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27th to 31st August 1987

AIDS sums "too much"

A RETIRED bishop yesterday criticised the "vast sums" of British Health Service money being spent on drugs for AIDS.

The Rt. Rev. Hugh Montefiore, former Bishop of Birmingham, was speaking at the annual conference of the British Association for the Advancement of Science at Queen's University.

"If an illness is always terminal, if drugs exist which may delay death but which have bad side effects, there is little point in spending vast sums on those to the detriment of many waiting for routine treatments," he told the conference.

During the debate, the former bishop also backed calls for the issue of free, clean needles to drug users.

"Providing the needles are made available on a new for old basis I can see no objection. Such practice does not encourage fresh people to begin drug abuse, or existing drug users to spread the habit. It simply helps to prevent infection among those already addicted," he said.

The clergyman said that special emergency measures might be considered if the AIDS virus ever caused deaths on the scale of the Black Death.

"I could imagine, for example, in a very extreme situation, with the population worse than decimated, public opinion might be so inflamed as to make prostitution illegal and, as in some Muslim countries, adultery and fornication both a crime.

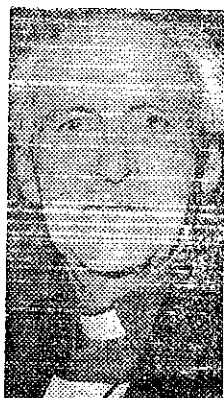
"But this would run clean contrary to our established customs and in any case such a situation is extremely improbable," he said.

The Rev. Montefiore said it was wrong to consider AIDS as a personal judgment sent upon an individual for his wickedness.

"A person with AIDS should continue to work as long as possible and his care should be undertaken at home whenever possible," he said.

Top churchman admits recoiling from a sufferer

Don't waste cash on the victims of AIDS says bishop



Bishop: Fortwright

THERE is little point in spending vast sums of Health Service money on AIDS drugs, a bishop said yesterday.

The Rt. Rev. Hugh Montefiore said: 'If an illness is always terminal, if drugs exist which may delay death but which have bad side effects, there is little point in spending vast sums to the detriment of many waiting for routine treatment.

'I can't believe it is right for a

By JOHN ILLMAN
Medical Correspondent

patient to wait three or four years for a hip replacement operation so that people can have drugs that have devastating side effects.'

The controversial address by the recently retired Bishop of Birmingham highlights the growing ethical dilemma facing doctors fighting for funds for many thousands of patients waiting for non-urgent operations.

Professor Michael Adler of the Middlesex Hospital, one of Britain's major AIDS treatment centres, said last night that it would be unethical to deprive victims of new life-prolonging drugs.

But the Bishop told the British

Association for the Advancement of Science in Belfast that some experts believed there would never be either a cure or a vaccine against AIDS.

He questioned the use of a new drug called AZT which does not cure the disease but which has been shown to hold it at bay — at a cost of about £5,000 a year.

In his forthright Belfast speech the bishop said he believed drug addicts should be issued with free needles to safeguard them from the disease.

Emotions

And he urged greater love and compassion for the thousands of people in Britain living in fear of AIDS. But he admitted that he himself had recoiled from an infected victim.

He told of the difficulty he had experienced about shaking hands with the man after they had appeared together on television. 'I had to go and make myself shake his hand,' he said. All my emotions were against it. All my head was in favour of it. I am happy to say that in the end my head won.

'I think that it was an emotional reaction to a disease for which there is no cure which makes one revolt against what one knows is a logical thing to do.'

However, he was not arguing that victims should not be treated at all, and he did not believe that AIDS was a judgment for personal wickedness.

The same conference was told that within 50 years tooth decay could be prevented by a vaccine or a quick swish every day with a biological mouthwash.

Britain's youngest professor, 31-year-old Mark Ferguson of the University of Manchester, said dental researchers had identified the bacteria which rot teeth and they were discovering antibodies to kill them. The revolution taking place in dentistry could have enormous spin-offs for general medicine, he added.

EVENING PRESS, THURSDAY, AUGUST 27, 1987

AIDS — the pay plague

AS THE epidemic strides out over America leaving death, suffering and fear in its wake, major corporations and small-time entrepreneurs alike are discovering that there's serious money to be made from AIDS.

A growing range of AIDS products from leather condom holders and antiseptic phone-wipes to "miracle" drugs, vaccines and diagnostic tests could bring in billions of dollars in revenue for their manufacturers by the middle of the next decade.

The atmosphere of fear and desperation, of course, provides fertile ground for fraud. According to a recent congressional estimate, \$1 billion will be spent on bogus AIDS therapies this year alone.

In New York, patients can buy \$20 bottles of pond scum, \$100 injections of a byproduct of their own urine, \$500 herbal treatments. Anything that offers hope will sell. Even the rumour of a new

AIDS drug can send a company's stocks soaring on Wall Street.

And then there are the "legitimate" products like condoms, which despite recent FDA tests that have shown a failure rate of one in 50 are expected to bring in \$450 million this year and \$1.3 billion by 1991. The fact that there is little or no clinical evidence that condoms can prevent the spread of AIDS will not hinder their being promoted heavily as the next best thing to abstinence.

Although Wall Street has responded well to the performance of AIDS-related companies, stock analysts are still advising the average investor to stay away from businesses dependent on the behaviour of a virus that no one, not even scientists, fully understands.

But how long, one wonders, before the whole economy shifts onto an AIDS footing, and fortunes can be made selling those cheerful buttons that declare: Make War Not Love — It's Safer?

Irish Independent
27th August 1987

Bishop queries spending on AIDS

VAST sums of health service money should not be spent on drugs for AIDS sufferers, the British Association for the Advancement of Science in Belfast was told yesterday.

The retired Bishop of Birmingham Rt. Rev. Hugh Montefiore said that, if an illness was always terminal, and if drugs existed which might delay death but created bad side-effects, there was little point in spending resources to the detriment of many waiting for routine treatments.

There were moral and social questions about how much public money should be spent on drugs for AIDS sufferers, he added.

Dr. Montefiore said the danger of spreading the disease would vanish overnight if every person were faithful to one partner: where this ideal was unattainable, the use of condoms should be encouraged but not in such a way as to promote promiscuity.

He also backed calls for the issue of free clean needles to drug users, providing they were made available on a new-for-old basis.

"Such practice does not encourage fresh people to begin drug abuse or existing drug users to spread the habit. It simply helps to prevent infection among those already addicted."

There were arguments against compulsory screening of the population for AIDS. In itself this was not unethical but if it drove antibody-positive people underground, it would be self-defeating.

However, there should be increased facilities for speedy volunteer testing and normal blood tests should include one for the HIV (AIDS) virus, he said.

He was in favour of a sufferer continuing to work as long as possible. The care of AIDS victims should whenever possible be undertaken at home.

These social problems needed to be treated with consideration, sympathy and understanding.

