balance of the atmosphere. But no more—the world does not come to an end for another ten million years during which Man advances with giant strides through another hundred pages.

Still, the author did consider the possibility of the entire human race being annihilated as the result of a comet being so careless of its own safety, as well as ours, as to rush headlong into the Sun. In such an event, he thought, solar radiation would mount to a degree which would destroy all plant and animal life on Earth in a few days. In support of this notion he quoted a physicist who somehow contrived to deduce that a comet as big as that of 1811 would, in a collision with the Sun, produce six times as much heat as the combustion of a mass of coal equal to that of the comet. By the same argument, if it collided with Jupiter, it would raise the temperature of that monster planet to a point which would restore its former brilliance, making it a second sun which would illumine Earth at night and dim the Moon's glory. A rather more pleasant prospect . . .

Actually, this particular comet steered clear of the Sun by some eighty million miles and kept its distance from Earth by another million or more. But its dimensions were such that it made a magnificent spectacle in our skies for well over a year: its vast head was more than a million miles in diameter and its whole length stretched for a hundred million miles through space. Even then, it wasn't the biggest of the giant comets which sent our great-grandparents hurrying off to church to make amends, just in case. The monster which glared down at them in 1843 had a tail almost as long again and was visible by broad daylight, stretching diagonally across a good third of the sky.

What *would* happen if Earth fell

foul of one of these bogies of the void? If—? As a matter of fact, it *has*, more than once, and mankind still survives. It will probably do so again, without any ill effects—except to the comet. In any such cosmic collision, the odds would be all in our favour; or so the evidence suggests.

The first indication astronomers had that these fierce-looking visitants were really quite fragile, and more likely to meet with disaster themselves than do damage to smaller but much more substantial bodies like planets, came in the year 1770 when Lexell's Comet passed within two million miles of Earth. As a result, though Earth did not seem the slightest bit affected, the comet's orbit was greatly changed by the planet's gravitational influence. Seven years later the same comet passed close to Jupiter, whose mighty mass, augmented by his four giant satellites, was enough to throw it off on an orbit which took it right out of the Solar System; and it has never been seen since.

Jupiter is, in fact, a veritable death-trap for any comet venturing within a million miles of him. Even over a hundred times that distance he exerts his tremendous drag on them as they wend their way in towards the Sun, often slowing them up as they pass him by, or cutting down the time they take to complete their elliptical trips and compelling them to return his way forever—if he doesn't dismiss them summarily. He has quite a family of comets which he has captured and condemned to a lingering death if not to swift disruption. For example, Brooks' Comet of 1889, which not only had its orbital period reduced from twenty-nine to seven years, but had its head sheared off and was carved up into five separate pieces, which were only seen once before they vanished altogether.

AND EARTH, if not quite so ruthless with the comets that approach her, can deal well enough with those that try her strength, as was demonstrated just over a century ago. The comet concerned was one which had been discovered by an Austrian Army captain named von Biela. It was one of Jupiter's prisoners, and since 1772 had been observed completing its period of six and a half years without untoward incident. Among those who kept an eye on it was the German astronomer Olbers, who on the strength of his calculations predicted that when it came this way in 1832 it would pass across the Earth's orbit.

That announcement, without reference to the question of where Earth would be in relation to the comet at that time, started an end-of-the-world scare which only subsided when the famous Director of the Paris Observatory, Arago, showed that at the precise moment the comet crossed Earth's path the Earth itself would be some fifty million miles away from it. Enough room and to spare for both; and so it turned out. But Biela's Comet only survived to suffer disruption from other gravitational forces than those which might have bested it had it collided with Earth there and then.

When it was examined through a telescope in 1846, shortly after one of its subsequent visits, it was seen to have split into two parts, each having

its own head and tail and being joined to the other by a luminous band. At its next visit this link had disappeared and the two separate parts of the comet had been forced more than a million miles apart. It then appeared that when the comet's remains passed our way once more they would cross Earth's orbit at the exact point where Earth would be at the appointed time. A collision between the planet and the head of one of the twin comets seemed inescapable.

It did, in fact, take place. But all that resulted was a brilliant display of meteors—lumps of cosmic debris which were quickly dissolved by the ocean of air that protects us from these showers of heavenly missiles. Again, in 1885, the same swarm of meteors—promptly christened the Bielids, since they were all that was left of the unhappy comet —glowed briefly as they swept through our atmosphere. Now, even the name is gone. We call them the Andromedids, after the constellation from which direction they still come every November, now that the bits and pieces of Biela's Comet are strung out along its old orbit.

And that, we now know, is about all the real substance there is to the "menacing" comet. The *nucleus* is never more than about 6,000 miles in diameter, and may be as little as one hundred. It consists of a collection of solid masses of meteoric rock, from small stones to pretty hefty boulders, such as you may see in museums. These fragments are held together by their own mutual attraction, within a gaseous envelope which forms the *coma*—the great, malevolent-looking head which may be as much as two million miles across. It sprouts a tail as it approaches the Sun only because this gaseous material which all meteoric particles produce is driven out by the solar radiation; and by reason of the somewhat incredible fact that light has mass, the Sun's rays not only make the comet glow but actually push the very attenuated substance of the tail away from the heavier nucleus where it originates. So the tail tends to point away from the Sun whether the comet is "coming" or "going," and it appears to us to retreat from His Solar Majesty tail-first.

Before the great Swedish chemist Arrhenius applied his light-pressure theories to the structure of a comet's tail, Olbers had the notion that its incredibly minute dust-particles were repelled by some sort of electrical influence emanating from the same source. Following this line of research, the Russian Brédikhine claimed to be able to tell of what comet's tails were composed by noting their shape. Classifying them into three types, he concluded that long, straight tails were formed of hydrogen; curved tails contained hydro-carbons; and the short, brush-like tail which bent round in the shape of a sickle denoted the presence of iron and sodium.

BY THAT time the Italian Donati, who gave his name to the beautiful scimitar-shaped comet of 1858, had subjected to the spectroscope the problem of their composition, and these elements were known to be present. Later analysis disclosed traces of nitrogen, carbon monoxide, cyanogen, and various hydro-carbons including methane. And so, in spite

of the dreadful monster being revealed as a puffed-up, delicate creature whose tail was so diaphanous that it could not even obstruct the light of distant stars, the myth of the comet's malignance persisted. However flimsy it might be, it was still poisonous. Those noxious vapours in the tail, wherever they came from, might pollute Earth's atmosphere. In any encounter with a comet, the human race was none the less liable to extinction.

Although in the summer of 1861 the Earth and its Moon had actually travelled through some million miles' thickness—or thinness—of a Great Comet's tail without any effects apart from a peculiar luminosity in the sky, this new variant of the comet doom seized hold of the public imagination. Hence the world-wide scare when, in 1910, the celebrated Halley's Comet came this way again and it seemed that Earth must pass through its tail, which according to report contained poison gas. Rumour went so far as to declare, not only that all life on the globe would succumb to the taint, but that the absorption of the comet's gases by the atmosphere would cause a gigantic explosion. The world would end in a blaze of glory!

Thousands of telescopes watched the gradual approach of the invader, which at length became visible to the naked eye as a feeble streak among the stars of the northern hemisphere. But in other latitudes it was an awe-inspiring sight, and all the reassurances of the scientists could not assuage the fear which gripped a large proportion of Earth's people. A New York merchant built his own armoured dug-out equipped with oxygen cylinders to keep himself and family alive during the sixty-minute period of the globe's immersion in the comet's tail. From many countries came daily news of suicides prompted by the dread of world destruction.

On the fateful day, the head of the comet remained about 14,000,000 miles away from Earth, but the 30,000,000 miles-long tail swept directly across its path. And in the early morning of 20th May, after a night of terror, the world passed once more through a comet . . . and emerged unscathed. Except for those who kept their heads under the bedclothes too long, no one was suffocated. The atmosphere did not explode. A green ring around the Moon and a slight glow in the sky were observable phenomena reported by watchful astronomers; a scientist in Italy noticed a certain increase in the electrical tension of the air, and the compass needles of ocean liners played tricks. But not a trace of poison gas was to be found in the phials which had been sent up by balloon to take samples of the upper air during the Earth's plunge through the comet's tail.

And no wonder. For the gases in that tail—as in all comet's tails, as far as we know—were so undetectably diffuse that if they *could* be collected, compressed and liquefied they would scarcely fill a good-sized bottle. The nearest thing to a perfect vacuum that we can conjure up in our laboratories to-day is perhaps more dense than the vapours of a comet's tail. In fact, the density of the average comet, as nearly as we can estimate, is *very much* less than one-thousandth of the density

of the air we breathe at the surface of our world. And that is being very flattering to the monster, which is so ethereal as to be practically non-existent*.

What if the Earth ran full tilt into the *head* of a comet—a perfectly healthy one, of good density, rather than the divided remnants of the ghost of a comet like Biela's? Some scientists have declared, somewhat rashly, that such an encounter might mean the end of the world—that the friction caused by a collision with the solid particles of the nucleus would result in so much heat that the oxygen in the air would burn up and all life and vegetation be destroyed. Even Sir Richard Gregory, the late editor of *Nature*, admitted as much; and there is evidence in Arizona of the damage a really big meteor can inflict on Earth's surface. But if you cannot accept the verdict of one scientist that the mass of the head of a typical comet is, at the most, only one-millionth the mass of Earth, you may take heart from the calculation of another that the chances of such a collision are so remote that it may be expected but once in forty million years.

IN ONE of the hundreds of footnotes to his quotation-packed book, Dr. Velikovsky records that Arago himself computed the chances of a comet hitting the Earth as even more remote—one in 280 million. What, then, of the Doctor's own idea that twice within little more than half a century, round about 1500 B.C., a comet grazed this planet so narrowly that it caused two major world catastrophes? If one accepts this hypothesis, he says, it immediately presents the answers to many questions that science still has to resolve to its complete satisfaction—but only if you will admit that it may not have the right answers to many others which it thinks it *has* settled. Obviously, this was no ordinary comet. Or, if it was, our conception of comets as of to-day is still very erroneous . . .

Velikovsky's Comet, according to him, originated in the planet Jupiter, which threw it out towards the Sun in an eruption of its surface. At its first approach, the comet's head came very close to Earth, producing universal subterranean tremors, volcanic eruptions, tidal waves and other frightening disturbances; while a "hail of stones" —meteorites—poured from a sky made dark by the comet's tail, whose dust turned the seas and rivers a bloody red. Something else, too, came down —naphtha, which went to produce our oilwells, and ambrosia, or the manna which sustained the fleeing Israelites in the desert.

The story of this visitation is, in fact, all there in the Old Testament, according to Dr. Velikovsky. It accounts most conveniently for the plagues the Egyptians suffered prior to the Children of Israel's deliverance —including the insects: either the comet "infested the earth with vermin which it . . . carried in its trailing atmosphere in the form of larvae," or "the internal heat developed by the earth and the scorching gases of the comet were in themselves sufficient

*The mass of Halley's Comet has actually been estimated at about one billion (1,000,000,000,000) tons. But don't let that figure impress you too much: it represents roughly one fifty-millionth of Earth's mass.

to make the vermin of the earth propagate at a very feverish rate," thus also accounting for the plague of frogs. Then, while the fugitives made the most of their opportunity, "a phenomenon of great significance took place. The head of the comet did not crash into the earth, but exchanged major electrical discharges with it. A tremendous spark sprang forth at the moment of the nearest approach . . . when the waters were heaped at their highest," and "instantly pushed down the miles-high billows," dividing the Red Sea and enabling the Israelites to escape their pursuers!

