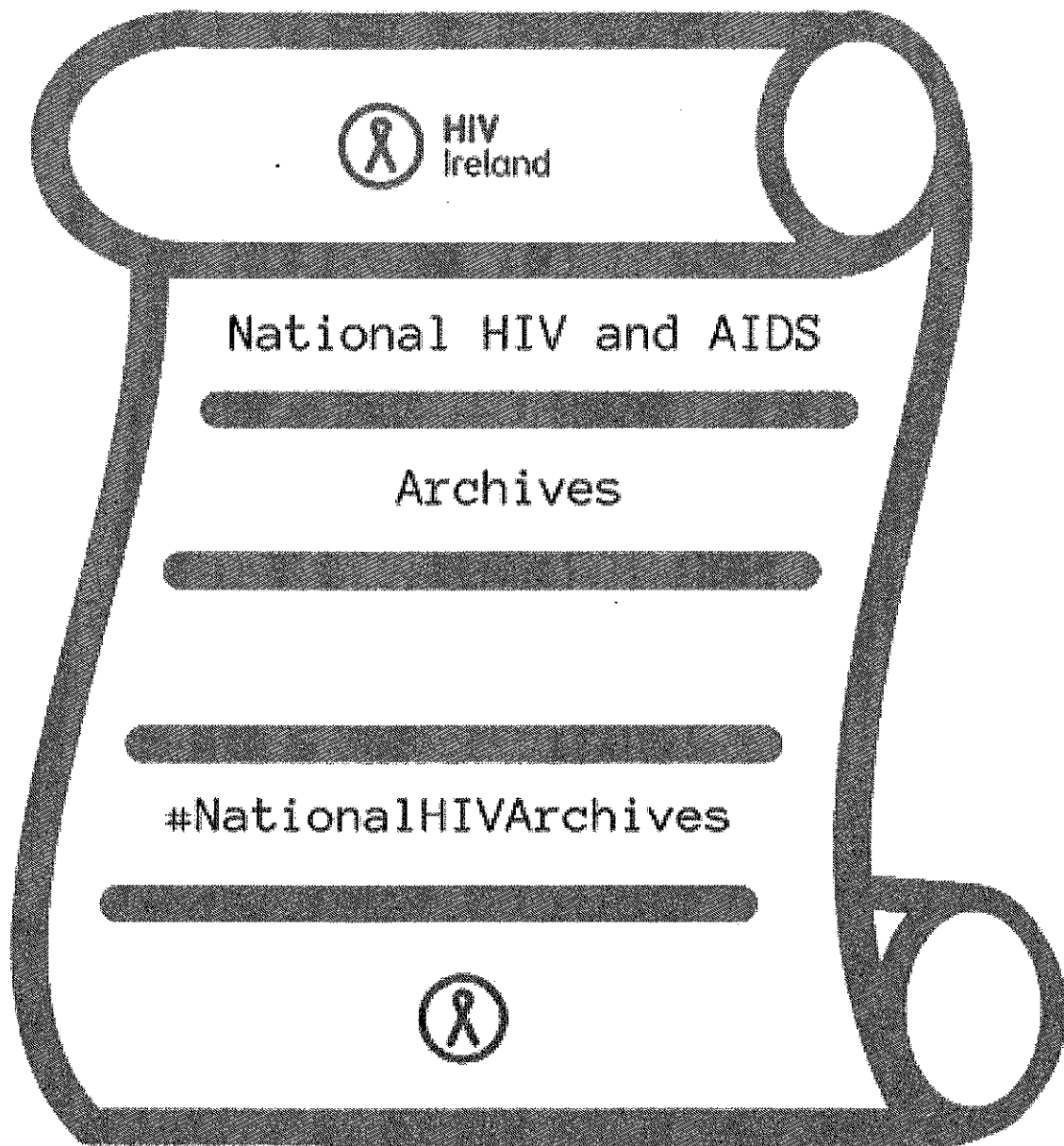


Print Media



25th to 31st March 1987

EVENING PRESS, WEDNESDAY MARCH 25, 1987

New plea by AIDS killer

A man who went into a rage and killed his male sex partner for exposing him to AIDS dropped a defence of justifiable homicide yesterday and pleaded guilty to manslaughter.

Lorenzo Owens, 20, had been on trial for killing Kenneth Grice, 24, last April in Grice's home in Mineola, New York state.

Owens told police that Grice's revelation that he had AIDS, after they had sex, enraged him so much that he lost control and plunged a kitchen knife into Grice's neck. Grice had been discharged from the army after he tested positive for the AIDS virus, police said.

Owens changed his mind, lawyer John Lewis said he learned that his 17-year-old girlfriend was prepared to testify that he had sexual intercourse with her a few hours after the murder without informing her of his exposure to the disease.

Owens has tested negative for the AIDS virus, but doctors say it could still show up at a later date.

Owens could get between two and twenty-five years in prison when he is sentenced on April 21. The case drew wide attention in the US after homosexual rights advocates voiced concern that an acquittal would encourage attacks on homosexuals.