THE IRISH TIMES, Thursday, August 27, 1987

Medical officer defends Government AIDS campaign

From Dick Grogan

THE DEPUTY Chief Medical Officer of the Department of Health, Dr James Walsh, defended the Government's publicity campaign on AIDS at a scientific seminar in Belfast yesterday and he claimed that condoms had been "pushed" in the campaign.

But Dr Walsh added that neither condoms nor testing for the AIDS antibodies were the answer to the threat. "Lifestyle is the answer," he said.

Speaking at a British Association debate on the AIDS problem, he said: "We have run a very explicit health education programme in the Republic, in which condoms were pushed. I think the

time has come to focus in on the various high-risk groups."

The intravenous drug abuser, he said, was the bridge along which the virus was passed from the homosexual to heterosexuals. "Our main programme should be aimed at the intravenous drug users. But the routine methods of health education are unlikely to be effective in this, and 'out-reach' programmes must be organised in the inner cities."

A leading British expert on AIDS, Dr David Hawkins, of St Stephen's Hospital, London, said that the 56,230 cases of AIDS reported worldwide to WHO were grossly underestimated. Of the 935 cases officially confirmed in England, 86 per cent were homosexuals.

He felt that more information was needed on the extent of prevalence of antibodies in the blood of the population generally and especially in sections of the population not now regarded as high risk.

He believed that anonymous testing for the antibodies was ethical and felt that there should be pilot schemes of voluntary, anonymous testing of people outside high risk groups.

In reply to a question, Dr Walsh confirmed that a test for exposure to the AIDS virus is now routinely offered to any person who enters prison in the Republic. "If they want to have it, they have it, and it is totally confidential," he said.

Irish Times
27th August 1987

Noctech to manufacture new speedier AIDS-test

NOCTECH, the Irish diagnostics company, has signed an agreement with a Belgian firm for the worldwide manufacture of a new test for AIDS.

Noctech, which employs 40 people in Dublin and Galway, will manufacture the antigen test for Immogenetics, a Belgian bio-technology company which specialises in health care applications.

The test will identify more quickly than existing methods the HIV antibody which is produced in response to the AIDS virus. It can thus be used for early diagnosis of AIDS infection and for testing blood supplies.

The announcement came as part of a new international marketing campaign by Noctech. A new product, developed by the company in association with UCD, is said to be the first commercially available test for the hepatitis delta virus (HDV). It was developed after an outbreak of the virus among Dublin drug users.

Noctech has worked with Irish universities to develop methods of manufacturing easy-to-use diagnostic products at low cost, for both human and veterinary use, and recently put together a £2m. financing deal with venture capital group DCC.

The new products include one called "Checkmate," a pregnancy test for lactating cattle.

Latest 'in' gift is an AIDS test

SHOPS have begun selling a greeting card with a serious message: a gift certificate for an AIDS test . . .

"I've never heard of anything like this before," Ann Downer, health educator for the Seattle-King county department of public health AIDS project said yesterday.

Lisa McCane, bookkeeper for the sexually-transmitted disease clinic of the Harvard Denny Medical Building which is marketing the cards — also said the idea may be a first.

The price of the cards, with the words 'Peace of mind, AIDS,' is 30 dollars — a good price, says Ms.

Downer, for a private blood test or exposure to acquired immune deficiency syndrome. Some private clinics charge 150 dollars, she pointed out.

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Aids cases increasing among heterosexuals

UNPUBLISHED figures suggesting a rapid spread of Aids into the heterosexual population were revealed at a debate on the disease.

Dr David Hawkins, a consultant at St Stephen's Hospital in London, said between 1982 and 1984 his hospital had dealt with no heterosexual Aids victims. In 1985, there was one, in 1986 there were 11, and in the first six months of 1987 there were 10.

Nearly all of them had had sex with high-risk partners, and there were an equal number of men and women.

■ Britain could have a higher risk of child sex abuse than other countries because sex education here has lagged behind, Nicholas Tucker, a lecturer in child psychology at Sussex University, said.

"While jokes in past lore and literature used to echo children's abiding and quite natural curiosity about their bodily functions and sexuality, children's literature today is almost mute on both topics," he said.

"This is not a healthy situation either for children or adults at a time of increasing public anxiety about the possibilities of widespread unreported sexual abuse."

■ The reduction of salt and preservatives in food could lead to an increase in cases of poisoning, Dr Paul Gibbs, of the Food Research Association, warned.

"If you reduce the levels of preservatives, you have got to be aware that the food is no longer what you would expect it to be.

You have changed it from a food which would preserve to a food which is no longer preserved.

"If the salt level is reduced too much, then it could tip us right over the brink," he said.

■ Old people may be going senile because the food they ate as children was contaminated with lead, Frank Shenton, a former public analyst for Durham County Council, said.

He said compounds of toxic metals used to be added to food as colouring agents, and these could be harmlessly "locked up" in people's bones until they reached old age.

The lead would then enter the bloodstream, leading to a gradual falling off in health. Since this was expected, it was not recognised for what it was.

■ Drugs could block some of the effects of radiation on both animals and humans, should a Chernobyl-style nuclear leak happen again, Professor Cecil McMurray, of Queen's University, Belfast, said.

"Our experimental programme has demonstrated that it is feasible to reduce the concentration of caesium in livestock products by either feeding bentonite, a clay mineral, or Prussian blue, an insoluble iron complex," he said.

But he pointed out that the treatments were only effective in blocking the effects of radiation and would be ineffective in healing either animal or human after exposure to radiation.

The quest for an AIDS vaccine

It may be two years or ten before researchers find the means to treat or prevent AIDS. One of the most promising approaches to both therapy and a vaccine relies on the strategy of making antibodies against antibodies

Sharon Kingman



THE ONLY hope for people already infected with the human immunodeficiency virus (HIV) is that some new treatment will prevent the virus from causing its lethal damage to the immune system.

Even then, thousands will continue to die in those countries that cannot afford to buy expensive drugs from the West.

Public health campaigns to educate people about "safe sex" are essential, but they are not the final answer. They can have only a limited impact in parts of the world where many adults cannot read.

The only long-term solution to the problem of AIDS will be a vaccine. With this in mind, hundreds of researchers around the world are racing to find a means of provoking the human immune system into making antibodies that will protect against infection with HIV. One possible vaccine went on trial in the US last week (see p 16).

In Britain, the government has provided the Medical Research Council (MRC) with £14.5 million for a directed programme of research into AIDS (*New Scientist*, 5 March, p 22). The council has now allocated a generous slice of those funds to almost 40 projects.

Together with research into AIDS already supported by the council, Britain now has groups of scientists working on many different aspects of HIV infection, its prevention and cure. At least two of the MRC's grants have gone to teams working on what some leading scientists believe is the best prospect for a vaccine: "anti-idiotypic antibodies". These antibodies could also prove useful as a therapy in AIDS.