The comet passed, leaving the seas boiling and the Earth groaning; but fifty-two years later it came back, to cause further havoc and account for more Bible miracles. When it stopped Earth's rotation, it produced the effect of Joshua's commanding the Sun to stand still. It reversed the Earth's magnetic poles and tilted its axis as it set the planet spinning in the opposite direction; it altered the length of the day and the year, shifted the polar regions—and caused the walls of Jericho to fall down. If Plato had only been as careless with his dates as Velikovsky suggests, it might even have caused the sinking of Atlantis . . .

But wait! Having wrecked Earth twice, but left the human race intact—in spite of much flouting of the laws of gravitation—the comet, or what was left of it, then proceeded to give the planet Mars a jolt, enough to make it swerve out of its course and bring that world dangerously close to ours on two occasions. Hence the legendary aggressiveness of Mars, which assaulted Earth in the seventh and eight centuries, before it settled in its present orbit. And the wayward child of Jupiter itself settled down, finally, to an almost circular orbit about the Sun —as a comet no longer. Now, believe it or not, it is the planet Venus! That brilliant envelope which hides its secrets from our telescopes "is the remnant of its tail of the days when, three thousand years ago, it was a comet." So says Dr. Velikovsky.

And so this truly amazing notion will serve to explain, not only how Earth's mountains and continents were constructed, what caused the Ice Ages, why the mammoths were exterminated, and so on, but will give the answers to the extra-terrestrial problems of the craters of the Moon, the canals of Mars, and the constitution of the atmosphere of Venus. It will even solve the riddle of the origin of the Solar System—which, says Velikovsky, cannot be divorced from that of the origin of comets. Incidentally, it will also make sense of some of the most peculiar of primitive myths and superstitions, accounting for dragons, witches and archangels and why the number thirteen is unlucky.

All this emerges from the mass of bits and pieces of folk-lore and other material which the author has carefully picked from the records of ancient races, from the Chinese to the Mayas, in support of his science-fantasy—which, mind you, is put forward in all seriousness. Unfortunately, though it is all remarkably persuasive, it is not enough to outweigh the existing scientific evidence against it, apart from what is lacking to bolster up his case. And it is a little too much to expect us to believe the

historical records are not more complete because the human race is suffering from "a collective amnesia" deliberately induced by the terrors it is supposed to have survived.

Anyone who reads *Worlds in Collision* will, however, want to investigate further in his promised sequel, *Ages in Chaos*, Velikovsky's grand claim that "cosmic collisions are not divergent phenomena . . . in defiance of what is supposed to be physical laws, (but) more in the nature of occurrences implicit in the dynamics of the universe." He holds, not only that planets have collided in the past, but that they may do so in the future; it was just such a collision, he argues, that caused Jupiter to spew out the comet which became Venus, and future contacts between the worlds may produce more comets—which may strike Earth and cause further chaos. It is all very suggestive of an atomic chain reaction—and very reminiscent of Buffon's Theory.

Buffon was a French naturalist who, just over two hundred years ago, offered the first serious speculation concerning the birth of the planets, based on what was then known of their nature from astronomical observation. In his *Natural History* he advanced the theory that a monster comet, arriving from outside the Solar System, collided with the Sun and tore great masses of its incandescent substance away from it. Instead of falling back to the surface of the parent body, these fragments whirled off to circle around it, later to condense and form the planets. The idea was considered reasonable enough at the time; but it was soon eclipsed by the Nebular Hypothesis of Laplace, since when the name of Buffon has hardly got a mention in the text-books.

And if you are still here when Halley's Comet returns in 1985, and Earth is fated to pass through it again—which is doubtful—it is hardly likely that you will have further cause to worry. Rather, you will have only to imagine something like a metal ball-bearing in a whiff of cigarette smoke to appreciate the situation, and let your hoary head rest easily on the pillow.

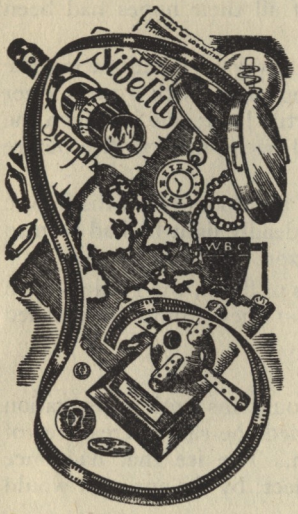
Silence, Please!—*continued from page 56*

so that there can be none of these accidents again. And they'll be hired, not sold outright. You might be interested to know that I'm expecting a big order from Empire Airways. Atomic rockets make a devil of a noise, and nobody's been able to do anything about it until now."

He picked up the sheaf of papers and ruffled through them lovingly. "You know, this is quite a good example of the inscrutable workings of fate. It only goes to show that honesty always triumphs, and that he whose cause is just—"

We all moved at once. It took him quite a while to get his head out of the wastepaper basket.

THE END



History Lesson

By ARTHUR C. CLARKE

To the scientists of an alien planet that relic of Earth's ancient culture showed Man as an arrogant little biped for whom life had been violent and energetic . . .

Illustrated by Powell

NO ONE could remember when the tribe had begun its long journey: the land of great, rolling plains that had been its first home was now no more than a half-forgotten dream. For many years Shann and his people had been fleeing through a country of low hills and sparkling lakes, and now the mountains lay ahead. This summer they must cross them to the southern lands, and there was little time to lose.

The white terror that had come down from the Poles, grinding continents to dust and freezing the very air before it, was less than a day's march behind. Shann wondered if the glaciers could climb the mountains ahead, and within his heart he dared to kindle a little flame of hope. They might prove a barrier against which even the remorseless ice would batter in vain. In the southern lands of which the legends spoke, his people might find refuge at last.

It took many weeks to discover a pass through which the tribe and its animals could travel. When midsummer came, they had camped in a lonely valley where the air was thin and the stars shone with a brilliance none had ever seen before. The summer was waning when Shann took his two sons and went ahead to explore the way. For three days they climbed, and for three nights slept as best they could on the freezing rocks. And on the fourth morning there was nothing ahead but a gentle rise to a cairn of grey stones built by other travellers, centuries ago.

Shann felt himself trembling, and not with cold, as they walked towards the little pyramid of stones. His sons had fallen behind; no one spoke, for too much

was at stake. In a little while they would know if all their hopes had been betrayed.

To east and west, the wall of mountains curved away as if embracing the land beneath. Below lay endless miles of undulating plain, with a great river swinging across it in tremendous loops. It was a fertile land; one in which the tribe could raise its crops knowing that there would be no need to flee before the harvest came.

Then Shann lifted his eyes to the south, and saw the doom of all his hopes. For there, at the edge of the world, glimmered that deadly light he had seen so often to the north—the glint of ice below the horizon.

There was no way forward. Through all the years of flight, the glaciers from the south had been advancing to meet them. Soon they would be crushed beneath the moving walls of ice. . . .

THE SOUTHERN glaciers did not reach the mountains until a generation later. In that last summer, the sons of Shann carried the sacred treasures of the tribe to the lonely cairn overlooking the plain. The ice that had once gleamed below the horizon was now almost at their feet; by the spring it would be splintering against the mountain walls.

No one understood the treasures, now: they were from a past too distant for the understanding of any man alive. Their origins were lost in the mists that surrounded the Golden Age, and how they had come at last into the possession of this wandering tribe was a story that now never would be told. For it was the story of a civilisation that had passed beyond recall.

Once, all these pitiful relics had been treasured for some good reason, and now they had become sacred, though their meaning had long been lost. The print in the old books had faded centuries ago, though much of the lettering was still readable—if there had been any to read it. But many generations had passed since anyone had had a use for a set of seven-figure logarithms, an atlas of the world, and the score of Sibelius's Seventh Symphony printed, according to the flyleaf, by H. K. Chu and Sons at the City of Pekin in the year 2021 A.D.

The old books were placed reverently in the little crypt that had been made to receive them. There followed a motley collection of fragments: gold and platinum coins, a broken telephoto lens, a watch, a cold-light lamp, a microphone, the cutter from an electric shaver, some midget radio valves—the flotsam that had been left behind when the great tide of civilisation ebbed forever. All these were carefully stowed away in their resting place. Then came three more relics, the most sacred of all because the least understood.

The first was a strangely shaped piece of metal, showing the coloration of intense heat. It was, in its way, the most pathetic of all these symbols from the past, for it told of man's greatest achievement and of the future he might have known. The mahogany stand on which it was mounted bore a silver plate with the inscription:—

Auxiliary igniter from starboard jet of spaceship Morning Star, *Earth-Moon, A.D.* 1985

Next followed another miracle of the ancient science: a sphere of transparent plastic with oddly shaped pieces of metal embedded in it. At its centre was a tiny capsule of synthetic radio-element, surrounded by the converting screens that shifted its radiation far down the spectrum. As long as the material remained active, the sphere would be a tiny radio transmitter broadcasting power in all directions. Only a few of these spheres had ever been made; they had been designed as perpetual beacons to mark the orbits of the Asteroids. But man had never reached the Asteroids, and the beacons had never been used.

Last of all was a flat, circular tin, very wide in comparison to its depth. It was heavily sealed, and rattled when it was shaken. The tribal lore predicted that disaster would follow if it were ever opened, and no one knew that it held one of the great works of art of nearly a thousand years before.

The work was finished. The two men rolled the stones back into place and slowly began to descend the mountainside. Even at the last, man had given some thought to the future and had tried to preserve something for posterity.

That winter, the great waves of ice began their first assault on the mountains, attacking from north and south. The foothills were overwhelmed in the first onslaught, and the glaciers ground them into dust. But the mountains stood firm, and when the summer came the ice retreated for a while.

So, winter after winter, the battle continued, and the roar of the avalanches, the grinding of rock and the explosions of splintering ice filled the air with tumult. No war of man's had been fiercer nor had engulfed the globe more

completely than this. Until at last the tidal waves of ice began to subside and to creep slowly down the flanks of the mountains they had never quite subdued; though the valleys and passes were still firmly in their grip. It was stalemate: the glaciers had met their match. But their defeat was too late to be of any use to Man.

So the centuries passed; and presently there happened something that must occur once at least in the history of every world in the universe, no matter how remote and lonely it may be. . . .

THE SHIP from Venus came five thousand years too late, but its crew knew nothing of this. While still many millions of miles away, the telescopes had seen the great shroud of ice that made Earth the most brilliant object in the sky next to the Sun itself. Here and there the dazzling sheet was marred by black specks that revealed the presence of almost buried mountains. That was all. The rolling oceans, the plains and forests, the deserts and lakes—all that had been the world of man was sealed beneath the ice, perhaps forever.