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Evening Press
25th March 1987

Vaccine for AIDS in late 1990s

U.S. Surgeon General Everett Koop warned last night that it was unlikely a vaccine for AIDS would be available before the late 1990s.

"Today it is our hope that we will have a safe and effective AIDS vaccine generally available sometime before the end of the century — say the late 1990s," Koop said. "That's about as optimistic as we reasonably can be."

America's top health administrator was clamping speculation that a cure for AIDS was imminent after a spate of recent publicity about progress in developing a vaccine.

He urged his Press Club audience in Washington to carry his cautious outlook about a vaccine "back to the headline writers."

Koop noted that it had taken 19 years to develop a vaccine for hepatitis B, a comparatively simple strain of virus

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Financial Times Wednesday March 25 1987

AIDS initiative brings switch in UK research policy

IT IS ironic that medical scientists should be the first to announce a directed research programme in Britain. Traditionally they have fought against regimentation.

They campaigned vigorously against the Rothschild report in 1971 which sought more correlation between Government-funded medical research and the country's most costly health problems.

Yet the long-range research programme to combat AIDS is pioneering a type of research management, which scientific advisers want to see more widely used. For the fight against AIDS the Government has found an extra £14.5m to finance the first three years of what promises to be a steadily expanding programme lasting at least a decade.

One conclusion arising from all the agonising over the national bill for science, and the poor correlation with economic objectives, is that Britain needs more directed research. This means programmes with a clear — if faraway — objective, a fund dedicated to that goal, and a will to harness the best of resources.

There is no guarantee that a directed programme will bring success. Scientific research is far too unpredictable.

What directed research can do, if well managed, is to channel resources in whichever direction is showing most promise, or wherever progress is being held up. In the case of AIDS, a worldwide problem, the programme can form part of a co-ordinated international effort.

For AIDS, those resources will range from the ideas of individual scientists such as Prof William Jarrett, a veterinary pathologist at Glasgow

who assembled the first AIDS research team at the US Institutes of Health in 1981. In 1984 his team showed the cause of AIDS was HIV, a retrovirus which is programmed to seek out the T4 lymphocyte, a white blood cell that regulates the body's immune response or barrier against infection. Another such retrovirus is known to cause leukaemia.

The invading virus may lie latent in the white blood cell until activated by a secondary infection. Then, as Dr Gallo wrote in *Scientific American*: "The virus bursts into action, reproducing itself so furiously that the new virus particles, escaping from the cell, riddle the cellular membrane with holes and the lymphocyte dies."

Deprived of such cells, the victim is highly vulnerable to infections, which normally he would hardly notice.

Retroviruses have the ability to cause complex forms of infective disease. HIV not only cripples the body's immune defences, it attacks the central nervous system and increases the risk from several cancers.

The World Health Organisation has called AIDS "a health disaster of pandemic proportions," and wants an international research effort. The US, which has already mounted a massive research programme, is being urged to expand it.

Mr Norman Fowler, UK Health Minister, says he learned on his recent US visit how much US scientists would appreciate participation by their British counterparts, not least for their prowess in immunology, vaccine development and molecular biology. All three can be seen as "enabling technologies" known to be crucial to the basic research that must underpin any successful AIDS research programme.

Sir James Gowans, who heads the Medical Research Council in the UK, plans a two-pronged attack on two distant targets. Each of these two initiatives will be led by its own research director, backed by a small steering committee. The directors will identify the most promising leads and will use their funds to commission specific pieces of work.

Dr Gallo says the search for a vaccine is made more difficult because HIV "comprises a great many variants that form a continuous spectrum of different strains."

Even when proteins are identified, around or within the virus, which will immunise against all or most of the profusion of strains, Sir James says it will take at least five years to learn how to grow the virus in bulk, separate and purify its parts and conduct tests on

BACKROOM by David Fishlock

University, whose funds for vaccine research have been coming from the US, to Wellcome Laboratories at Beckenham, Kent, one of the world's leading industrial centres of vaccine research. It is unlikely to be exclusive to the medical scientists but will involve Government-funded research councils, notably the Agriculture and Food Research Council with its strong base of veterinary science.

The AIDS research programme is the brainchild of Sir James Gowans, the eminent Oxford immunologist who runs the Medical Research Council (MRC). He has persuaded the Government to earmark extra money, rising to £7m a year by 1989, to add to the MRC's £130m research budget. It is a genuine increase in the science budget of the Department of Education and Science, specifically for AIDS research.

The programme has two clear targets: a vaccine to protect against AIDS and a drug to cure those already infected. These are difficult objectives because, as Sir James points out, scientists will be looking for new ways of attacking a virus of "unparalleled complexity." It must first be unravelled into its constituent proteins, only then can drug companies begin to design a vaccine or cure.

The best that companies can do now is to screen existing chemicals to see if they have any therapeutic effect. They have had some success. The most highly publicised discovery so far is Wellcome's azidothymidine (AZT), a 20-year-old anti-cancer drug, originally shelved because of toxicity and its high cost of production.

