

WHICH
WAY
WILL
SCIENCE
TAKE
THE
WORLD?

OF MOLECULES MEN AND GOD

DR H A C MCKAY, pioneer atomic scientist

Dr McKay was among speakers at a meeting last weekend in the Westminster Theatre Arts Centre on 'Which way will science take the world?' Extracts from other speeches are published on page 2.

WHEN I WAS AT OXFORD in the thirties many of my contemporaries were enthusiastic about what they called 'the Russian experiment'. I think that for many of them the basic appeal lay in the belief that Marxism had found the secret of dealing with human nature. Change the economic system, and people will become unselfish. After the transitional period of state control, a new type of man will emerge and the state will wither away, leaving us with a wonderful new world where men treat one another like brothers.

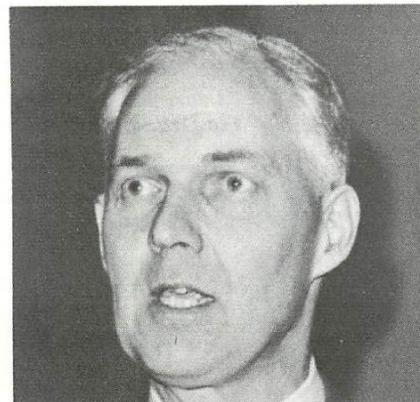
Somehow over the years the vision

has faded. The other day I came across a brief quotation from an official Russian news agency—and it is not an isolated example. It reads as follows:

'Where can one find the invisible spring that changes human nature and relationships between people?'

Apparently the Russians too are looking for the secret.

Some of you may say that if Marxism has failed we should turn to capitalism. Well, capitalism is an economic system, with some virtues and some defects, but even its protagonists



hardly claim that it generates unselfishness in people.

Where then does the philosophically-minded materialist now turn?

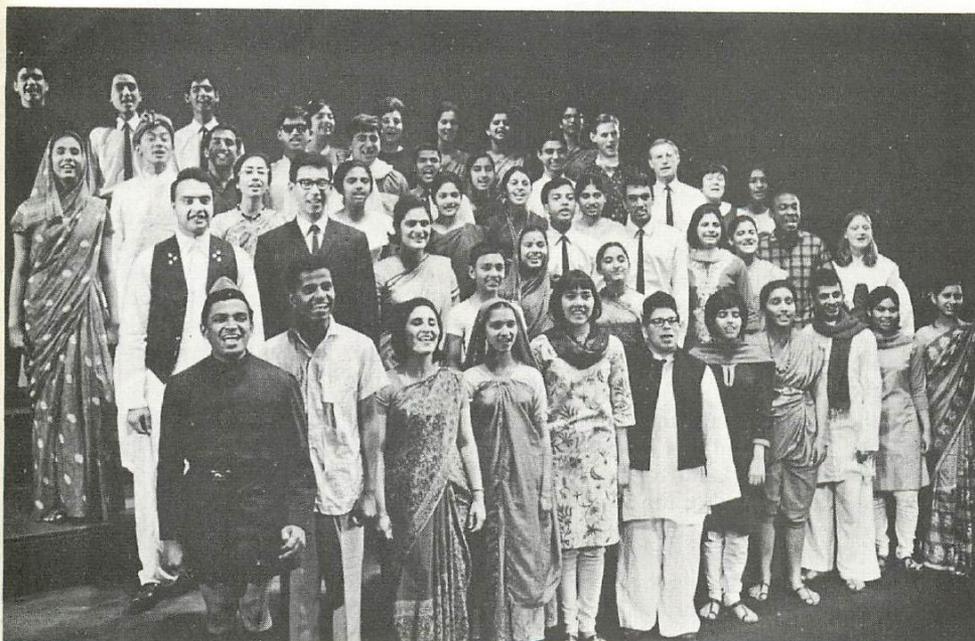
What I believe is beginning to happen is that a new materialistic creed is evolving on the basis of recent discoveries in biology. In a lecture given in Washington the Nobel prizewinner, Francis Crick of Churchill College, Cambridge, said:

'Once one has become adjusted to the idea that we are here because we have evolved from simple chemical