The ship closed in to Earth and established an orbit less than a thousand miles distant. For five days it circled the planet, while cameras recorded all that was left to view and a hundred instruments gathered information that would give the Venusian scientists many years of work. An actual landing was not intended; there seemed little purpose in it. But on the sixth day the picture changed. A panoramic monitor, driven to the limit of its amplification, detected the dying radiation of the five thousand years old beacon. Through all the centuries it had been sending out its signals, with ever-failing strength as its radioactive heart steadily weakened.

The monitor locked on the beacon frequency. In the control-room, a bell clamoured for attention. A little later, the Venusian ship broke free from its orbit and slanted down towards Earth—towards a range of mountains that still towered proudly above the ice, and to a cairn of grey stones that the years had scarcely touched.

THE GREAT disc of the Sun blazed fiercely in a sky no longer veiled with mist, for the clouds that had once hidden Venus had now completely gone. Whatever force had caused the change in the Sun's radiation had doomed one civilisation but given birth to another. Less than five thousand years before, the half-savage people of Venus had seen Sun and stars for the first time. Just as the science of Earth had begun with astronomy, so had that of Venus, and on the warm, rich world that man had never seen progress had been incredibly rapid.

Perhaps the Venusians had been lucky. They never knew the Dark Age that held man enchained for a thousand years; they missed the long detour into chemistry and mechanics, but came at once to the more fundamental laws of radiation physics. In the time that man had taken to progress from the Pyramids to the rocket-propelled spaceship, the Venusians had passed from the

discovery of agriculture to anti-gravity itself—the ultimate secret that man had never learned.

The warm ocean that still bore most of the young planet's life rolled its breakers languidly against the sandy shore. So new was this continent that the very sands were coarse and gritty: there had not yet been time enough for the sea to wear them smooth. The scientists lay half in the water, their beautiful reptilian bodies gleaming in the sunlight. The greatest minds of Venus had gathered on this shore from all the islands of the planet. What they were going to hear they did not yet know, except that it concerned the Third World and the mysterious race that had peopled it before the coming of the ice.

The Historian was standing on the land, for the instruments he wished to use had no love of water. By his side was a large machine which attracted many curious glances from his colleagues. It was clearly concerned with optics, for a lens system projected from it towards a screen of white material a dozen yards away.

The Historian began to speak. Briefly he recapitulated what little had been discovered concerning the Third Planet and its people. He mentioned the centuries of fruitless research that had failed to interpret a single word of the writings of Earth. The planet had been inhabited by a race of great technical ability; that at least was proved by the few pieces of machinery that had been found in the cairn upon the mountain.

"We do not know why so advanced a civilisation came to an end. Almost certainly, it had sufficient knowledge to survive an Ice Age. There must have been some other factor of which we know nothing. Possibly disease or racial degeneration may have been responsible. It has even been suggested that the tribal conflicts endemic to our own species in prehistoric times may have continued on the Third Planet after the coming of technology. Some philosophers maintain that knowledge of machinery does not necessarily imply a high degree of civilisation, and it is theoretically possible to have wars in a society possessing mechanical power, flight, and even radio. Such a conception is very alien to our thoughts, but we must admit its possibility. It would certainly account for the downfall of the lost race.

"It has always been assumed that we should never know anything of the physical form of the creatures who lived on Planet Three. For centuries our artists have been depicting scenes from the history of the dead world, peopling it with all manner of fantastic beings. Most of these creations have resembled us more or less closely, though it has often been pointed out that because we are reptiles it does not follow that all intelligent life must necessarily be reptilian. We now know the answer to one of the most baffling problems of history. At last, after five hundred years of research, we have discovered the exact form and nature of the ruling life on the Third Planet."

There was a murmur of astonishment from the assembled scientists. Some were so taken aback that they disappeared for a while into the comfort of the ocean, as all Venusians were apt to do in moments of stress. The Historian

waited until his colleagues re-emerged into the element they so disliked. He himself was quite comfortable, thanks to the tiny sprays that were continually playing over his body. With their help he could live on land for many hours before having to return to the ocean.

THE EXCITEMENT slowly subsided, and the lecturer continued.

"One of the most puzzling of the objects found on Planet Three was a flat metal container holding a great length of transparent plastic material, perforated at the edges and wound tightly into a spool. This transparent tape at first seemed quite featureless, but an examination with the new sub-electronic microscope has shown that this is not the case. Along the surface of the material, invisible to our eyes but perfectly clear under the correct radiation, are literally thousands of tiny pictures. It is believed that they were imprinted on the materials by some chemical means, and have faded with the passage of time.

"These pictures apparently form a record of life as it was on the Third Planet at the height of its civilisation. They are not independent; consecutive pictures are almost identical, differing only in the detail of movement. The purpose of such a record is obvious: it is only necessary to project the scenes in rapid succession to give an illusion of continuous movement. We have made a machine to do this, and I have here an exact reproduction of the picture sequence.

"The scenes you are now going to witness take us back many thousands of years to the great days of our sister planet. They show a very complex civilisation, many of whose activities we can only dimly understand. Life seems to have been very violent and energetic, and much that you will see is quite baffling.

"It is clear that the Third Planet was inhabited by a number of different species, none of them reptilian. That is a blow to our pride, but the conclusion is inescapable. The dominant type of life appears to have been a two-armed biped. It walked upright and covered its body with some flexible material, possibly for protection against the cold, since even before the Ice Age the planet was at a much lower temperature than our own world.

"But I will not try your patience any further. You will now see the record of which I have been speaking."

A brilliant light flashed from the projector. There was a gentle whirring, and on the screen appeared hundreds of strange beings moving rather jerkily to and fro. The picture expanded to embrace one of the creatures, and the scientists could see that the Historian's description had been correct. The creature possessed two eyes, set rather close together, but the other facial adornments were a little obscure. There was a large orifice in the lower portion of the head that was continually opening and closing; possibly it had something to do with the creature's breathing.

The scientists watched spellbound as the strange being became involved in a series of fantastic adventures. There was an incredibly violent conflict with another, slightly different creature. It seemed certain that they must both be

killed—but no; when it was all over neither seemed any the worse. Then came a furious drive over miles of country in a four-wheeled mechanical device which was capable of extraordinary feats of locomotion. The ride ended in a city packed with other vehicles moving in all directions at breathtaking speeds. No one was surprised to see two of the machines meet head-on, with devastating results.

After that, events became even more complicated. It was now quite obvious that it would take many years of research to analyse and understand all that was happening. It was also clear that the record was a work of art, somewhat stylised, rather than an exact reproduction of life as it actually had been on the Third Planet.

MOST OF THE scientists felt themselves completely dazed when the sequence of pictures came to an end. There was a final flurry of motion, in which the creature that had been the centre of interest became involved in some tremendous but incomprehensible catastrophe. The picture contracted

to a circle, centred on the creature's head. The last scene of all was an expanded view of its face, obviously expressing some powerful emotion, but whether it was rage, grief, defiance, resignation or some other feeling could not be guessed.

The picture vanished. For a moment some lettering appeared on the screen; then it was all over.

For several minutes there was complete silence, save for the lapping of the waves upon the sand. The scientists were too stunned to speak. The fleeting glimpse of Earth's civilisation had had a shattering effect on their minds. Then little groups began to start talking together, first in whispers and then more loudly as the implications of what they had seen became clearer. Presently the Historian called for attention and addressed the meeting again.

"We are now planning," he began, "a vast programme of research to extract all available knowledge from this record. Thousands of copies are being made for distribution to all workers. You will appreciate the problems involved; the psychologists in particular have an immense task confronting them. But I do not doubt that we shall succeed. In another generation, who can say what we may not have learned of this wonderful race ? Before we leave, let us look again at our remote cousins, whose wisdom may have surpassed our own but of whom so little has survived."

Once more the final picture flashed on the screen, motionless this time, for the projector had been stopped. With something like awe, the scientists gazed at the still figure from the past, while in turn the little biped stared back at them with its characteristic expression of arrogant bad temper.

For the rest of Time it would symbolise the human race. The psychologists of Venus would analyse its actions and watch its every movement until they could reconstruct its mind. Thousands of books would be written about it. Intricate philosophies would be contrived to account for its behaviour. But all this labour, all this research, would be utterly in vain.

Perhaps the proud and lonely figure on the screen was smiling sardonically at the scientists who were starting on their age-long, fruitless quest. Its secret would be safe as long as the universe endured, for no one now would ever read the lost language of Earth. Millions of times in the ages to come those last few words would flash across the screen, and none could ever guess their meaning:

A Walt Disney Production.

THE END

IN THE NEXT ISSUE

NEMESIS

By ARTHUR C. CLARKE

The Charms of Space Opera

By JOHN K. AIKEN

LANCELOT BIGGS: SPACEMAN, by Nelson Bond. Doubleday, New York. $2.50c.
THE KINGSLAYER, by L. Ron Hubbard. Fantasy Publishing Co., Los Angeles. $3.00.
NOMAD, by George O. Smith. Prime Press, Philadelphia. $3.00.
PATTERN FOR CONQUEST, by George O. Smith. Gnome Press, New York. $2.50c.
THE PORT OF PERIL, by Otis Adelbert Kline. Grandon, Providence, R.I. $3.00.

WHAT, THE newcomer to science fiction may ask, is this space opera? Let us give him an example.

. . . the slave train, but a scant two hours ago happy travellers aboard the "Cosmos Queen," now bent and miserable beneath their burdens of loot, crept slowly across the dank plain of Ganymede. All about them in the inimical, alien swamp, dripping with sulphuric acid, echoed the hoarse cries of the brutish, web-footed natives, dimly discerned in the mephitic fog. Ahead loomed the pirate vessel, battered but formidable; before it stood the guard, finger itching on the trigger of his semi-atomic portable electronic vortex needle-blaster. Bill Hart found time and energy to press Diana Stewart's hand . . .

By the Cosmos, out of horse opera. An adventure story, in fact, in which the horse has been replaced by the spaceship and the terrestrial by a galactic setting; in which the plot—as in the best opera—is naïve, the atmosphere fantastic, and the characters pure "hack." By this term have such stories come to be known in their field, a considerable area of which they have occupied for several years; nor do they seem inclined to yield their position. Why should they, when so many readers demand them and there are writers to produce them?

Clearly, this kind of thing is easier to write than science fiction proper. No effort of logic or scientific imagination is required of its composer. The gadgets with which it abounds need not be explained, and their impact on the behaviour of the characters is nil: the Professor, his beautiful daughter, the hero and the villain, in however distant a future they exist, behave in a thoroughly twentieth-century manner. Any uncomfortable astronomical facts (such as the absence of oxygen or water in the atmosphere of Venus) which conflict with the story's requirements may also be set aside at will.

Credulity is not—or should not be—demanded of the reader. He is seeking only entertainment. If he is asked to swallow portable atomic blasters (which would either be too "hot" to hold or need a power-station to operate them), giant amoeba (which would fall to pieces under their own weight), velocities greater than the speed of light, giant spiders and/or voluptuous ladies living in inter-nebular space, he is prepared to do so—with his tongue in his cheek—so long as the entertainment is there. Like the lady who didn't believe in ghosts but was afraid of them just the same, one need not find space opera plausible to be entertained by it—so long as the author doesn't take it too seriously either.