Anti-idiotypes explained

An anti-idiotypic antibody is, in essence, an antibody to an antibody. The human body produces antibodies in response to foreign molecules (antigens), such as those appearing on the surface of a bacterium or virus, or on cells in an organ transplant. Antibodies are protein molecules that recognise the shape of a particular antigen. Each antibody has a region that is like a plaster cast of a particular antigen. This variable part of the antibody is the "idiotypic". It binds to the part of the antigen called the epitope. A foreign protein has many epitopes all over its surface.

Antibodies themselves can act as antigens. Imagine taking antibodies from one animal and injecting them into a second animal. The second animal will recognise the antibodies as foreign. It will produce its own antibodies against them. These anti-

bodies are called anti-idiotypic antibodies, because they recognise the idiotypic of the first antibodies. The intriguing result is an antibody shaped like the original epitope.

In HIV infection, the virus mainly attacks a type of white blood cell called a T-helper cell. Proteins on the envelope of HIV bind to a molecule, the CD4 receptor, which is also a protein, on the surface of the T-helper cell. Both proteins are glycoproteins: they have sugar molecules attached to them.

HIV presents scientists with two peculiarly difficult problems when it comes to designing a vaccine. First, the virus mutates many times faster than, say, the influenza virus. Researchers have managed to stimulate laboratory animals to produce antibodies effective against one isolate, or strain, of the virus. But these antibodies do not neutralise all strains of HIV.

The second problem is that the antibodies that a person infected with HIV produces do not neutralise the virus effectively. Normally, someone produces antibodies that fight an infection; when the person recovers, the antibodies provide immunity against a second attack of the disease. But not in HIV infection.

The hope is that anti-idiotypic antibodies may provide a means of circumventing both these difficulties. It seems that anti-idiotypic antibodies may be able to induce an effective immune response against all strains of HIV. Initial work, such as that by Quentin Sattentau, Peter Beverley, Jonathan Weber and Robin Weiss from London's University College Hospital Medical School and the Chester Beatty Laboratories of the Institute for Cancer Research in London, has been encouraging. They injected mice with antibodies against the CD4 receptor on the T-helper cell. The mice produced anti-idiotypic antibodies in response.

This team, as well as Angus Dalgleish and Marek Malkovsky at Northwick Park Hospital in Harrow, Middlesex, and Ronald Kennedy of the Southwest Foundation for Biomedical Research in San Antonio, Texas, has shown that anti-idiotypic antibodies produced in this way can neutralise several different isolates of HIV, presumably by blocking the binding site on the envelope glycoprotein.

In particular, the group in London has shown that anti-idiotypes of this kind can neutralise not only many isolates of HIV-1 but also the second AIDS virus, HIV-2; and the closely related viruses that attack monkeys—simian immunodeficiency virus (SIV). Recent publications giving details of the genetic sequences of HIV-1, HIV-2 and SIV have shown that only a few sequences of amino acids on the envelope glycoprotein are common to all three types of virus. One or a cluster of these so-called "conserved" regions will form the binding

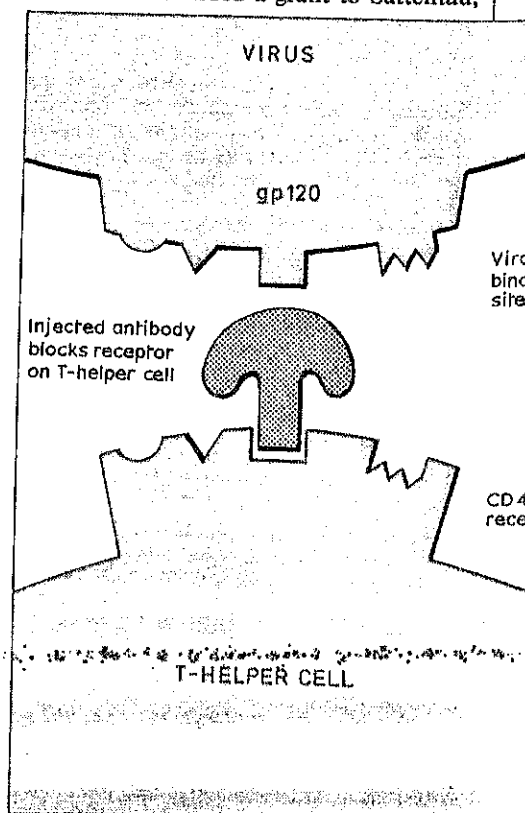
site. The results from Sattentau's team also suggest that the binding site on all three viruses is highly conserved.

For the virus, it makes sense to preserve the structure of the binding site. If the binding site were to mutate, it would no longer recognise the CD4 receptor on the T-helper cell, and could not attack its host.

This is also good news for those on the track of a vaccine. It means that researchers may be able to identify a molecule that blocks the binding site on every isolate of the virus. It may be possible to find such a blocking agent even though the immune system itself does not produce antibodies to block the binding site in this way—perhaps because this part of the glycoprotein is normally hidden.

So far, these studies of the binding site have been rather preliminary. Serum extracted from mice that have been induced to produce anti-idiotypic antibodies contains many other antibodies too. Researchers cannot be absolutely certain that they are observing a specific reaction between antibody and binding site. In any case, it is difficult to obtain large quantities of mouse serum.

Money from the MRC should allow scientists to solve these problems. The council has awarded a grant to Sattentau,



The therapy: antibodies against sites on the receptor of the T-helper cell may prevent the virus from binding

together with Michael Adler of the Middlesex Hospital Medical School, to develop purer antibodies for more precise studies of the viral binding site. Knowledge of the structure of the binding site is also important in another strategy for a vaccine. Researchers may be able to design a peptide—a short chain of amino acids—that would block the binding site.

Sattentau will start off with a collection of monoclonal antibodies sent to him by researchers around the world. These are "clones" of genetically identical cells that produce a single antibody which it is possible to purify. In this case, each clone of cells may produce antibodies against a different epitope on CD4.

By injecting these monoclonal antibodies into mice, one clone at a time, and identifying cells that produce anti-idiotype antibodies against the first antibody, the researchers should be able to produce monoclonal anti-idiotypes. Each of these, remember, will probably resemble an individual epitope on CD4. Once they have produced such monoclonal anti-idiotypes, Sattentau will be able to begin mapping the binding site of the virus.

Fragments of protein

In HIV, a gene called *env* provides the genetic information for the envelope glycoprotein, called gp120. It is this protein that carries the binding site which recognises the CD4 receptor on the T-helper cell. The next part of the project will be to take fragments of the *env* gene and grow them in a "vaccinia expression system".

Vaccinia is the virus that induces immunity to smallpox. If you insert a gene into vaccinia, the virus will manufacture the protein that the gene codes for. Infect a cell

with such a genetically engineered virus, and the cell expresses (shows) that protein on its surface.