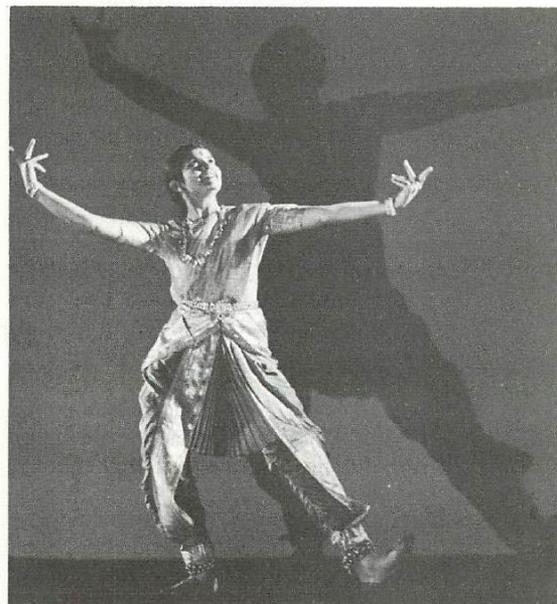
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'INDIA ARISE' OPENS IN THE WESTMINSTER THEATRE 27 JUNE

The cast and Vijayalakshmi Subramaniam



photos Channer, Mulder



SPEND MONEY HOW?

BY AIR VICE-MARSHAL
NIGEL BLAIR-OLIPHANT
a former President
of the Ordnance Board



IF YOU had £400 million what would you spend it on? This is what it has cost the Chinese to develop their nuclear weapon. They have done it the quick and expensive way and it has cost them about £400 million to set up the research and the plant to do it—this is before they start producing the weapons.

Four hundred million pounds was spent in five days in the Arab Israeli war on the equipment that was destroyed or lost in the desert.

We pay as a nation for our nuclear deterrent policy £400 million in a two year period and I am grateful that we have been paying for it for twenty years. It has been a factor in preventing war in the world.

Let us go down a little lower because not all of us have £400 million. Let us take one thousandth part of it. For £400,000 you get a Westminster Theatre Arts Centre. Think of the dramatic weapons this centre can produce and the effect of their fall-out in the world.

Think of £40,000—the cost of producing the film *Give a Dog a Bone* and sending it around the world. Forty

thousand pounds is what we will have to raise for filming *Happy Deathday*.

We are always concerned how to keep weapons up to date, and how to modify them.

Freedom is a marvellous film. To have it modified, translated into Swahili for Kenya distribution, cost £4,000. It could be shown then to over a million in Kenya. Members of the Kenya Cabinet say that the showing of this film saved Kenya from internal strife and bloodshed.

Forty thousand pounds is the cost of bringing *India Arise* to Europe. Now there is a weapon, a force of young men and women, modern men. They are free and fearless. They are an inspiration and challenge to everybody who meets them.

We need to raise the money to support this force, which in fact I believe takes greater responsibility for our country than many of our leaders do. *India Arise* is a weapon, available, sharp and ready. Our task now is to put it into action so that it reaches every target in the nation where it can give the inspiration, challenge and change we need.

PRESERVE LIFE FOR WHAT?

BY DR ERNEST CLAXTON
who retired as Principal Assistant
Secretary of the British Medical
Association, December 1965

I ADDRESSED recently a symposium at the London Hospital on the preservation of life. This is a problem that the doctors are facing now in greater urgency. We can keep the heart and lungs going when consciousness is lost. We can transplant organs. It will not be long before we can make that permanent. There is the possibility of transplanting a heart, even the brain is being considered, though this is unlikely.

This symposium was of scientists, doctors and lawyers from both sides of the Atlantic. It so happened that I was the last speaker. I don't know whether it was by accident or by design. But I said, 'I can't add anything to this problem which you have been discussing, but I can ask you another



question. What do you do with life when you have got it? What is it for?'

This is what we in medicine have got to face. What do we keep people healthy for? What do we restore them for when they are ill? It is not enough just to get rid of pain or disability—desirable as that may be. And the compassion which is needed to do it is essential.

I gave them three points for purpose and meaning in life. And this is Moral Re-Armament. (1) To hand on better than we receive. (2) To care for people—that is their emotional, their social and their material needs. (3) To cooperate with nature. You can call it nature if you are an agnostic. You

can call it God if you are a believer. I am a believer and I believe that to cooperate in the working of God's plan is the most satisfying thing of all. Through Moral Re-Armament we have a programme of personal change, social change, national change and international change. This is what we are meant to be doing all the time.

How can it happen? My particular responsibility is the field of medicine. Recently I had the privilege of leading a deputation of doctors to give evidence to the Royal Commission on Medical Education. They were discussing medical curricula. We had the opportunity of expressing to the Commission these points.