How do these five operatic pieces measure up, by these standards? Nelson Bond emerges an obvious winner in a not very exalted class. He is, approximately, the P. G. Wodehouse of science fiction (or the Gilbert-plus-Sullivan of space opera), and his Lieutenant Lancelot Biggs, gangling spaceman, is a combination of Ukridge, Bertie Wooster and Jeeves, with the awkwardness of the first, the fatuousness of the second, and the flashes of unpredictable genius of the third. Whether he is delivering cargoes faster-than-light, returning from the dead, growing black

roses, or capturing space pirates on his interplanetary freighter, he is good value. This sparsely-cemented compilation from various magazine sources of his triumphs, mishaps and wooing of the captain's daughter is, indeed, space-comic-opera at its best.

Mr. Hubbard, with his title novelette and two shorter stories ("The Beast" and "The Invaders") is less successful in his greater gravity, with no compensating increase in plausibility or human interest. "The Invaders," least solemn of the three, is also by long odds the best: the tale of a technician who has to convince a pompous military gent that the Crystal Mine his ship is working in the vasty deeps of the Black Nebula is, through some spatial quirk, actually within the guts of a worm. "The Kingslayer" itself is Hubbard at his most characteristic, a space opera *par excellence* in which the swashbuckling hero wins bride and position by means of a few ingenious tactics and much lucky coincidence. That the author of *Dianetics* is not devoid of humour, however, saves him and his reader from mutual friction.

Mr. Smith is not so fortunate. He takes his protagonists, his plot and his scientific ideas far too seriously for good space opera; yet he does not think about them enough, nor write well enough, to produce real science fiction. His descriptive writing is the purest journalese. His dialogue is flat with a terrible flatness, despite the fact that no character ever says anything which cannot possibly be snapped, hissed, grinned, thundered, grimaced, chorused, laughed, exploded, wisecracked or snarled. It is difficult to believe that twentieth-century engineers could converse with such deadly monotony; it is quite impossible to believe it of Solar Co-ordinators and Lords of the Universe.

Mr. Smith can describe the mass destruction of intelligent life so that it is neither tragedy nor portent, nor even comedy *a la* Damon Runyon—it is simply words. Characterisation is wholly superficial, wit is absent; even the alien scenery is missing. All, in fact, that goes to make space opera tolerable is omitted from these two laborious sagas. The only question is which is the worse: *Nomad*, in which the hero and heroine become chief executives of the Solar System, or *Pattern for Conquest*, in which Earthling Billy Thompson gets effective control of the Galaxy by selling to its strangely rational and approachable dictators the idea that Terrans are too valuable as technicians to be destroyed. The love-interest in the latter is especially badly handled, but since it vanishes halfway through, never to return, this book is perhaps a shade the more readable.

It is almost a relief to turn to the late Mr. Kline, who, like Edgar Rice Burroughs —to whose work his own owes a good deal —was one of the pioneers of space opera in its original, unsophisticated form. In *The Port of Peril* there is plenty of extra-terrestrial scenery and action—mostly fighting. It is a simple tale, in which a race of Venusian beast-men-cum-pirates abduct Robert Grandon's bride. He is not one to be treated in this fashion, however, having survived two earlier volumes* full of the same sort of thing; and he proceeds to wipe out the pirate horde, while dealing on the side with the odd monster or two.

Mrs. G., too, has her moments:

. . . Vernia, however, remained proudly erect, returning the appraising look of the creature on the throne with one of withering disdain . . .

Yin Yin, meanwhile, refreshed himself with a cup of steaming kova and stuffed his mouth with fresh kerra spores. He mumbled them for some time in silence, ogling Vernia the while, then spat and said: "We do not wonder that a certain torrogo, who shall be nameless, offered us the price of an empire for you. You are more than worth it."

"I care not for your compliments, you yellow filth," retorted Vernia, spiritedly . . .

We should add, perhaps, that part of the Rogo of Huitsen's regal equipment is a jewelled cuspidor. But that is a concession to good taste which we, hardened as we have become to the crudities of life on other worlds, would be prepared to forego. If you can stand toad-men, monster scorpions, and serpents big enough to swallow two Valkars at one gulp, you can stomach anything. And if you can't, you should steer clear of space opera.

**The Planet of Peril* (McClurg, Chicago: 1929); *The Prince of Peril* (McClurg: '30). *The Port of Peril* was originally published as a serial in *Weird Tales* in 1932-33.

Martian Mandate

By NORMAN C. PALLANT

A handful of people against a world not yet ready to receive them . . . a world of flaming mountains and reeking swamps where Man was destined to evolve . . . Or to adapt himself?

Illustrated by Turner

THE THIRD form at Draffich village school enjoyed at least one of its lessons. Perhaps that was because it was not strictly a lesson at all, but a free debate conducted each week by the form master, Mr. Bulton. It was an idea he had got from listening to a radio programme called "Any Questions?" This afternoon, sitting at ease in front of his class, he beamed upon Teddy Roberts, his newest inquirer, cleared his throat and began . . .

"Atlantis, eh? Now that is a very intriguing subject. Of course, you all know —or should know—that Atlantis is a mythical continent which Plato wrote about in the first place. According to him, it was situated somewhere in the Atlantic Ocean and was at some vague date the site of a highly advanced civilisation which was destroyed by a huge tidal wave.

"It is among the most fascinating of legends. Quite a number of books have since been written about it, and there are many people who firmly believe that there actually was such a continent. I myself must confess that I have speculated upon its existence. Certainly, it opens up some most imaginative lines of thought. But first let me tell you something about its civilisation as Plato describes it. Then I will touch on theories as to how . . ."

THROUGH THE warm, clinging clouds of the lower atmosphere the slender black ship felt her way. Rathu Rathuris stood by the side of his navigator, in the instrument-studded cabin that was perched like a shining bubble on the nose of the *Sadur*, and said nothing. His forefinger rubbed interminably at the point of his long chin, and his eyes flicked from dial to dial as they recorded the findings of a dozen experts throughout the vessel.

Air content, air pressure, degrees of oxygen and of nitrogen—all were there, with wind velocity, atmospheric heat, the presence and distance of mountain ranges shown as a series of shimmering lines undulating on a screen. Although the *Sadur* flew blind, she possessed eyes and senses to which the fog of cloud was no handicap at all; and Rathuris was content to read the dials and listen to the calm voice of the navigator, Ban Banlik, as he nursed the ship downwards. He listened, too, to the equally cool tones of Sahloh Sahloris, the chief engineer, as he repeated and responded to Banlik's directions.

The great engines which had hurled the *Sadur* across forty-eight million miles of space were silent now, their motive force replaced by the smaller motors that were designed for atmospheric work. Their purring was faint beyond the confines of the navigation room, although in the cramped quarters of the stern they roared with a thunderous voice that was music to the ears of Sahloris, their master and slave.

For the past hour Rathuris had relinquished command to the navigator. When the *Sadur* cleared the cloud swath he would reassume responsibility, but this initial phase of contact with a new world was Banlik's job. Rathuris had little idea what kind of terrain lay below the obscuring clouds. Telescopic observation and analysis on his home planet over several centuries had confirmed the existence of land-masses glimpsed occasionally through the cloud envelope that veiled the Sun's third planet. But these land-masses appeared to vary in shape and size over comparatively short periods, arguing a state of flux—a condition of earth tremor and disturbance consistent with the natural changes of a world still cooling and coagulating.

But the third planet was an unknown hazard. That was what made it almost inevitable that when Vadron decided to equip an exploratory expedition to Arlon, Rathuris, Prince of Zana and captain among captains, should be chosen to command it. Rathuris, dark, silent, reliable, was at the peak of a notable career; it was fitting that he should lead this most ambitious of Vadronian ventures. And with him were other elect—scientists, geographers, geologists, a company of Vadron's best.

Banlik turned from his contemplation of the instrument panel.

"About seven *ools* now, sir, and we shall be clear of the clouds."

Rathuris nodded briefly. His eyes scanned a fluorescent dial-face. It glowed faintly red behind the black lines of its symbols.

"Fourteen *mirads*," he grunted. "This is a hot world, Banlik."

The navigator nodded in turn, pursing his lips. "Yes, sir—hotter than they estimated at home. But not unexpected. Its internal heat must still be considerable."

Rathuris grunted again. "That means volcanic troubles every so often—the gods know what else besides. I'm beginning to have my doubts about colonising. I don't imagine Vadron will look kindly on a mandate in hell."

Banlik smiled, a little crookedly. "If these clouds mean much, sir, there should at least be plenty of water—and Vadron needs that."

"Yes," agreed Rathuris, sarcastically, "but not a whole world of it." He gave one final glance round him at the dials. "I'm going down to the saloon," he added. "Call me there when you get visibility."

"Ay, sir," said the navigator, and almost in the same breath passed a new order to Sahloris in the stern.

RATHURIS, as he stepped from the cabin on to the catwalk outside, felt the slow swing of the *Sadur* to port. His tall form, in its grey and green *wenna* uniform, strode lithely along the narrow platform and down the companion-way at its end. The silvery metal of a bulkhead opened at the touch of his hand on a switch, closing automatically after him as he ducked through it on to the plates of the starboard midships deck with its now unshuttered *vaxane* panels. Beyond these the whitish-grey of cloud slid past.

Halfway along the deck, a noiselessly retracting door admitted him to a long, comfortable room that sparkled with light reflected from metal fittings and from the pale blue of its ceiling and wall panels. There was a buzz of conversation that stopped as he entered.

The seven occupants of the saloon waited for him to speak. Three of them were women; but that was not in any way surprising. Vadron had long learned the qualities of its sexes, and it was no precedent that women should accompany their menfolk on such an expedition as this; in fact, it was equitable that they should do so if they chose. The Arlon bid was an uncertain one. Those who made it might not return. Vadron wanted no broken hearts at home, and in any case the women would be useful as ministers to male comforts. The Vadronian government were realists where matters of relationship between the sexes were concerned.

There were, in fact, eleven women on the *Sadur*—nine of them young. But for Rathuris there was only one, and she came forward to meet him now.

Doree Morsados was a dream of loveliness that caught at the breath with its sheer ethereality. She was tall, and complexioned with the light olive of her sex. Her tunic of blue *zina* fitted the flowing beauty of her form with a skilful economy

of design. With eyes and hair of gleaming midnight, she was Zentheda incarnate —the goddess of love in her court of stars.

Those who knew the dour, tyrannical Rathuris best, shared a secret amusement at the thought of this man of command in the role of tender lover. But Doree knew him best of all, and never betrayed him. The brief look that passed between them now in the dark shining of their eyes was for themselves alone.

Doree said: "Zanda and I have just made *bensa*. Will you join us?"

Rathuris smiled. "Thank you. In less than a *gaan* we shall be able to see what Arlon looks like. There should not be more than another six *ools* of cloud." He accepted a cup of steaming green liquid from the woman, Zanda, and looked across the room at a quiet man who stood as though awaiting orders. "Gurdaan, if the terrain is suitable I may land at the earliest opportunity. We should have another five *laans* of daylight. I shall want you and six others to stand by. Better break out light arms."