Some researchers are using this technique to try to induce neutralising antibodies to the whole protein gp120. Adler and Sattentau, however, are going to use vaccinia containing only fragments of *env*. They will then have a whole range of cells, each presenting a different segment of gp120. By adding monoclonal anti-idiotypes to these cells, they hope to find out which portions of the envelope glycoprotein these antibodies recognise.

Sattentau says that they have so far made about 12 monoclonal anti-idiotypes. One or two "do seem to have some sort of activity against the virus". In other words, a couple of them must resemble epitopes of CD4 sufficiently to bind to the virus.

Success in Texas

Ronald Kennedy and his colleagues in Texas have already made one monoclonal anti-idiotype which, they found, partially neutralised HIV infection of human T cells in the laboratory (*Proceedings of the National Academy of Science USA*, vol 84, p 3891). They produced this anti-idiotype by injecting mice with monoclonal antibodies against an epitope on CD4 called Leu-3a.

Kennedy and his colleagues say that a monoclonal anti-idiotype recognises only a single epitope on the viral envelope and may not efficiently prevent binding. A pool of several monoclonal anti-idiotypes that recognise several sites may be more efficient in inhibiting binding, they believe.

In Britain, Dagleish and his co-workers at Northwick Park Hospital are pressing ahead with developing a treatment based on the anti-idiotype antibodies produced in the sera of mice. These researchers are the second group to receive funds from the MRC for work on anti-idiotypes.

They now have permission to inject a mouse antibody which recognises the epitope called Leu-3a into people. (According to convention, this antibody should be called anti-Leu-3a. However, many researchers name the antibodies according to which epitopes they recognise, as in this case.) This trial is to determine whether Leu-3a, by blocking part of the CD4 receptor, can prevent viral replication in the body. Dagleish will test the treatment on two patients, both with AIDS-related complex, a condition that often precedes AIDS.

Starting within the next few days, both patients will receive injections of the antibody for a week to ten days, just long enough to see whether the virus in their blood clears. Dagleish says: "We know that Leu-3a is one of the most effective antibodies or compounds known in its ability to inhibit infection in the laboratory. It demands to see whether this also applies in the clinical situation."

What effect might there be on the patient's immune system if you block the binding site on CD4? If the binding site is blocked, HIV would not be able to bind to the cell—but neither would other antigens that normally allow the T-helper cell to respond to infections. The patient could become even more immunosuppressed.

Dagleish says: "Obviously we'll be look-

ing at that. But some people think that immunosuppression is not a bad thing." A high degree of activation might cause more T-helper cells to divide, in turn setting off viral replication. In addition, healthy, noninfected people have had injections of Leu-3a with no bad side effects.

Might the two patients make their own anti-idiotype antibodies against the mouse antibodies? No, says Dagleish. The body needs to have the preparation "flagged" as foreign with an "adjuvant" before it will respond well. An adjuvant is a preparation which enhances the immune response to any antigen injected with it. One of the most common adjuvants is an emulsion of oil and water containing killed bacteria, called Freund's. Unfortunately, Freund's cannot be used in humans.

Dagleish says, however, that Kennedy in Texas has developed an adjuvant which will present the immune system with antibodies in an appropriate way. Kennedy has already used anti-idiotype antibodies to vaccinate chimpanzees against hepatitis B, with good results. Dagleish and Kennedy may collaborate in future to see if Leu-3a, coupled with a suitable adjuvant, can induce the production of anti-idiotypes. Animal tests would have to take place initially.

Some reservations

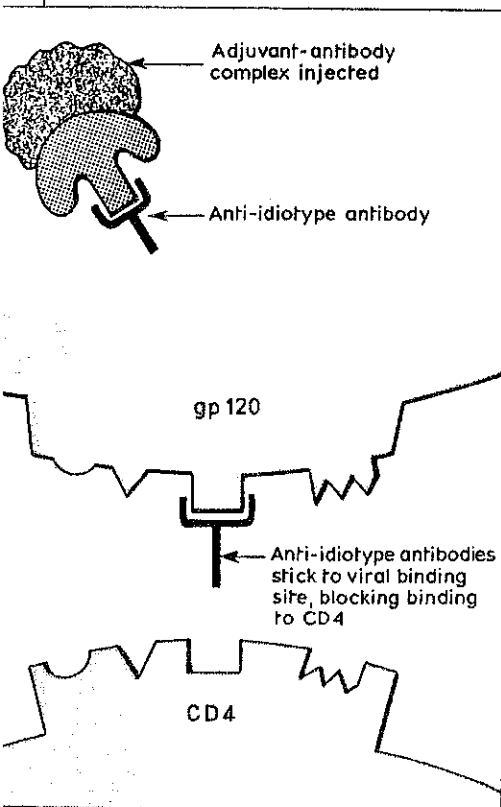
There is one apparent anomaly in these approaches. The body produces a multitude of antibodies against HIV, none of which appear to conquer the infection or provide immunity. Why should antibodies produced in the laboratory be any different? Luc Montagnier of the Pasteur Institute in Paris has speculated on the reasons why the viral site that binds to CD4 produces such a poor immune response (*Nature*, vol 326, p 662).

He suggests three possible causes. First, the binding site might be masked by sugar molecules. Secondly, it might otherwise be poorly exposed on the surface of the virus. Thirdly, it might mimic antigens already present in the body. The body recognises these as "self", so the immune system does not respond to them.

Sattentau says that there are indications that the third possibility may be true. He has studied uninfected cells using a method called immunofluorescent staining. Anti-idiotypes, he says, appeared to recognise some uninfected cells.

Possibly, antigens on certain cells of the immune system—class 2 major histocompatibility antigens—may be involved. If both the virus and HLA class 2 antigens bind to CD4, they may have a shared epitope, so that HIV mimics a self antigen. It may be, however, that HIV binds to different epitopes of CD4 than those to which HLA class 2 antigens bind. If so, the immune system may be able to cope with both the blocking of virus binding and the production of anti-idiotypes.

If the epitope is shared—and there is no firm evidence yet that it is—HIV infection will provide scientists with an even tougher problem than they first imagined. To date, however, the anti-idiotype approach is the only one which generates neutralising antibodies against a whole range of HIV strains, including HIV-2. In this respect, it is currently the most promising. □



The vaccine: such antibodies, "flagged" as foreign, may induce production of other antibodies that bind to the virus itself

Human trials of AIDS vaccine leapfrog animal tests

TRIALS on human volunteers of a potential vaccine against AIDS will begin in the US in October. MicroGeneSys, the company that makes the vaccine, has already tested it on laboratory animals. But researchers have not yet checked the effectiveness of the vaccine in these animals by trying to infect them with the human immunodeficiency virus (HIV).

News of the trial broke in the same week that other American researchers reported that their attempt to protect chimpanzees from HIV infection by vaccinating them had failed (*Nature*, vol 328, p 721).