We said that doctors need to learn how to answer the emotional needs of people, change the attitudes and motives of people, so that they become reconciled to each other. This will reduce fear, anxiety and resentment—the things that kill us.

If the medical profession will take on the Moral Re-Armament of the world I believe there is hope. We cannot do it alone. We need the help of the social worker, the theologian and of the patients themselves. With this aim and experience we have something valid for the whole world.

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compounds by a process of natural selection, it is remarkable how many of the problems of the modern world take on a completely new light. It is for this reason that it is important that science in general, and natural selection in particular, should become the basis on which we are to build the new culture.'

That may sound fairly innocuous, but then he also says of people with training in the arts that 'tomorrow's science is going to knock their culture right out from under them', and of religion that much of it 'from the point of view of most educated men, it utter nonsense'. Crick stands out because he is a militant—he fought to prevent Churchill College from having a chapel—but there are others who hold the same views. These views are founded on some of the most extraordinary scientific discoveries, made mostly in the period since the war. A new branch of science has come into being, known as molecular biology, and it has been tackling the very core of life itself.

NATURAL OR SUPERNATURAL

Now life—the existence of living things—is a challenge to the materialist. It is a challenge because life is the vehicle of everything we call Spirit. The materialist feels a powerful compulsion to explain such things away. It is important to him to establish, first, that the origin of life is natural and not supernatural, and secondly, that life can be fully explained in the same terms as inanimate matter.

These are important scientific questions in their own right, and you do not have to be a materialist to be interested in them. Yet it is true that quite a lot of the drive in tackling them has come from men who are militantly atheistic. Fascinating discoveries are in fact being made.

Let us look first at the problem of the origin of life. The earth's oldest rocks solidified about 4500 million years ago, and some time after that life appeared on the planet and the

slow process of evolution leading to Man commenced. Fossils provide us with a record of the evolutionary process. It is a record which becomes clearer and clearer, the closer you come to the present time, and contrariwise becomes vaguer and more elusive when you try to track it back to its beginnings. Animal bones and shells and woody plants produce fossils readily recognizable by the naked eye of the amateur, but these come from relatively complicated forms of life. Before that there were much simpler forms whose fossil remains can only be seen under a microscope.

The oldest definitely identified fossils come from the northern shore of Lake Superior in North America. They consist of minute spheres and filaments and are believed to be related to modern seaweeds. They are approximately 2000 million years old.

WORLD WITHOUT OXYGEN

There are other discoveries in Minnesota and Swaziland which are estimated to be respectively 2700 and 2400 million years old, but it is not certain that they are fossils. There is doubt, that is to say, whether the structures observed really do originate from any form of life.

It seems unlikely therefore that the fossil record will ever show us the very earliest forms of life, so we must fall back on other lines of attack. What we can do is to ask ourselves what the earth was like in those remote epochs, and what chemical and other processes might have gone on.

The picture we get is rather surprising. It is of a world where you or I could not survive for a moment. There would be no oxygen in the air for us to breathe, and nothing in the atmosphere to protect us from the short-wave ultra-violet light from the sun. Indeed if it were not for the sea, where the water protects against the ultra-violet, life would hardly have got started at all.

The atmosphere at that time is believed to have contained large amounts of the gases ammonia and

methane. Ammonia will be familiar to you, and methane, I may remind you, is the principal constituent of North Sea gas. This mixture of gases would be exposed to intense ultra-violet light, and probably too to the effect of electric discharges in the form of lightning flashes. Under these conditions, with water present as well, all sorts of chemical processes would be expected and a great variety of chemical substances might be found. The oceans, it has been suggested, might have become a sort of 'protein soup'.

Here now is something we can test. We can go to the laboratory and set up conditions like those I have just described, and see what happens. This has fairly recently been done, and some quite complicated substances were produced. Nothing actually alive was formed—that would have been too much to hope for—but a lot of the materials necessary for the maintenance of life were found.

From this it is but a step to argue that if the oceans were a protein soup, then over a very long period of time, still more complicated substances and structures might have been produced, leading ultimately to living things. And once the first living thing that could reproduce itself had been formed it would have multiplied in the primeval ocean like rabbits in Australia because there would have been virtually nothing to stop it.

KNOWLEDGE GAP

What is difficult about this is to fill in the intermediate stages at all plausibly, if we simply start from the protein soup idea. To make much headway we need guidance from the other end, from our knowledge of what life is actually like.

This brings me to the second of the two problems I posed earlier: can life be explained as a matter of mere physics and chemistry, or is there something more to it?