His first mate said: "Right, sir," and left the saloon at once. As he went, a whistle sounded shrilly and a red light winked from above the door. Rathuris, cup in hand, went across and spoke into a microphone below the light. Banlik's voice answered his inquiry.

"Cloud is thinning, sir. We seem to be above water—an ocean, I think."

"Very well," said Rathuris. "I'll join you."

He turned to the others, smiling faintly as he noted the look the third girl, Ferr, exchanged with two thin young men who were among the finest astrophysicists on Vadron. Rhe and Rhu Rhadoris would be among the first to set foot upon the new world. With a rare lapse of discipline, he walked across the room and patted the girl's shoulder.

"Don't worry," he said, quietly. "We are taking no unnecessary risks. Arlon is safe enough so far as its atmosphere is concerned." And, then, to the two young men: "Stand by for final tests, will you?"

He exchanged another quick glance with Doree before walking to the door. The brothers Rhadoris followed him. As the door closed Doree smiled at Ferr, their sister, and managed to include in the smile the three remaining occupants of the saloon: the girl, Zanda, Hora Horan, her husband and Zanan councillor, and the corpulent Feru Ferulus, to whom the most intricate engineering problem was mere child's play.

Doree said: "Shall we go on deck and see this world of Arlon? After all, we have come a long way for the sight."

THE *SADUR* held to a leisurely course twenty feet above the sea, her bow scanners reaching far ahead through the curtain of the heavy, warm rain. The waves' surface crawled with wisps and curls of steam like little ghosts that were there and gone almost simultaneously. There seemed to be nothing in the universe except the sluggish ocean and the shadow-lines of the rain.

But there was life in this alien sea. The group on the midships deck had seen it several times during the past half-hour. It was vague and shapeless as it leapt

and blundered from crest to crest of the slow swells. But to the palæontologist, Har Haruthis, in his tiny stern cabin, it was not so vague. His telescopic apparatus was busy magnifying and photographing each brief appearance, and he and his wife, Myru, were already classifying its types and potentialities. Some of it was undoubtedly invertebrate, drifting like tentacled sponges and blotches of jelly upon the surface; but it was obvious that an almost incredible diversity of creatures teemed in the depths.

Haruthis, making his first tentative report, said: "Arlon cannot possibly be very highly developed as a world. I believe its evolution is in an early stage. Its fauna is probably still largely if not wholly amphibious. The types of life so far observed in the ocean are similar to those known to exist in Vadronian seas long before human forms appeared. I consider it doubtful whether any kind of air-breathing creature will be found far above sea-level."

Coincidental with this report, the scanners indicated land less than two miles away to the north. With Rathuris in the navigation room was Ghar Gharru, his second-in-command. Gharru had just examined the palæontologist's summary. He was frowning.

"No human life. That was half-expected. But someone made a bad guess, if Haruthis is right about the rest. This means a planet of swamp conditions—heat and fever."

Rathuris nodded curtly. "Yes, I know. I've thought so for some time—ever since the extra-atmospheric probes were made."

"You will land in any case, I take it, sir?"

"Yes—a routine survey only in the first place."

"I'd better give instructions for insect masks, I suppose?"

"I think so—yes. Do that," said Rathuris. "And on second thoughts, I think you'd better go with Gurdaan. He's pretty sound usually, but he can be impulsive."

"Ay, sir. I'll go and look over their equipment."

As the door closed behind him, Banlik said: "By the way, sir, we can get no contact with Vadron."

Rathuris looked at him sharply. "Why not?"

"Thuril is not sure, sir. He sent out the usual signal over a *milgaan* ago, but Vadron does not reply. He is checking his transmitter now."

Rathuris looked serious. "Tell him to make every possible test. Get astrophysics on it, too. We must maintain communication. Inform me at once when contact is re-established."

Banlik's gaze was on the curving vision plate set in the middle of the control panel.

"Land, sir, six degrees to starboard. Looks like a promontory."

HARUTHIS, who had come up from his observation cabin to join the watchers on the starboard deck, felt his initial opinion vindicated.

"You see," he pointed out, as the *Sadur* hung under its gyro-helicoptic

mechanism above a strip of beach, "the tree-growth is either coniferous or cycadean, with a great abundance of fronded vegetation. The very numbers of the ferns show their dependence on water. Note the size of the conifers—they, too, are obviously lowland evergreens. I do not think there is likely to be a larger genus on high ground anywhere."

His finger indicated the sands above tide level. "Note, also," he went on, "the big, coiling shells. They are the shells of dead creatures like the *muuns* of our own antiquity. You can see others moving on the sea's surface. Arlon, my friends, is in its infancy. We shall find no life here other than types corresponding roughly to those which inhabited Vadron many millions of years ago."

Ferulus, a stoutly comfortable figure, said: "Just how does that affect the settlement of a colony? Very greatly?"

Haruthis frowned. "It is largely a question of climate and geological conditions. Most of Arlon will be fully tropical, and seismic disturbances must be very frequent. I shall be able to answer you better when I have examined its topography at first-hand."

Doree, standing with Zanda and Ferr, turned as the footsteps of Rathuris approached. She went to meet him at a distance from the others. He stopped and looked at her with gravity in his dark eyes. She laid a hand on his arm.

"What is it?" she said, softly. "You are troubled."

"We have lost contact with Vadron," he replied.

Her hand squeezed gently. "A breakdown?"

He shook his head. "Thuril at first thought so. He then discovered that his signals were being reflected from that region of electrified particles which envelops Arlon above the atmospheric belt. But, by changing his wavelength, he got his message through. Vadron would certainly use the same wavelength for its reply, but it does not reply."

His eyes searched hers. He said: "Perhaps you were right—back there in the Vin-Koolan pleasure gardens in Zana. You had a presentiment, you told me."

Her gaze dropped from his. "Did I?"

"I did not want you to come. You insisted. You said Arlon would hold me, but you would not say why you thought that. And when I in turn thought of the threat of war between the north and south, and you, alone in Zana . . . Doree . . ."

She looked up again, and her lips smiled, but not her eyes. "I could not be left," she murmured. "If this is to be our new world . . ."

"Why do you say that?" he questioned.

She shook her head. "I—I do not know. But I do know—as I knew then—that if anything happens here on Arlon, I must be with you."

He did not press her further; but for the second time within hours he showed the tenderness beneath the mask of discipline. He bent his head to hers and kissed her.

TRAGEDY STRUCK almost without warning out of the steamy haze of the Arlonian swamp-forests.

The rain had ceased an hour ago, and to the scouting party of eight it seemed that they moved in a world of steaming obscurity. The steam rose from spongy, lichen-covered ground and hung like a mist far into the sky, making shadow shapes of palm-like trees and ferns taller than the tallest among them. Through it glowed a Sun magnified monstrously by water vapour; and the heat made their faces moist and their limbs clammy beneath their clothing. The air they breathed was thick with the odour of rotting plant growth and murmurous with the sound of insect life.

Some among the insect species they had sighted had at first caused exclamations and a debate upon their possible menace. There were things with bodies over seven inches in length and wing spans up to a foot or even more; things that flew on four rigid wings and flapped their way among the flowerless ferns and mosses. But it soon became evident that none of these giants among the lepidoptera was in any way a danger. Nor were the dipterous species, whose droning was everywhere.

But insects were not the only winged denizens of the cycadean thickets. There were birds, too, of fair size and half-reptilian in character. What little plumage they possessed seemed to be confined to the wings, legs and tail, and when they alighted they gripped their perch with lizard-like hands whose three fingers were separate and mobile. An assistant naturalist in the party pointed out the thoroughly saurian aspect of their long heads. They were not beaked, and their tapered jaws showed sharp upper and lower teeth, while the tail in each case was long and whip-like, seeming to consist of vertebræ fringed with quill feathers. These extraordinary creatures were, nevertheless, obviously true birds, which glided with grace and ease among the ferns and conifers, croaking harshly when disturbed but offering no indication of their carnivorous nature.

Gurdaan and Gharru had led their companions to the edge of a lagoon some half-mile from the spot where the *Sadur* had landed. The black ship was invisible, veiled by mist and jungle, and around the lagoon the trees trailed their roots in the thickly-scummed water. Outwards over the water, visibility was a matter of some twenty yeards before it ended in a blank wall of steam.

"I want very little," Rathuris had said, "other than a general picture of conditions inland. I must accept the conviction of Haruthis that no form of human life exists. If, however, he should prove mistaken and you should encounter it, no antagonistic action must be taken unless in self-defence when all other steps have failed."

But the palæontologist was right—at least, so far as this particular region was concerned. They had seen no sign of anything save the insects and the strange birds. Two of the former and one of the latter they had killed as specimens for Haruthis. Except for the shot that had brought down the bird, their efficient little Vadronian hand-guns, which shot radioactive pellets of bynthis alloy, had remained in their belt holsters. Only Gharru, who had fired, held his in his hand.

They stood peering across the green scum of the lagoon, the steamy atmosphere clouding the glass eye-pieces of their masks.

Gharru conferred with Gurdaan. "Let us skirt the edge of the water for a while. I would like to see whether or not it connects with the sea in the other direction. Then we will return to the ship. There is no other life here."

Gurdaan shrugged his shoulders as they started cautiously among the bog and roots by the verge. "What a planet! Fog, heat—and water. I wonder even the birds and insects can stick it. It's pretty certain no other life could."

He was tragically wrong. Arlon had so far shown them nothing of the savagery and terror that lurked behind its screening fogs and green forest tapestry. Now the curtain was suddenly drawn upon one of its monstrous secrets.

Immediately behind Gharru and Gurdaan were the brothers Rhadoris, in earnest conversation that had something to do with Arlon's orbital motion. On the heels of their leaders they pushed their way through the outer fringes of a barrier of ferns running down to the water. And death was upon them so rapidly that Gharru's choked warning served them not at all.

The ferns were in turmoil among the haze as something vast and leprous grey heaved itself upright in a fury of screams and snarls. The Rhadoris brothers caught one soul-shattering glimpse of snake-like eyes in a nightmare head, of dripping fangs in an elongated snout, of a forty-foot body that blocked out the sun-glow. Then, out of the mist, flailing down the undergrowth, came a scaly greyness with the crushing power of a falling tree. The whipping tail licked at them once as the monster whirled, catching them in full swing, hurling them like dummy figures into the air and out over the scum-surfaced water.

Those who cowered back from the fern thicket saw a giant shape supported on columnous hind legs, a shape that roared hideously as its terrible head dipped in search of fresh prey. They saw the head dart downward, heard another and thinner scream added to the din; then it emerged again from the ferns, and this time it held between its jaws a human figure that waved arms and legs frantically for a moment before the fangs bit deep. The great tail lashed once—twice—more, and suddenly the frightful thing was off in a series of bounds that seemed incredible for a creature of its bulk and build, bearing with it the bleeding and broken remains of a man.