The vaccine that MicroGeneSys will test is made of the envelope protein of the virus, called gp160. The company, which is based in West Haven, Connecticut, is manufacturing this protein with the help of recombinant-DNA technology, using a "baculovirus expression vector". The method involves inserting the viral gene that codes for gp160 into a virus called

baculovirus. Once the virus infects insect cells in culture, the cells make gp160.

MicroGeneSys is carrying out the trials in conjunction with doctors at the National Institute of Allergy and Infectious Diseases in Bethesda, Maryland. Two-thirds of the 81 volunteers will receive the vaccine; doctors will give the rest a control preparation.

All but 15 of the volunteers chosen will be homosexual men. All 81 will have tests to establish that they are not already infected with HIV, and all will be educated on how to avoid HIV infection.

Franklin Volvovitz, president and chairman of MicroGeneSys, said that the Food and Drugs Administration did not require the company to attempt to infect vaccinated animals with HIV before beginning trials on humans. "Possibly that challenge would be done prior to subsequent trials."

The current trial is to establish the safety of the vaccine and find out what kind of

immunity and antibodies it induces.

Other researchers have been testing a different type of vaccine against AIDS. Shiu-Lok Hu and colleagues, who work for Oncogen in Seattle, Washington, immunised six chimpanzees with vaccinia virus containing the gene that codes for the viral protein gp160. (Vaccinia is the virus that induces immunity to smallpox.) The chimpanzees' immune systems did respond. But when researchers tested the immunity raised by injecting the animals with HIV, each one succumbed to infection.

Hu and colleagues say, however, that they do not know whether the immune response would be the same in humans as in chimpanzees. The French researcher, Daniel Zagury, reported earlier this year (*Nature*, vol 326, p 249) that immunisation of humans with a similar vaccine to that used by Hu's group resulted in antibodies that could neutralise HIV. □

● The quest for an AIDS vaccine, p 24

NEW SCIENTIST

27/8/87

AIDS fear

stops operation

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A WOMAN who is scared of catching AIDS is refusing to undergo an operation because doctors won't let her donate her own blood in advance.

Mrs. Carole Watson, who is due to have a hysterectomy at Newcastle-upon-Tyne General Hospital on September 7, said doctors maintained that since all blood donations had been tested since 1985, there was now only an extremely remote possibility of contracting AIDS from a transfusion.

But 36-year-old mother of three said her family had already been hit by a million-to-one chance.

"My daughter Karen has an extremely rare type of cancer, and I have spent the past 14 years caring for her, so I am not prepared to take even the remotest risk of anything happening to me, because she needs my continuing help" said Mrs. Watson, of Newcastle.

"I have asked the doctors if they can give me a 100% guarantee that I cannot get AIDS from a blood transfusion, and they have not been able to do so. Despite the testing procedure, mis-

takes can be made in laboratories — no-one is perfect."

Mrs. Watson, who also has a 16-year-old daughter and a son of eight, added: "This is a ridiculous situation, because I could walk into any blood donor unit, give a pint of blood for anyone else, but it could not be used for me."

She said she is regularly asked to take Karen along to take part in lectures, and to be seen by medical students.

"We have helped them a lot of the years, but now they won't help me," she said.

Karen was diagnosed as suffering from Mucosal Neuronal Syndrome, a tumour that attacks the body's glandular system, when she was nine months old, and underwent an operation at Great Ormond Street Hospital, London.

Mrs. Watson said she desperately needed the operation, and hoped some way could be found around the problem.

"If am fighting over this, not just for myself, but for other people due to have planned operations who are worried about blood transfusions."

Dr. Anne Collins, director of the Northern Regional Blood Transfusion Service in Newcastle, said it is understandable people should be concerned about the problem of AIDS, but "If I was in this lady's position I would not hesitate to have the operation because I have complete trust in the donors, and the checks carried out under very stringent Department of Health guidelines."

In this region not a single case of AIDS is known to have arisen from a transfusion since the 1985 checks were introduced, she said.

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AIDS tape is 'still in shops'

THE withdrawal of a controversial tape on AIDS from Veritas shelves was described as "not important" by a member of the Catholic Church's Task Force on the disease yesterday, writes **GENE McKENNA**.

What was important, said Father Paul Lavelle, co-ordinator of the Task Force was that the tape was still available in the Church-run Veritas shops in Dublin, Cork and Sligo.

The tape can still be bought at the bookshops for £3.95 per copy, although the Church authorities removed it from the shelves after one of its participants, Father Bernard Lynch (40) from Co. Clare, became involved in disagreements with his diocesan superiors in New York.

The four-hour long tape, made in Dublin, records a discussion in which Father Lynch, now living in the US, calls for homosexuality to be made legal here.

Veritas takes Aids tape off public display

By GREGG RYAN

A CONTROVERSIAL tape on Aids has been withdrawn from public display by Veritas, the Church's communications publishers, who produced it.

The tape was prepared earlier this year by Clare-born priest Fr. Bernard Lynch with Fr. Paul Lavelle, co-ordinator of the Bishops' Task Force on Aids here.

Veritas, who are still selling the tape to anyone who asks for it at £3.95 a copy, took it from the shelves after it became known that Fr. Lynch was involved in repeated clashes with Cardinal O'Connor of the Archdiocese of New York.

On the "Late Late Show" in April, Fr. Lynch accused the Archdiocese of not doing enough for homosexuals and said the Church's response to the Aids problem was "convoluted".

The tape includes a piece in which Fr. Lynch is heard to advocate pressure on the Irish Government to legalise homosexuality here.

Fr. Lynch's links with "Dignity", the New York organisation for Catholic homosexuals, which has also clashed with the Diocesan authorities on the issue of homosexual practices, led to his resignation from Mount St. Michael's Catholic Boys' Academy in East Bronx.

And another priest, Fr. John Harvey, speaking on RTE Radio, said yesterday that the Diocesan-approved organisation for homosexuals, "Courage", differed from "Dignity" in that it followed the teaching of the Church in holding that homosexual physical practices were always wrong and said that the Church was doing much work among homosexuals in the Diocese, both in counselling and hospitals for Aids sufferers.

The New York diocesan authorities withdrew Fr. Lynch's authority to minister in the US after it learned that the priest had refused to return home on the instructions of the Provincial of the Missionary Order in Cork.

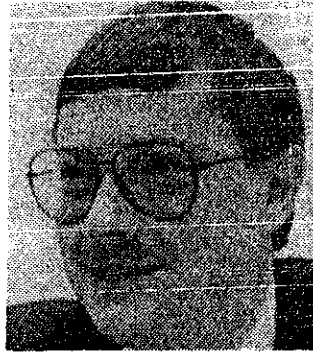
Fr. Lynch is in Ireland at present, but will not comment on the affair, while a spokesman for the Order said discussions are taking place about his future but he is expected to return to New York within a month.