I would like to give you just a hint of recent discoveries. To operate some computers you use a tape with

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continued

punched holes all along its length. As the tape moves through the computer, the computer takes its instructions from the message in the punched holes.

Now the point is that there are substances in living cells that are like these computer tapes—very long molecules, carrying instructions all along their length. They are called DNA molecules. The instructions are carried in a sort of Morse code, only instead of dots and dashes there are four types of small molecules attached to the backbone of the long molecules. The instructions control what the cell does. It is in fact the instructions stored in the DNA molecule of a human germ cell that decides sex, hair colour, certain criminal tendencies, and other characteristics of the person that will grow out of that germ cell.

MINUTE BLUEPRINT

The amount of information stored in a human DNA molecule is fantastic; it is far more than on the longest computer tape. There is enough to write a 500-volume encyclopedia. After all, a human being is pretty complicated, and a constructional blueprint with all the necessary details must cover a lot of ground. Yet it is all packed into a single living cell, a minute fraction of an inch across.

It is a remarkable thought that each person has his own particular kind of DNA molecule, containing his own particular store of information, which controls his body from conception to death. You can almost say the DNA molecule *is* the person. The final result depends, of course, on environmental influences as well, but I need not go into that now, beyond saying that DNA certainly does not determine *everything*.

My main point is simply that in material terms we now have a picture of the processes of life itself, including human life. That is to say, we know in broad outline what the atoms and molecules inside the living cell are doing. So far we are at the learn-

ing stage, but if the history of science is anything to go by this will be followed by a stage of application of the new knowledge. It is often said that knowledge is power, and knowledge of molecular biology may put extraordinary powers in mankind's hands.

FORETASTE OF FUTURE

I came across one simple example the other day of what may be possible, in a magazine called *Chemistry and Industry*. There was an advertisement by a well-known firm of instrument manufacturers, and this is how it begins:

'This woman's child will be a girl . . . with green eyes and auburn hair. This is the kind of statement which could be commonplace in the next decade or so. A statement which could be made as the result of the analysis of the DNA cell taken from a smear from the uterus . . .'

Now that advertisement was not addressed to the general public, but to scientists, so the advertisers had to stay within the bounds of scientific possibility. They gave a foretaste of the new kind of world we are moving into.

HEREDITY CONTROL?

Looking rather further ahead we can imagine making DNA molecules according to patterns of our own choosing, or at least modifying existing DNA molecules. If such a DNA molecule was introduced into a germ cell it would control the development of the body and brain that grew from the germ cell. We should have heredity control. It might even be possible to obtain a crude sort of control by merely taking pills of suitable substances.

I do not want to suggest that this kind of thing is just around the corner, but rather that we are on the threshold of a strange and rather frightening new world.

Peter Howard's play *Happy Death-day* is concerned with that new world

and with the shadows it casts over our present world. It is set against a background of the discoveries that I have been describing, one of the principal characters being indeed a molecular biologist—whom I think it is fair to describe as intoxicated by the vistas he sees ahead of manipulating and controlling human beings through the molecules, the chemical processes and the electric current in their bodies.

From the questions that came my way and from the things Peter Howard said in his speeches, I know that he took considerable trouble to acquaint himself with the ideas that the biologists are bandying about, and that he was deeply perturbed by their implications. He was a man who was always looking ahead, and he knew that an idea that seems innocent enough now may be the precursor of a far more menacing idea in the future.

He said that if we are *nothing but* atoms and molecules, if there is no other kind of reality in the universe, then in the last resort there is no criterion of right and wrong, and no check on how we use the vast new powers science is giving us. In one of his speeches he says:

'People who worship the human brain are also prone to worship the human body and to put Almighty Man before Almighty God. And that is the start of the end of freedom.'

He goes on to speak of 'the treatment of men as machines and the control of the machines by master men'.

ISSUE FOR EVERYONE

The issue, at root, is whether man's brain or God's will is going to run our affairs. This is an issue for everyone, not just for the scientist or the people who seem to be brainy. To play god is a temptation that comes to everyone, and in the end it leads to disaster. Equally, to work with God to build a better world is a choice that anyone can make. Those who do can guide mankind in grappling with the strange problems science is beginning to put before us.

THE CHALLENGE OF 1967 TO THE FILM INDUSTRY

An Article in *Cinema Internationale*, an international film review, published in Switzerland

FOR THE FIRST TIME Hollywood and the USSR are going to cooperate on an important film. If this production is a success, serious efforts will follow, not only for an increase in the exchanges of Russian and American films, but also for the joint production of other films. Now that this door is opening, what do the two parties have in mind about the ideas which will be poured on the masses?