As they watched its retreat into the swirling fog and heard the crashing sounds of its progress, the screen of ferns moved and rustled once more. Hand-guns covered the spot, and four tense men waited. The fern brake parted. Out of it came a figure that walked with a curious stiffness, a figure that had strapped upon its shoulders the intercommunication unit that had kept the *Sadur* informed of their whereabouts. Gharru . . .

They went to meet him. As hands reached for him he said, "Gods—!"—and collapsed. He was completely unhurt, but beneath his insect mask his features were white and rigid with shock.

RATHURIS, his face expressionless, said: "You searched, of course?"

Gharru, the colour back in his cheeks after several tots of potent *frilm*, nodded slowly. "We did all we could, but they must have been instantaneously killed.

They were flung a long way from the shore, and the lagoon is deep and tidal. But we did not leave until we made sure. As for Gurdaan—it was no use following that thing with hand-guns."

Rathuris said: "Yes—of course. I should have taken more notice of Haruthis. But I did not bargain for such size—nor for carnivorous habits. It's a bad business." He paused, his mouth a severe line. "But there is other news for us all. I have received word from home."

There were fifty-six people—the entire complement of the *Sadur*—gathered in the saloon at the captain's summons. He faced them with calm expression and level quietness in his tone.

Without equivocation, he said: "Vadron is at war. The governments of the North and South Territories declared it some eighteen *laans* ago. Zana and Dhom-Zana have sustained raids from the north unparalleled in any previous conflict. Very little remains standing in either city. From the northern strongholds of Greva, Balseen, Phuza and Jhan-Kana, armies are sweeping south in the wake of air fleets of great range and power. The truce against the use of hyperatomic weapons has been broken by the northern dictatorship of Phuronis, and great areas have been drenched with radioactive gases and their populations destroyed. The Government of the South has quitted Zana for temporary quarters somewhere in Ramalia. There seems at present little hope of stopping the northern advance."

His voice ceased. The stillness in the long room remained for a few moments longer, then dissolved into a murmur of other voices.

While the shocked whispers continued, Gharru stepped to the side of Rathuris. "Our orders, sir?" he said in a matter-of-fact tone.

"Our orders," replied Rathuris, "are to remain here on Arlon until the situation is clarified. But should no further instructions be received within the limit of two full days, we are to return to Vadron immediately and place ourselves at the disposal of our Government wherever it may then be operating. The return flight is to be made in secrecy."

He paused as though in anticipation of a question. Then, as none came, he added: "This contingency was foreseen. I carry sealed orders relating to a rendezvous in the far south."

As he turned to leave his eye caught that of Doree. There was no perceptible signal exchanged, but she left the others without a word, following him on to the deck outside.

He looked at her, a little smile touching the corners of his mouth. He said: "Doree—perhaps you are wiser than you know."

She shook her head, not returning the smile. "I am thinking of Zana," she said, sadly. "Of our beautiful city."

"There is no profit in that," he told her. "There will be many cities, more beautiful than Zana, wrecked in this affair. Think rather of Vadron itself."

She raised her eyes to his. "It is—*so* grave?"

He nodded. "We *knew*," he said, quietly. "We knew that Phuronis intended

war, but we had no means of knowing the exact strength of his air units. Our dispositions were made on the assumption that his armies could be stopped on the borders of Homoria, well to the north of the Zanan defence lines. We also knew that if the Homorian barrier fell it would be long before he could be checked. If the Government has evacuated from Zana, it means that—"

He shrugged, looking over her head through the observation panels. The *Sadur* lay high on the shelving beach. To the horizon rolled the grey-green ocean beneath clouds darkening with twilight from the west. Eastwards stretched the steaming mysteries of the Arlonian jungles towards a dimly-seen range of mountains.

Rathuris looked again at Doree. "There will be terror over Vadron," he said. "Such terror and such destruction as she has never known. For the South will not negotiate with the North. Doree—I am afraid."

It was a simple statement, simply uttered. She smiled at him. "But you will return?"

"Of course—if there is a civilisation left to return to."

Her smile remained, and there was a depth in the eyes that turned from his to gaze at the darkling sea.

"I do not think," she said, "you *will* return. I do not think any of us will return —ever."

Somewhere, far out in the forest, a single high-pitched scream was the signal for a chorus of coughs, grunts and snarls that told of the coming night. Here and there the undergrowth shook to the passing of titanic shapes that squelched and splashed their way along the verges of hidden morasses.

Arlon fought a ceaseless, violent war of its own.

ALL THROUGH the night they waited for more news from distant Vadron. None came. Rathuris did not sleep, but spend the hours of darkness correlating and indexing reports. True to his interpretation of orders, he made no attempt to communicate with his home planet.

And throughout the *Sadur* were other sleepless people who gathered in the saloon, talking interminably to drown their agitation and anxiety; while in other quarters technicians checked and rechecked every minute part of a complicated space-drive mechanism, in readiness for the black ship's return plunge across the void. Astro-communications was an isolated nerve centre in which the tenseness of waiting could be felt. But no signal set the coils humming. Vadron was silent.

Dawn and the sun came together through a cloud haze that was thinner than it had been after the rain, and within two hours visibility was almost perfect under an aching blue heaven. The green of the jungle looked cool and deceptively peaceful, its luxuriance sweeping upwards from the gently lapping waves of an incoming tide. As far as the eye could see the green was unbroken, climbing persistently towards the dim purple of the crags on the eastern skyline.

At midday, with the Sun like a great brass gong hanging overhead, Rathuris took the *Sadur* upwards and eastwards from the shore, purring low above the cycads

and conifers as it made for the mountains. It travelled slowly, allowing Haruthis and his wife the fullest observational scope.

At a distance of some eighty or ninety miles from the foothills of the range a small, bare and almost circular butte rose from the forest's skirts. At the summit of its hundred foot walls was a plateau perhaps half a mile in diameter, its surface rough and utterly lifeless. Its isolation from the menace which they knew inhabited the forest swamps made it an ideal landing site, and upon its rugged tableland the *Sadur* came to rest on lowered cradles. There they waited for another night to fall over Arlon.

There was no longer any doubt about the first impressions of Haruthis. Arlon would not see the shaping of human life for many eons. It was a world of fang and claw—a world emerging from the seas of its first cooling—a world in which evolution had not yet wholly deserted the waters, and in which terrible things fought the battle of existence with things only less terrible than they.

There were gasps and murmurs of astonishment and repugnance as they watched the films taken by Haruthis during that afternoon's flight above the jungle roof. The swamps inland from the sea teemed with monstrous life; an abundance of terrifying forms whose size was almost incredible—bulks of scaly life measuring between eighty and a hundred feet from head to tail, wallowing and basking in the weed-choked water or browsing among rushy vegetation. Some even raised their giant structure upon hind-legs, grasping tree trunks with their forelegs while they devoured the foliage. Others still were plainly carnivorous, and although smaller than their herbivorous kindred, were yet as fearful to see. Swamp and jungle rioted in the sun, and over and through it flew and flapped and droned the birds and insects of an era of merciless elimination.

And then, as the sun went down below the rim of the western sea, they received a further message from their own world. As before, Rathuris assembled them in the saloon. His face was now very grave, and his words matched it.

"It has been found impossible to stop the advance from the North. The southern Government are rallying forces above and below the Ramalian border, but there is no doubt that the situation is exceedingly perilous. Even more desperate appears to be the fact that the unheeding liberation of atomic by-products is causing rapid destruction of human life in both north and south. The transmission from Vadron was broken for some unknown reason, but we begin the return voyage after sunrise to-morrow. I can give you no further information at present."

He paused in the doorway, looking round at the sober faces. Then he gave a little shrug. "Goodnight," he said, and left them.

THE WORLD was on fire . . .

Rathuris, thrown from his seat by the sudden pitching of the *Sadur*, got to his knees and shook his head to clear it from a daze of lights and sounds. Bruised and bleeding, his eyes registering nothing but a red glare outside his cabin port, he heaved himself to his feet and scrambled up a slight incline towards the door.

He moved in a daze, his mind groping for explanation.

Muffled by the stout hull plating of the vessel, sounds like the booming of mighty drums told of explosion after explosion, and over and above the crimson glare was a sustained roaring and hissing like the chorus of a thousand opened steam valves. As he reached for the switch operating the door's mechanism, he heard a new sound added to the tumult—the familiar throbbing of the *Sadur's* atmosphere motors. The inclined plane of the floor rose sharply to a level, throwing him against the door plates. At the same moment the light above his desk began to blink rapidly in an emergency signal from the navigation room.

He realised several things at once. He realised that he must have fallen asleep where he sat, and that the grumbling noises which had begun to wake him had been the first warning of what was now happening outside. He realised, too, that the glare and the roaring could mean only one thing; and he knew what that thing was even before he opened the communicator-circuit and heard Banlik's strained tones.

"Volcanic eruption, sir—the whole mountain's burst open. I'm taking her up, but I'm afraid she's damaged. Starboard stern engine-room doesn't reply."

Rathuris, wiping blood out of his left eye, snapped: "Good! Get her off the plateau somehow. I'm coming to join you."

Even as he staggered to the door again, his whole being sensed the wounded sluggishness of the black ship. She was floundering like a bird with a broken wing, moving as though her own weight were too great to be carried. His ears told him that only one of the motors was firing.

He ran down the corridor, his fingers feeling the gash in his forehead and pressing the edges together to slow the blood-gush. Gharru met him halfway to the navigation room. The second-in-command's face was white and there was a bruise on his jaw-bone.

"Stern cradle went, sir. Engine-room as well, I think. Gods—look at that!"

They had come out onto the starboard deck where a milling group of people shielded their eyes against the blaze beyond the panels. Doree broke from them, running to meet Rathuris. After her came Ferr. Rathuris reassured them with a word, and turned to look through the panels at a belching column of flame and smoke that filled the night sky.

The *Sadur* hung seemingly motionless a short distance from the edge of the plateau. The sheer rock wall facing them shimmered and glowed below the spouting fury that had burst outwards and upwards from a spot just under the summit to the left. They were so close that not even the solar-plating of the *Sadur* kept out the tremendous heat of the upflung molten rock that gouted skywards and rolled like a fantastic river down the mountainside.

The spectacle was both terrifying and fascinating. As they watched, half-blinded by the glare, a new whistling roar signalled the tearing apart of another section of cliff to the right of the first. The new vent burst open with a sound like a thousand heavy guns, and this time they reeled back from the augmented brilliance and the wave of heat that smote from it.

Suddenly, as though the explosion from the mountain had been the cue for it, another detonation from inside the *Sadur* itself caused the deck to leap and veer underfoot, flinging them down in a hopeless confusion of limbs. Yet another, lighter explosion followed, then a sound from the stern like crushing cardboard. The *Sadur* tilted steeply, her bows swinging up. The steady, comforting beat of her gyro-helicopters changed to a stuttering uncertainty. She began to drop towards the jungle, and over her slow descent the volcano spread a vast umbrella of ash and smoke.

Lit by changing tones of red, orange and yellow light, the jungle had the appearance of some strange hell into which the black ship was dragged reluctantly.

Rathuris, followed by Gharru, began to drag his way up the gradient of the deck . . .