Irish Times
28th August 1987

AIDS changes sexual behaviour

A RECENT survey at an English university had revealed that the AIDS scare had led to considerable changes in the sexual behaviour and attitudes of students, especially among those who might be considered most at risk, the British Association's annual meeting was told yesterday. The survey however, also showed that many students had been sexually active in a way that put them at risk.

Dr Guy Cumberbatch and Dr Lorna Debney of Aston University, Birmingham, said over 250 students had been asked to list their sexual partners in the past year. One quarter of the students had none, 41 per cent had only



Dr Guy Cumberbatch

one, but 33 per cent had more than two. Nearly a quarter had a "one night stand", and in over half of the casual relationships condoms were not used.

Twenty-four per cent said they had changed to "safer sex". Of those who had had multiple sexual partners, 47 per cent said they had changed. Nearly 50 per cent said they were considering future sex "with a regular partner only" while one in five was considering less casual sex.

Combing the Earth for Cures to Cancer, AIDS

The cancer institute is looking for drug candidates in the heart of the rain forest and the belly of the sponge

THE little sea squirt *Trididemnum solidum* leads an obscure but tenacious existence, filtering its nourishment from the sea as it clings to rocks in shallow marine habitats, where a colony of the animals is said to resemble a glistening green crust.

What is remarkable, though, about this species of tunicate is not its color or consistency, but a compound that is extracted from it called didemnin B, a drug which last August entered clinical trials against a litany of human cancers.

A rejuvenated Natural Products Branch of the National Cancer Institute in Bethesda, Maryland, hopes the world holds many more surprises like the sea squirt. To find them, the institute has launched an ambitious \$8-million program to support collectors who will spend the next 5 years combing the planet for possible drug candidates.

What lies ahead is the tremendous diversity of the rain forests and oceans, where the collectors will gather not only plants, but marine invertebrates, microorganisms, blue-green algae, and fungi. A laboratory to screen 10,000 substances a year against 100 cancer cell lines and the AIDS virus is now being organized in Frederick, Maryland.

Using natural products to manufacture drugs is, of course, an ancient and well-established practice that has yielded such familiar products as morphine, digitalis, penicillin, and aspirin. What is new about the cancer institute's latest drug-development program is the vigor and scope of the undertaking. The institute has even contracted with a small company called Sea-Pharm, Inc., of Princeton, New Jersey, to use submarines to collect marine invertebrates from depths reaching 900 meters.

In the past, the natural products branch screened plants obtained primarily from the temperate regions, a relatively barren habitat compared to the tropics. Also, material was often sent in willy-nilly by collectors, some of whom simply labeled their submissions "genus species unknown," which unfortunately made their gestures "barely better than worthless," says Richard Donovan of the natural products office. More problems included materials that were sometimes

dried to such an extent that many of the active compounds were lost. Finally, extracts of plant and animal matter were tested for toxicity against murine leukemia, a screening technique that does much to gauge how well a toxin kills rapidly dividing cells but gives scant information about how effective the compound will be at controlling specific slow-growing tumors.

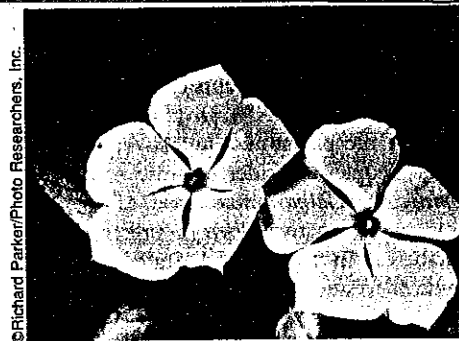
Such problems were in part the reason why the cancer institute's natural products branch went on the skids in the early 1980s. Its recent turnaround can be explained in several ways. Certainly, money devoted to AIDS research is one reason, as is the development of cell lines to test the extracts against specific cancers.

Moreover, a sense of urgency underlies the project, says Gordon Cragg of the natural products office. The rain forests, and the species they nurture, are rapidly disappearing. There is a feeling that if the jungles and reefs are not methodically scoured for drug sources now, it could soon be too late.

In some areas of the tropics, such as the Amazon valley, only 1% of the flora has been tested for any kind of bioactivity, reports Michael Balick of the New York Botanical Garden, one of three institutes under contract with the natural products office to collect and identify flora in the tropics.

Says Balick: "The problem is that rates of extinction are escalating so quickly that if one were to find a plant that displayed interesting bioactivity, it's quite possible to go back and find its habitat destroyed. It is a race against time."

Since it is almost impossible to predict what organisms might harbor substances that are effective in treating cancer, the natural products branch is casting a wide net. Interesting compounds seem as likely to come from the roots of the Mayapple plant as from microorganisms living in the gut of a sponge. Gregory Patterson of the University of Hawaii at Manoa, for instance, found a species of blue-green alga living in a fountain on campus that produced novel compounds that were active against types of leukemia in culture. On contract with the cancer institute, Patterson and colleagues



Anticancer agent. NIH wants to find more drug sources like the rosy periwinkle.

will collect, cultivate, and prepare extracts of 1000 strains of blue-green algae over the next 5 years. Another group at the University of Connecticut at Storrs is doing a similar thing for fungi.

Collecting materials for the cancer institute is no walk in the park. Foreign governments can be suspicious of scientists coming to look for new and perhaps valuable medicines, says Djaja Doel Soejarto of the University of Illinois at Chicago, whose group is responsible for collecting plants in Southeast Asia. "The host country often wants to know, quite simply, 'What do we get out of it?' And I think that is a fair question." So Soejarto tries to involve individual researchers and herbariums from the host country and to explain to government officials that, should a plant prove promising, the country could cultivate it or petition a drug company to set up manufacturing. Says Soejarto: "If the plant is endemic, the country has a monopoly."

Other difficulties arise. The institute needs relatively fresh samples. For marine invertebrates, that means freezing. For plants, that means dry samples, but not too dry. "And this is not so easy to do in the jungle during the rainy season," adds Soejarto. The institute also requires bulk—about a kilogram for each sample of plant and marine material.

If a plant displays anticancer activity, it may take thousands of kilograms of raw material to get a hundred grams of a specific compound. For example, the institute has contracted for 30,000 kilograms of bark from the Pacific yew *Taxus brevifolia* because a compound isolated from the tree, called taxol, is in early clinical trials. According to Cragg, that amount of bark equals about 10,000 trees, or enough to cause an environmental skirmish in the Pacific Northwest where the tree is found.

The reason for all the dead trees is that many of these natural products are not easy to synthesize. Either the yield is too low or the process is not economically feasible to perform on a large scale. For instance, re-

have been trying to synthesize the past 15 years.

Institute also wants collectors to keep field notes. An area of great interest is the plants and animals are used by people. Consider the case of the rosy periwinkle, *Catharanthus roseus*, of Madagascar. Native doctors prescribed for it. In the United States, powerful anticancer agents isolated from the periwinkle—vinorelbine and vincristine—are today

used to treat various forms of leukemia.