During this year's Soviet Communist Party Congress, the Secretary of the Film Workers' Union declared that Russian films are the most effective weapon in the Party's ideological armoury. He emphasized the need to make full use of the great educational power of films at the present time when the struggle between the two ideologies—Socialist and Capitalist—has become more intense than ever before; a struggle in which mankind's future is at stake.

On the other side, the President of the association which controls the American film industry is preparing a complete revision of the moral code set up by the industry in 1930. This code is said today to be out of date,

and he wishes to secure the acceptance and distribution of *Who's Afraid of Virginia Woolf?*, the last brain child of the same great Hollywood film company which is interested in joint production with the USSR.

Obscenity in the dialogue and the action, coarseness and cruelty in the characters who never stop quarrelling and insulting each other under the influence of alcohol, make this a film which has just shattered the traditional scale of values of the censorship bodies in America. This film, however, is the one which has the best chance of winning the Oscars this year. In the official circles of the American film industry, you hear the remark, 'This must be the trial balloon which will show us how far you can go.'

An admission of weakness on the one side, and a redoubled ideological offensive on the other—is that all that this exchange will be?

Here comes in the challenge of 1967 to the film industry. Could it not show the modern world the way of a new and needed dimension in the affairs of men?

**The Dictator's Slippers*, the film

which has just been made in Switzerland, marks a step in this direction.

After presenting two stage plays in the setting of the Caux Theatre Fort-night last September, Westminster Productions decided that the best possible place for making a film of *The Dictator's Slippers* was the Caux Theatre, with its excellent equipment. For this purpose it was transformed into a film studio.

This operation, which is without precedent, took place 3,000 feet up in the majestic setting of the heights which overlook Lac Leman. A technician of the team which came specially from London, declared, 'Here at Caux you find the atmosphere in which you can make films with the power to change the course of history.'

Mr Louis Fleming, the Director, outlined to us the aims pursued by his company. Westminster Productions wants to practise a policy of realism. Not, however, the realism which in some theatres is served up in the shape of brutality, depravity, cruelty, perversion, hate and violence.

There certainly must be realism in presenting the condition of men, but it must be a realism which seeks to develop character; a dramatic art with power to light the roads which can lead to hope, peace and unity, towards the solving of mankind's problems; an art which aims at the modernising of man—neither nihilistic, atheistic nor cynical, but seeking to restore to men their dignity.

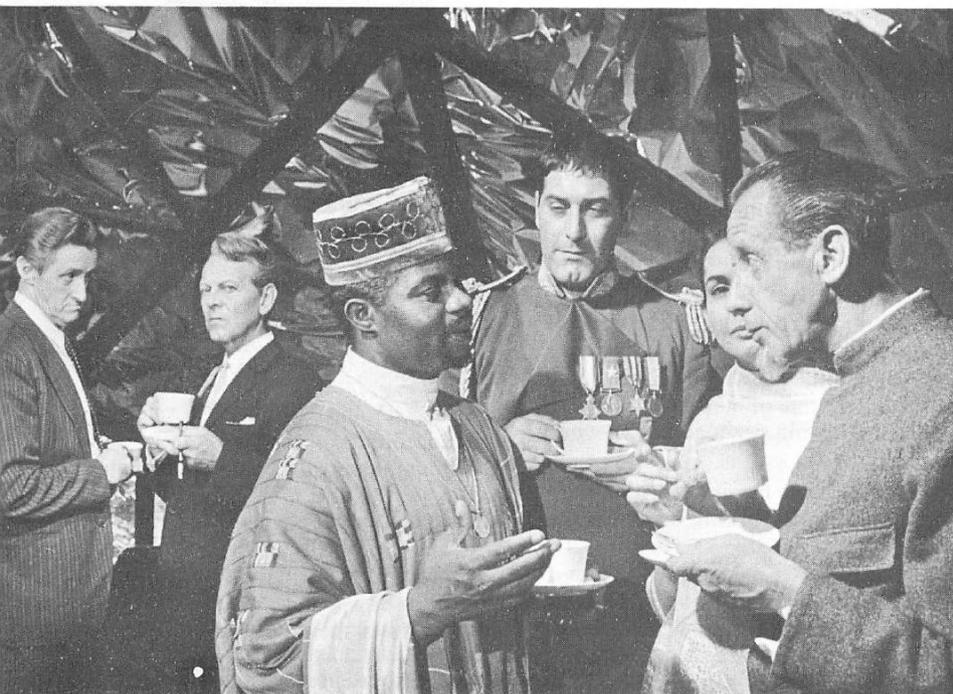
* *The film of Peter Howard's play.*

MRA PRODUCTIONS announce that their 16mm films including *The Dictator's Slippers*, are now available for hire through:

SOUND-SERVICES LTD,
Kingston Road, Merton Park, SW19

A new catalogue will shortly be available. Please write to:

MRA Productions, Four Hays Mews,
Berkeley Square, London, W1



A scene from the film 'The Dictator's Slippers'.

photo Maillefer

They came by canoe

THEY PERCHED in the trees. They covered the hillside of the natural amphitheatre. Even the light stanchions had people hanging from them. 'This is fantastic', said a local journalist as he surveyed the 4,000 people who saw *Wake Up Matilda* at Port Moresby's Ela Beach Oval.

The show was given with a simultaneous translation into Motu.

The crowd reaction varied from gales of laughter that almost drowned the dialogue of a family scene from a true story of a Melbourne watersider to rapt attention as the show built towards its climax when the crowd rose to its feet for the Motu song 'Papua'.

Two nights earlier at the rugby league ground 2,000 had seen the show with a Pidgin translation. Audiences make up one-fifth of the indigenous population of Port Moresby. They came from every part of the territory—some from oil drilling rigs near the West Irian border, others came in their canoes from up the coast.

With the cast on stage were some who had seen the show earlier in the week and 35 schoolchildren from Hanuabada, a village built on stilts over the sea. The Department of Information made available their best Pidgin and Motu translators and the staff from the ABC radio station translated the main choruses for the cast to learn.

Donald Barrett, Member of the House of Assembly from Rabaul District, and Michael Somare, one of four rotating presidents of the new political party 'Pangu Pati', formed this week on a 'Home Rule' platform and Miss Helen Sikot, official Pidgin translator in the House of Assembly, did the spoken Pidgin translation.

The local boxing association gave their boxing ring platforms for the stage. A well-known police band played as the crowd streamed into the Oval.

Earlier in the week the Administrator of the Territory, David Hay, came to address the cast. He spoke of the need to create unity for the development of the territory. 'One way is to



Sir Kenneth Parkinson, chairman of Yorkshire Post Newspapers; John Vickers; Rajmohan Gandhi; and J. G. S. Linacre, managing director of Yorkshire Post Newspapers. Gandhi was a guest at lunch with executives of the newspaper photo Yorkshire Post

From the 'Yorkshire Post' 12 June

H Bomb Balance of terror Warning

have something to fight against, namely a colonial power or somebody next door. These ready-made devices are not quite so handy here between Australia and the Territory because the Australian view is that it's up to the Territory to determine its own future. We are not going to stand in the way of it.

'Why cannot a country like Papua-New Guinea find something to fight for rather than against in order to create this spirit of unity which is essential if the country is to develop? That is where you people can come in and help provide something to fight for.

'I mention economic development as part of the aim; I would like to feel something difficult like this could be made a kind of national objective and people could get together to work for it.

'Your mission fits in with this very happily. We are working on much the same track.'

The cast gave a performance of *Wake Up Matilda* at the new University of Papua-New Guinea.

IT WAS unrealistic to think that man could make the hydrogen bomb and continue with lust, fear, hate and greed, and yet achieve such a balance of terror to prevent the explosion of such bombs.

This was said by Mr Rajmohan Gandhi, a grandson of the late Mahatma Gandhi, in Sheffield yesterday during the weekend of the musical *India Arise*, which is on tour with Moral Re-Armament.

Mr Gandhi was referring to China's explosion of an hydrogen bomb the previous day and he said there was a chance it could be used. Yet there was a more powerful force than the hydrogen bomb and this could ensure that the bomb would not be used.

The way out for mankind was the revolution of MRA, which could solve the dilemma facing the Communist and non-Communist countries. The Americans should answer Communism with MRA.

* * *

The Star, Sheffield, in reviewing *India Arise* wrote: 'Theatrically, the musical is brilliantly arranged, presented at a superb pace, and is unlimited in vivacity and colour.

'Although many of the cast left their jobs to join in this great adventure of belief, the overall message of simple faith and goodwill they are successfully managing to provide via the medium of a polished theatrical venture surely justifies their decision.'