"WITHIN FOUR *gaans* at the least, that lava will have reached us. We may as well face it—there is nothing to be done. My command is ended so far as this ship is concerned. Repairs in time are impossible. We cannot move; we can only abandon her."

Forty faces in the saloon held the same realisation of disaster that was conveyed in the curt words of their captain. Rathuris, suited and helmeted from an exterior inspection among falling sparks, had given them a precise, truthful account of their plight. And that plight was desperate.

The *Sadur* had been within a hundred yards of the first eruption. The sliding, fissuring rock had thrown her violently sideways, completely destroying her stern cradle and tearing off the plating of the engine-room, killing and crushing the seven men within. The fusing of circuits had resulted in a fuel explosion in the corresponding chamber. Nine others had perished in the vicinity of the burst, one of them a woman.

The gyro-helicoptic circuits had been impaired and the complicated mechanism was hopelessly fouled. The space-drive could not be used, because there was no way of sealing off the riven hull. In any case, without the initial lifting function of the helicopters, the rockets were useless.

The crippled ship lay listing in the jungle fringe about a mile from the lower slopes of the volcanic mount, and full in the path of a river of glowing lava that rolled forward with no sign of stopping. It was certain that within a comparatively short time it would reach and engulf the *Sadur*. Evacuation was the only answer—evacuation through nearly a hundred miles of swamp and jungle to the mountains to the eastward. For the mountains offered the only refuge from the gigantic terrors of the forest valleys. And not one of them could underestimate the hazards of that enforced trek.

There was another thought in every mind. Rathuris gave voice to it.

"We must regard ourselves—temporarily, at least—as men and women without a country, without a world, of own own. I have sent a message to Vadron describing the present situation, but Vadron does not reply. In all probability,

there is now no regular contact between Vadron and ourselves. In the first shock of the eruption much of the delicate apparatus was damaged, and although we have used full power on emergency equipment there is no guarantee that our message was received and no guarantee, either, that Vadronian sources were on hand to receive it. That is a hard fact which we also must face, with as much resignation as possible. It would be useless for me to conceal from you that our failure to return will be interpreted in one way only."

His face, through the open visor of his helmet, was adamantly set. "My friends, we are alone on this world of Arlon, and from it we must extract a destiny which may, as I said, be temporary, but which may equally be permanent. I think—I think we must regard Arlon as *our* world, from now on."

Gharru said, quietly: "Then, sir, you do not anticipate that Vadron will equip an expedition to search for us if we do not return?"

Rathuris shook his head. He was looking at Doree.

"In time of war?" he questioned. Then: "Even if we are remembered on Vadron when it ends, it would be long before such an expedition could be chartered. Arlon is a big place—they might search for years and never find us. Our reports on the present condition of Arlon will, in any case, not encourage such a search." His mouth had a satirical smile. "No," he finished, "I believe we must regard ourselves as Arlon's first citizens. And there is not a great deal we can take with us to our heritage save our traditions—and our determination to build a future here."

Doree said: "That, of course, we shall do—somehow—if we survive."

No one echoed her words, but in the very silence was agreement.

Rathuris turned to Gharru. His voice was crisp again, crisp and certain. "There are things to do," he said. "We can salvage every possible piece of portable equipment—food, weapons, apparatus. Everyone must help."

Less than a mile away now, the lava flood rolled on, widening as it reached the mountain foot, flaming and shining in the darkness like a serpent of fire . . .

THE GREY bulk, its serrated dorsal plates swaying under the amazing speed of its rush, screamed the challenge of the everglades. Its toothed jaws snapped in a lowered head, and from its thundering path the birds flew away, squawking and crying.

The column broke before the onslaught; broke and scattered as they had learnt to scatter many times during the past three days. Loads were dropped, and their bearers fled from the direct path of the charge to the cover of fern thicket and reed patch. Only here and there did a man stand firm long enough and calm enough to raise the tube of his squat *lithi*-gun, with its crackling white electronic burst that sheared through the armour of the stegosaur, bringing roars and squeals of pain and rage frightful to hear.

Hit by a dozen *lithi*-shots, the monster, its sluggish nervous system not yet fully affected, came on in its titanic rush. The gunners now broke, leaping and scrambling to right and left, and the ground shook as the charge passed them by

yards only. Twenty-four men and ten women hugged their respective cover, still and silent.

Behind, them, suddenly, was a crashing and cracking of tree trunks as the stegosaur pitched sideways on its short forelegs, ploughing up earth and foliage. For a few moments it fought to rise again, its head up, fangs snapping at the air. Then, as the slow nerve shocks reached heart and brain, the great grey body quivered and swayed and tilted, crushing down fern and cycad sapling as it fell.

The scattered gunners came to their feet, circling the twitching mountain of armoured flesh well out of reach of the jerking tail. They did not fire again, but merely waited. Under their protection, the column began to re-form, each member of it taking up his or her burden where it had been dropped.

They were learning how to survive in this jungle of sudden death. Huge fires by night, constant watchfulness by day, a weapon screen to front, rear and flanks —predetermined action and organisation. With this they could win through to the high ground of the mountains; without it they were merely prey for the swamp life.

With Rathuris, they had been forty-one in number when they had started from the wrecked *Sadur* in the first light of dawn, three days ago. They had

skirted the oncoming lava tide and pushed hard through acrid smoke for the first few hours. The initial stages of the journey had been easy, since all bird and animal life had deserted the vicinity of the volcano. But on the second day, six of them lost their lives by the edge of a reeking swamp when the waters broke and a great, snakelike head reared out of the mists. They learned, then, to make detours of any swamps that barred their way.

On the morning of the third day, an advance gunner writhed in agony from the bite of some unknown insect upon an incautious hand. They learned to keep every limb well-covered. But the going was, on the whole, not difficult. There was plenty of hard ground interspersed with the marshes, and allowing for temporary stoppages and detours, Rathuris expected to be out of the forest country within another four or five days.

The nights were the most nerve-wracking experience of all. Crouched beside their leaping fires, they listened to the screaming and crashing of great beasts behind the encircling darkness. Once or twice they caught sight of huge shapes passing their fire ring, and heard their inquisitive grunts and whistles. They slept hardly at all, but waited in an agony of suspense for the coming dawn.

The fates were with them through the nights, however. Even the frequent rains held off after darkness. Not every beast they encountered was harmful, and some were so timid that they would blunder away in obvious fright. Others, even among the herbivores, showed a spite every bit as malicious as their perpetual enemies, the flesh-eaters. They learned to distinguish between them, killing at once before they could be killed.

So they fought their way steadily towards the growing outline of the range, carrying with them through the green humidity of the jungle all they could from the doomed *Sadur*. They had transferred other stores to a spot which they estimated would be missed by the lava flood, and volunteers would later essay the jungle hazards again in order to rescue these, too. At the moment it was all-important that they should travel as light as possible. Rathuris wished to get the women to safety.

Now, as the *lithi*-gunners at last stepped back from the carcase of the stegosaur, he looked back along the column. He called a question that had become a routine.

"All present? No injuries?"

The answering chorus reassured him. He waved an arm. The column moved on, and this time they passed through thinning undergrowth to the edge of a four-mile expanse of rocky plain, dotted here and there with groups of rough herbage. Beyond it rose the mountains out of the mists of another tract of jungle.

DOWN BELOW, where the shale slopes began, the jungle ended, the basin of it now black with shadow and now silvered by the moon that had risen over the ranges. From it, heard faintly on the plateau's edge, came the sound of its night denizens.

Rathuris, tall and silent in the moonlight, stood apart from the fires of their

first encampment since winning free of the forest that morning. His expression was unreadable as he stood there at gaze. Behind him was the murmur of voices, and even occasional laughter.

The laughter brought a grim little smile to his mouth. It meant so much that was inexpressible—reaction, felt security, encouragement, hope—most of all, hope. It meant that the gift of life was recognised, that life was itself again, stirring out of nightmare to a realisation that it had conquered thus far.

Thus far . . . Rathuris started suddenly at the light touch of fingers on his arm. Doree . . . The girl held up perfect lips for his kiss. Rathuris, himself conscious of salvation achieved, smiled at her. His arm around her shoulders pressed hard.

"You are tired," he whispered. "Why do you not try to sleep?"

She said, simply: "There are too many thoughts."

He nodded slowly. "Ay, there are too many thoughts. But out of the thoughts we must forge reality—forge it and face it. We are thirty-four people against a world not even prepared to receive us. Vadron must be for ever a dream and a memory. Arlon is a challenge."

"It is a challenge we shall accept," she said.

"It is a challenge we *must* accept."

For a moment his features were etched hard in the suffused light, hard and unyielding as the line of peaks against the sky. Looking at him, her heart stirred. Rathuris had the spirit of his ancestors, princes of the ancient war-city of Zana for thousands of years. And because she loved him, and because she too came of a warrior line, that strong spirit of his thrilled and uplifted her.

"We are not helpless," she replied, softly. "We have the scientific intelligence and some, at least, of the needed tools. Ferulus already has plans." She laughed. "Ferulus always has plans, and he is only one. We will build—never doubt it. We will build as well as we can. And after . . ."

"After?"

"There will be sons and daughters—a new race. We must teach, beloved, as well as build."

Rathuris smiled at her with full understanding. Against his shoulder her head came to rest. In the moonlight, very gently, his lips touched the dark beauty of her hair. Behind them the fires glowed—phœnix fires . . .

The moon looked down.

Mr. Bulton, at the end of his discourse, smiled.

"So, you see," he said, "it is really impossible to set an exact date for either the beginning or end of Atlantis. It could very easily be a deeply submerged race memory."

He thought for a moment, and then smiled again. "It would be strange, would it not, if Atlantis was not even of earthly origin? It has been wondered whether it might not have originated with the creatures of another planet—perhaps Mars, whose evolution would in prehistoric days have been greatly in advance of our own."

He rose, looking at the class-room clock. "Think it over," he said. "It might have been. It might have been a kind of—of Martian mandate."

SCIENCE-FANTASY REVIEW

Vol. IV, No. 20
WINTER '50

The Dawn of Space-Travel

By VALENTINE PARKER

SOME MONTHS ago the Hayden Planetarium in Manhattan put on a special show entitled *The Conquest of Space*. To give it proper publicity, the public were invited to fill in "Interplanetary Tour Reservation" forms indicating if they wished their names to be filed for a passage—when available—to the Moon or one of the planets. They were also issued with cards giving a "Spaceship Time Schedule," from which they could extract the information that a trip to the Moon would take only nine and a half hours as against seventy-five days to Mars and some four years and two months to Saturn. To complete the gag, they were advised that the organisers "cannot be responsible for delays *en route* caused by meteor showers or other phenomena."

If we are to believe the newspapers, the American mind is now so attuned to the concept of space-flight that it refused to treat the possibility of reserving a berth on a space-vessel as entirely remote. According to report, more than 18,000 people filled in the forms or asked for further information; and some gave their reasons for wanting their names put down. One was interested in building a hotel on the Moon to accommodate tourists, for which another wanted to cater by securing a concession to sell them hot dogs and lemonade. Somebody had visions of a skating rink on Venus, and a singing cowboy saw the chance of getting in on the ground floor of radio business there. So intriguing was the overall response that it provided a profitable study for a trained psychologist, to whom it was soon obvious that the majority just wanted to get away from this wretched Earth . . .