Balick of the New York Botanical Garden just returned from the interior of Belize, where he worked with a well-known *curandero*, or healer, who uses herbal remedies to treat illness. As the forests disappear, however, so do sources such as Balick's medicine man. "These people are encyclopedias of local flora, and they're not being replaced," says Balick.

Indeed, the collecting program has point-

ed toward how important taxonomy is, a field of the natural sciences that in recent years has received little funding or attention. Says Mark Plotkin, director of plant conservation at the World Wildlife Fund in Washington: "As long as people think that the genetic engineers can cure everything, the world will think it doesn't need taxonomists anymore. But there is no biological diversity without the taxonomist to tell the stuff apart." ■ **WILLIAM BOOTH**

Designers in Science

Foreign-born scientists and engineers in the United States promise to make an ever larger part of the U.S. work force. According to the latest report from the National Science Foundation,* Eighty-five percent of graduate students with permanent visas indicate plans to stay in the United States, and the proportion of those on temporary visas who intend to stay has risen from less than one-third in 1972 to more than one-half in 1985.

All indications, the growth trends in foreign involvement in U.S. science and engineering show no signs of abating" says NSF. Foreign students comprise more

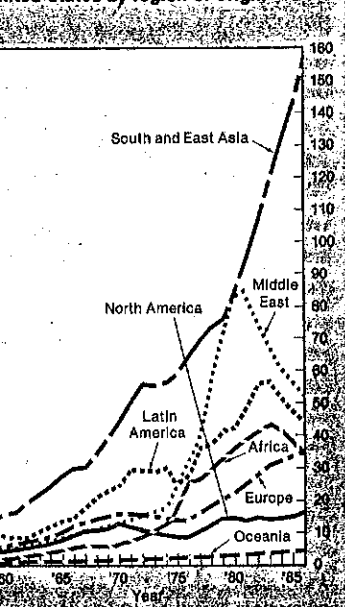
than one-fourth of full-time graduate students in science and engineering, and their enrollment is increasing by 7% a year. At the same time, there has been a proportionate decrease in enrollment by Americans—for example, the number of science doctorates awarded to men dropped from 8.5 to 3.5 per thousand between 1970 and 1985, while the ratio for women rose only from 1.1 to 1.7.

The number of students from South and East Asia has grown precipitously and they now comprise over 40% of all foreign students. The number of Middle Easterners has dropped sharply since 1980, along with declines in world oil prices.

Engineering continues to be the dominant foreign interest, with more than one-half of engineering doctorates going to foreign citizens since 1981. The report says that if the number of foreign students in engineering doctorate programs increases by 2% a year, they will outnumber Americans by 3 to 2 by 1995. Among science fields, computer sciences show the greatest increases in foreign enrollment, averaging 21% a year during 1979–85.

The report says that although the U.S. hosts the largest number of foreign students of any country, it ranks only 15th in the percentage of foreigners in the student population. Among major industrialized nations, the only ones that rank lower are Japan and the Soviet Union. ■ **C.H.**

Chart 2. Foreign students in the United States by region of origin



Hopes and Fears at NSF

The National Science Foundation seems to be doing better in principle than in practice in achieving the doubling of the agency's budget over 5 years approved by President Reagan. Without disclosing any figures, NSF director Erich Bloch told the

Senate that the agency is "not yet ready" to suggest OMB's blessing. At the same meeting, however, Bloch acknowledged difficulties in landing the first installment—funding in the fiscal year 1988 budget now before Congress. With Congress searching for savings in the science budget (*Science*, 3 July, p. 22), he indicated that NSF faces a formidable task in convincing the legislators to fund the full \$1.89 billion requested for the agency. ■ **J.W.**

Comings and Goings

Anthony J. Calio has announced his resignation as administrator of the National Oceanic and Atmospheric Administration. He will take a post as senior vice president for management and operations of the Planning Research Corporation, a provider of computer and other technology-based services for industry and government.

Although the International Institute for Applied Systems Analysis (IIASA) lost the U.S. government contribution to its budget, the East-West research organization has appointed another American, Robert Henry Pry, as director. Pry has held high-level R&D management posts with General Electric and other U.S. companies. He succeeds Thomas H. Lee, who is returning to his professorship at MIT after his 3-year term at IIASA.

Astronomer Sidney C. Wolff has been named director of the National Optical Astronomy Observatories (NOAO) in Tucson. She moves up from the post of director of Kitt Peak National Observatory. NOAO manages Kitt Peak in Arizona and two other major observatories—Cerro Tololo in Chile and the National Solar Observatory, which has telescopes at Sacramento Peak, New Mexico, and Kitt Peak—and oversees a development program that includes work on the National New Technology Telescope



FOR ONE NIGHT ONLY! THE LEGENDARY

RADIATORS

■ THE REUNION gig by the Radiators (from Space) has been switched to Hawkins but will take place as planned on September 13. Guitarist Pete Holidai, who now plays with Light A Big Fire, confirmed that it will be an Aids benefit concert and that there might be a few surprises in store on the night.

Holidai revealed that the old songs (which include "Million Dollar Hero" and

"Kitty Rickets") are all coming back to him and that after a few days rehearsals the band should be hot. The latter day four piece, which included Pogue Phil Chevron, will perform for an hour, following which they'll be joined by original lead singer Steve Rapid to play numbers such as "Television Screen".

The singer with a rather popular Dublin band has also

expressed an interest in joining them for a couple of numbers (clue — Steve Rapid/Averill designs their album sleeves) and has said that if he's not out of the country (clue number two — in America) he'll definitely be there on the night.

The Radiators started off with the punk explosion of the late 'seventies but soon graduated into a formidable songwriting outfit and delivered a classic in the

Tony Visconti produced "Ghostown" album, which was a commercial failure at the time but has now turned into a collector's item. Support in Hawkins will be provided by up and coming Dublin band The Real Wild West and former Virgin Prune Gavin Friday. Above: Radiator's Mark Megary, Jimmy 'Crash' Wynne, Steve Rapid, Phil Chevron, Pete Holidai.

NEWS OF THE WORLD, August 30, 1987

AIDS TEST ON MANIAC RAMBO KILLER



RYAN: Secret gay affairs

**POLICE believe massacre
madman Michael Ryan
was scared he had AIDS.**

And they have called in a Home Office pathologist to do tests on his body to find out if he had the disease. Detectives think the gay Rambo who shot dead 16 people was

By ALEX MARUNCHAK

driven berserk by his terror of the deadly virus.

The Thames Valley force—who are preparing a report on the horrific Hungerford killing spree—have delayed releasing Ryan's body.

Bisexual ex-soldier Andrew Parker, 26, admits having a gay affair with the crazed gunman. He said: "It was clear that I wasn't

the first man he'd slept with."

● **A STORM** broke yesterday over a comic strip depicting a gunman in Rambo-style headband bringing bloodshed to a peaceful English village—just as Ryan did.

Tory MP Michael McNair-Wilson demanded that Oink magazine, published by Robert Maxwell and aimed at teenagers, be withdrawn from sale.

He slammed the cartoon as an insult to grieving relatives of Ryan's victims.

SUNDAY INDEPENDENT, AUGUST 30, 1987

Priest unrepentant on gay views

FR. BERNARD LYNCH, who appeared on the Late Late Show recently, knew when he returned from the United States three months ago that he faced an uncertain future because of his controversial views on homosexuality.

He ran into trouble in the Archdiocese of New York, being banned from saying Mass and hearing confessions by Cardinal O'Connor. Now he is having problems with his own order, the Society of the African Missions.

Fr. Lynch, who has established contact with the homosexual and lesbian community in Dublin, pointed out: "I will have to pay a very high price for what I have done here.

"It is quite possible that I will lose the love of my life—my vocation my formal vocation, for doing because we are in dialogue about

By KEVIN MOORE

this," the 40-year-old Ennis-born priest said regretfully.

However, Fr. Lynch, who belongs to the 400-member Irish Province of the Society of African Missions, has not changed his views about legalising homosexual acts and continues to be trenchant in his criticism of the Church.

He is at present having discussions with Cork-based Very Rev. Con Murphy, head of the order in this country, which has 1,400 priests world-wide. These talks are expected to continue during the week.

Fr. Murphy told The Sunday Independent that the situation was delicate. "I don't want to comment because we are in dialogue about

his future," he explained. "He is not staying at any of our houses."

Fr. Lynch—who was sent to Zambia after being ordained and later went to the U.S., where he spent 12 years—is not revealing his future plans either.

But he said that to come back to Ireland and to find something like the Hirschfeld Gay Community Centre, the National Gay Federation and Reach, an AIDS support group, was "truly coming home."

He is sticking to the view expressed on a tape prepared for the Catholic Social Services Conference—but now withdrawn from sale in Veritas book-shops—that homosexual acts should be legalised here.

Fr. Lynch, who rejects the Genesis 4 condemnation of the Sin of Sodom as crying to heaven for vengeance, said: "It is a cruel world

that places people within such a dialectic."

He declared: "Being gay, being lesbian, is being a spoiled child of God. It is only the spoiled children of God, who get the gift of gayness."

He would tell parents, who had a gay son: "You must be very special parents. God does not give gay children to everybody. What a unique privilege for you."

He was banned from saying Mass and hearing confessions in New York following his support for the American group Dignity, which is made up of homosexual and lesbian members of the Catholic Church.

Fr. Lynch, theological consultant to Dignity, worked with AIDS sufferers in New York. He has been at the deathbeds of some 60 of his gay friends.



Father Bernard Lynch—
"Paying a high price."

Sunday Independent
30th August 1987

SUNDAY INDEPENDENT, AUGUST 30, 1987

Ryan had AIDS theory

THERE has been a dramatic new development in the Hungerford massacre mystery as British police are investigating the possibility that mass killer Michael Ryan may have been carrying the AIDS virus.

The Thames Valley police force have called in a Home Office pathologist to carry out tests on Ryan's body.

If the tests are positive it will back up the hunch of some detectives investigating the murder mystery that Ryan was driven berserk by his terror of AIDS.

According to a story in today's News of the World, Ryan had an affair with an ex-soldier.

No more anti-Aids adverts

By VIVIENNE CLARKE

FROM now on it's up to individual Health Boards to conduct their own AIDS information campaigns as the Government's radio and television advertising campaign is now over.

Voluntary organisations are continuing to provide information, counselling and support in the campaign, but the public perception still remains that AIDS is a 'gay disease' and that heterosexuals are not at risk.

According to Department of Health statistics there have been 21 cases of full-blown AIDS and of this number 13 have died. Among these were homo/bisexuals; five haemophiliacs and three intravenous drug users. Over ten thousand people have been tested for AIDS of which 605 were diagnosed as HIV positive.

The Midland Health Board has been advertising its telephone Helpline on an ongoing basis for quite some time now, but it has no immediate proposals to launch an AIDS

Campaign.

"All our staff are well informed and specially trained on all the information on AIDS, we keep them updated all the time. We also have distribution points in all our buildings where there are leaflets on AIDS" said acting programme manager Community Care, Mr. Michael Bruton.

The Eastern Health Board also has plans to continue its Helpline service, but a spokesman said the Board is trying to manage on a shortfall. However, he said that all efforts will be made to maintain public awareness of the disease.

Donal Sheehan of the Gay Health Action group maintains that there's an awful lot of

public concern about AIDS. Since 1985 Gay Health Action has been working within the Gay community encouraging changes in behaviour.

"Our work is bearing results, but the Government campaign is nonsense. Putting posters up in stations is not going to combat AIDS." The Irish Family Planning Association is also very concerned about the Government's campaign which they consider to be inadequate. Recently the IFPA held an AIDS information week at two of their clinics where they distributed leaflets, showed videos and gave talks on AIDS.

A spokesman for the association said they were surprised at the interest shown. "We received lots of calls too — it's amazing that people still

haven't grasped the basic facts. We noticed that a lot of young people are sexually active, but that there's still a great level of ignorance on all matters sexual. Some still haven't grasped the basics of their own physiology."

Marguerite Woods of the AIDS Action Alliance felt that there was a worldwide complacency about AIDS — "Some people think of it as a Gay disease and are not taking precautions even though this country has a higher percentage of women with AIDS."

"This issue must be kept in the public eye," says the Irish Family Planning Association. "It's too important to be forgotten because of cuts and people must be encouraged to be responsible when it comes to sex."

Aids: doctors puzzled over mental illness

THE MYSTERIOUS mental disability often associated with Aids may occur partly because the disease virus interferes with a chemical that helps nerves function, researchers say.

Studies at the University of Chicago indicate a protein from the surface of the Aids virus keeps an important nerve-growth chemical from reaching brain cells, according to a report published Friday in the journal Science.

The neurons are therefore denied a substance that keeps them healthy and functioning, and this may help explain the dementia suffered by a majority of Aids patients, researchers say.

The progressive neurological problems associated with Acquired Immune Deficiency Syndrome have baffled scientists since they first noticed the disorders about two years ago. No one could explain why the brain is so seriously af-

ected by a disease that primarily attacks the immune system.

About 90 per cent of all Aids patients show varying signs of brain and nervous system complications and specialists estimate two-thirds of those who die from the disease suffer moderate to severe dementia.

Symptoms include psychosis, apathy, difficulty in concentrating, memory and speech problems and impaired body movements.

Dr. Mark Gurney, one of the Chicago Scientists, said the Aids virus blocks a nerve chemical called Neuroleukin, or NLK. This substance also is secreted by white blood cells and plays a role in the body's disease-fighting immune system.

"Neuroleukin also is a lymphokine, or a biological modifier, that we think is important for antibody production," Gurney said in an interview.