To the British public, too, the idea of space-travel is no longer completely fantastic. Thanks to Mr. Arthur C. Clarke, a stalwart of the British Interplanetary Society—and a contributor to SCIENCE-*FANTASY*—a million televiewers in this country have become fairly used to the subject, which is treated as newsworthy by Fleet Street almost daily. And overwhelming evidence of the extent of the current interest was provided when two Hollywood films which dealt seriously with the theme—or tried to—recently vied for the public eye. Though it wrongly claimed to relate "the screen's first story of the conquest of space," *Rocketship X-M* —subtly sub-titled *Expedition Moon*— contrived to make its appearance shortly before its rival, and was fairly well received by all who saw it. But, judged by all standards of film technique and intelligent treatment, *Destination Moon*, a far more ambitious production, was unquestionably the more successful.

Both films opened in remarkably similar fashion—with a visionary scientist about to embark on what even the most timid sceptic is now inclined to accept as the next great enterprise of Man, the voyage to the Moon. *Rocketship X-M*, however, soon strayed from its intended course: instead of completing Expedition Moon, Dr. Karl Eckstrom and his four fellow pioneers finished up on Mars, to encounter the rock-throwing remnants of a race reverted to

savagery by the calamitous aftermath of atomic war. The moral was there; so was the story, even if this was slight; and the presence of Osa Massen as a charming chemist added a touch of the romantic appeal the cinema public loves so well. But the succession of astronautical and astronomical boners, which provoked uncontrollable laughter among them, rendered the film hardly acceptable to the BIS experts who previewed it.

On the other hand, even the most demanding of them were ungrudging in their approval of *Destination Moon*, which had been several months in the making instead of only a few weeks. No pains had been spared in the attempt to instil into this a verisimilitude which would justify its description as a semi-documentary film. The story, based on a novel by the well-known science fiction writer, Robert A. Heinlein*, who participated in the writing of the script, was simplicity itself: it did no more than anticipate the undertaking of the Moon-rocket project as a combined effort of American industry, and carry it to as logical a conclusion as was consistent with dramatic requirements. But the genuine astronautical interest, incidental suspense and thoroughly realistic effects achieved by the team which assisted producer George Pal (pioneer of Puppetoons) and director Irving Pichel in pulling off what was really an extremely difficult feat—to present the subject of space-travel plausibly, accurately and entertainingly to an audience more used to regarding it as "Flash Gordon" stuff—kept everybody on the edge of his seat wherever the film was shown. Far from proving too fantastic for the notoriously conservative cinemagoer, it attracted tremendous queues and made big money both in this country and in America.

The incredible physical effects of space-flight, the dilemma of an astronaut floating helpless in a gravityless void, and the problem of getting a spaceship off the Moon with barely sufficient fuel, were all depicted as convincingly as the awful immensities of space and the weird landscape of the satellite, with the help of ingenious models and tricks of cinematography which had been most carefully devised. Technicolor was able to do justice, not only to the varicoloured space-suits of Dr. Charles Cargraves and his crew (a device to assist identification), but to the sombre tintings of the Moon's rocky surface and the glories of the star-spangled sky. (Though the explorers claimed the new territory in the name of the United States—the only jarring note in the film—we were spared the planting of a star-spangled banner).

The studio sets which effected this miracle of transference were designed by Chesley Bonestell, who is as well-known to science fiction followers for his magnificent paintings as is Heinlein for his stories. A former staff artist for the *Illustrated London News* who found his type of work peculiarly suited to Hollywood, Bonestell's life-long interest in astronomy has afforded him ample scope for his genius in visualising and depicting the alien features of other worlds, in which he combines a photographic clarity with a fidelity which render them equally satisfying to the dreamer and the scientist. His imaginative projections have appeared of recent years in many magazines, from *Astounding Science Fiction* and *Air Trails Pictorial* to *Life* and *Coronet;* and the best of them have now been assembled in a volume which presents a colourful panorama of the planets as they might—as doubtless they will eventually—be viewed by space-explorers*.

The Conquest of Space is, in effect, a sort of anticipatory Pictorial Guide to the

ONE of the liveliest features of *Science-Fantasy-Review* was *FANTASY FORUM*, where readers expressed their views on all matters pertinent to its field. It is hoped to continue this feature in future issues. If you have any comments to make on the contents of this magazine or on any matters arising, send them to The Editor, SCIENCE-*FANTASY*, 25 Stoke Newington Road, London, N.16.

*See "A History of the Future": *Science-Fantasy*, Summer '50.

**THE CONQUEST OF SPACE.* Paintings by Chesley Bonestell; text by Willy Ley. Sidgwick & Jackson, London. 18s.

Solar System; a book which is not only "out of this world" but out of this century, and one which must prove irresistibly fascinating to the science fiction reader who is also a believer (and how can he be otherwise?) in the future of space-flight. Bonestell's marvellous pictures of the Earth, the Moon and the other worlds—of which there are 48 pages, a quarter of them in colour—are so perfectly reproduced that some of them make one gasp at the amazing realism of their strange beauty. The mountains of the Moon in the rosy glow of a Solar eclipse; the glare of Mercury's sun-drenched surface; the weird dust-bowl of Venus; the glory of a Martian sunset; the awe-inspiring sight of Saturn from one of its moons . . . the succession of unearthly scenes makes the mere turning of these pages a rare experience.

There are also 102 pages of text and diagrams by Willy Ley, whose writings on astronautics have been familiar to readers on both sides of the Atlantic for many years, and whose early work in this field went towards the inspiration of the famous German film of 1929, *The Girl in the Moon*. His simple presentation of the problems involved in reaching that jumping-off place for journeys to the planets, followed by his descriptions of the Solar family—not forgetting the planetoids—may be appreciated by the most uninstructed reader; so easily, in fact, that at the time the American edition of this book appeared the London *Daily Express* saw fit to present an abridged version of them as a three-day serial illustrated by Bonestell's pictures. But these must be seen in full detail, and in colour, to be properly appreciated—which is why everyone who has a glimpse of them wants to carry them off to stare and stare again at the beckoning vistas of Man's empire of tomorrow.

SMALL ADVERTISEMENTS

Special rate to collectors: 4d. per word (10c. Canada and U.S.A.); minimum 12 words. Trade rate: 6d. per word (15c. Canada and U.S.A.). Box numbers count as two words. All advertisements in this section must be prepaid.

WANTED: "My Best Science Fiction Story" (Merlin); or will swap for "The Best in Science Fiction," mint for mint.—Box 142, *Science-Fantasy*.

SCIENCE-FANTASY REVIEW: Nos. 16, 17 and 18 still obtainable at 1/1 post free; also Nos. 1, 7, 8, 9, 10 and 11 at 7d. post free. Secure your missing numbers now, before copies are exhausted.—115, Wanstead Park Road, Ilford, Essex.

COLLECTOR wants Sturgeon's "Without Sorcery," del Rey's "And Some Were Human," Heinlein's "Space Cadet" and "Rocket Ship Galileo." Will exchange for British books; send wants.—Box 140, *Science-Fantasy*.

SCIENCE FICTION, FANTASY books and magazines, British and American; write for free catalogue.—S-F Service (Dept. FR), 68 Victoria Street, Liverpool, 1.

JOIN Britain's only Society for science fiction readers — The Science-Fantasy Society. Details from F. R. Fears, 6 Ferme Park Mansions, Ferme Park Road, Crouch End, N.8.

EXCHANGE "Midnight Reader" (Holt) for "Sleeping and the Dead" (Pellegrini) or "Revelations in Black" (Arkham).—Box 143, *Science-Fantasy*.

WANTED: Clayton *Astoundings* and *AS-F* 1940-50. Good condition essential. State price.—Box 144, *Science-Fantasy*.

ENGLISH collector has following British volumes to exchange for wanted American books; send list. "Terrible Awakening," Desmond; "Heaven Takes a Hand," "Man Who Met Himself," Williams; "Spurious Sun," Borodin; "Address Unknown," Phillpotts; "Gale of the World," Kirk; "Toby Jugg," Wheatley; "World Below," Wright; "The Flames," Stapledon. All excellent condition, with jackets.—Box 141, *Science-Fantasy*.

FANTASY BOOK CENTRE

offers the latest Books and Magazines and a first-class

GUARANTEED LIBRARY SERVICE

● **A brief selection of the latest books for sale:**

THE CONQUEST OF SPACE by Willy Ley, illus. Chesley Bonestell —First British edition, with colour plates 18/–

WORLDS IN COLLISION by Immanuel Velikovsky—A new theory of the universe. First British edition 15/–

THE CASTLE OF IRON by L. S. de Camp & Fletcher Pratt (Gnome) —Whacky adventure in simultaneous worlds 16/6

MINIONS OF THE MOON by William Grey Beyer (Gnome)—Inter-planetary adventure novel 16/6

BEYOND TIME AND SPACE Ed. by August Derleth (Pellegrini) —Brilliant new science-fiction anthology 30/–

THE BOWL OF NIGHT by Edward Liston—Superbly-written fantasy of a lost civilisation 8/6

THE STRANGE JOURNEYS OF COLONEL POLDERS by Lord Dunsany (who needs no further comment) 9/6

CONAN THE CONQUEROR by Robert E. Howard (Gnome)—A tale of breathless mythical adventure 18/6

COSMIC ENGINEERS by Clifford D. Simak (Gnome)—Super-scientific space adventure 16/6

MEN AGAINST THE STARS Ed. by Martin Greenberg (Gnome)—A superlative anthology of modern science fiction 19/6

I, ROBOT by Isaac Asimov (Gnome)—A selection of amazing "robot" science stories 16/6

JOURNEY TO INFINITY Ed. by Martin Greenberg (Gnome)—A new anthology following the success of 'Men Against the Stars' 23/6

EARTH ABIDES by George R. Stewart—First British edition of superb 'end of civilisation' novel 12/6

OTHER SIDE OF THE SUN by Paul Capon—A brand-new British science fiction interplanetary novel 10/6

● *SPECIAL—Subscriptions to all U.S.A. magazines may now be placed.*

Complete details, with interesting book list, free and post free, from

FANTASY BOOK CENTRE

25 STOKE NEWINGTON ROAD, LONDON, N.16

Telephone: CLIssold 5541

OUT SOON—The Spring 1951 issue of the popular Nova Publication

NEW WORLDS

No. 9
1/6

featuring

AND ALL DISASTROUS THINGS by **A. Bertram Chandler**, NO PLACE LIKE EARTH by **John Beynon**, LIFE CYCLE by **Peter Hawkins**, MANHUNT by **Cedric Walker**, BALANCE by **John Christopher**, etc.

Order your copy from your newsagent NOW. In the event of difficulty, write to the publishers:

NOVA PUBLICATIONS
25 STOKE NEWINGTON ROAD, LONDON, N.16

GRIPPING : FASCINATING : MEMORABLE

Astounding

SCIENCE FICTION

9D

ON SALE EVERYWHERE