Last week the British Government announced a product licence for AZT — renamed zidovudine — which Wellcome supplies under the trade name Retrovir.

Far simpler viruses than the human immunodeficiency virus (HIV), with its bewildering propensity for change and for attacking different kinds of human cells, still elude medical science. There are no vaccines yet for malaria, cholera, dysentery or typhoid fever, for instance, all of which have plagued mankind for much longer than AIDS.

AIDS was first recognised as recently as 1981, although it probably first appeared in man in central Africa in the 1950s, according to Dr Robert Gallo,

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Dr Gallo says the search for a vaccine is made more difficult because HIV "comprises a great many variants that form a continuous spectrum of different strains."

Even when proteins are identified, around or within the virus, which will immunise against all or most of the profusion of strains, Sir James says it will take at least five years to learn how to grow the virus in bulk, separate and purify its parts and conduct tests on animals. New animal models must also be found — only the chimpanzee has succumbed to HIV so far.

The quest for an anti-viral drug is expected to be similarly protracted. Anti-virals that are unquestionably less toxic than the virus they attack are scarce at present. To design such a drug requires much greater understanding of the molecular biology of HIV and the structural chemistry of its parts, than anyone has today.

Dr Hiroaki Mitsuya and Dr Samuel Broder, of the US National Cancer Institute, who pioneered the use of AZT (zidovudine) for AIDS patients, listed in *Nature* magazine last month eight potential research targets for drugs in combatting a retrovirus.

The MRC programme is proposing to encourage selected basic science laboratories to "reorientate their programmes to study these proteins."

There will surely be those who oppose the whole idea of directed research at as basic a level as this programme demands. They point, for example, to the failure of President Nixon's directed programme to cure cancer in the early 1970s, claiming central direction stifled initiatives, no matter how much money was spent.

But others say that the cancer programme generated much of the "enabling technology" which has already permitted rapid progress in identifying the AIDS virus.

For programme directors, the big issue may be not whether the science should be directed, but whether they can define a strategic role for British science in a huge international effort.

OUT OF THE BACKROOM

by David Fishlock

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The AIDS research programme is the brainchild of Sir James Gowans, the eminent Oxford immunologist who runs the Medical Research Council (MRC). He has persuaded the Government to earmark extra

Irish Times
25th March 1987

Guilty plea in AIDS triangle

A MAN who killed his male lover for exposing him to AIDS dropped a defence of justifiable homicide in Mineola, New York, on Monday and pleaded guilty to manslaughter.

Lorenzo Owens (20) is charged with murdering Kenneth Grice (24) last April in Grice's home. Owens told police that Grice's

revelation that he had AIDS, after they had sexual intercourse, enraged him so much he lost control and plunged a kitchen knife into Grice's neck.

Owens changed his mind, his lawyer, Mr John Lewis, said, when he learned that his 17-year-old girlfriend was pre-

pared to testify that he had sexual intercourse with her a few hours after the murder without informing her of his exposure to the disease.

Owens has tested negative for the AIDS virus, but doctors say it could still show up at a later date.
— (Reuter)

Irish Times
25th March 1987

INFORMATION ON AIDS

Sir,—Why is it that people cite religion/morality/ Christianity so tirelessly as a case against fighting AIDS with every available weapon?

In his letter of March 14th Mr Kenneth Bale praises the Lord that: "The great mass of Irish people continue loyal to the Judeo-Christian standards of morality enshrined in our Constitution." Such people who pontificate the laws of morality in the midst of a crisis such as this are reminiscent indeed of those biblical stoners who, seeing an unfortunate suffering a blatant malady feel their own latent faults eclipsed, and it satisfies them to purge another of both their sins. Alas that it be another "Christian" who indulges.

Man, that pathetic biped is mere flesh and blood, and the flesh is often weak. A human will certainly meander from the pristine laws of morality and Christianity in the course of his life. The difference between the Magdalen of today and that of Christ's time is that she lived to regret her waywardness. Others may not enjoy such a reprieve. Yet in his righteousness Mr Bale (and his

disciples) propose the divine laws of Christianity and morality as their *raison d'être*. Divinity of hell. That they in the name of Christ should in effect damn the person that He himself saved spiritually and physically is beyond all justification.

Doubtless Mr Bale would have modern man bury his talents in righteous folly rather than using them ruthlessly for survival, yet man cannot live on religion or morality alone. Perhaps Mr Bale would also bury the millions of sufferers of this plague there — with a moral and a prayer.

AIDS is a purely secular phenomenon — there is no moral or religious remedy for its present-day sufferers nor will there be for those who contract the disease in the future. Let us ensure prevention and seek cures for our people at any cost, before we look beyond the actual into the ideals of a belief or a code of morality which in the present day could be the death of us. — Yours, etc.,

HUGH D. McKENNA,
5 Adelaide Road,
Glathule,
Dun Laoghaire, Co Dublin.

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Aids line flooded

By KEN CURRAN

EDS of calls flooded the first confidential line today set up by the Eastern Health

day-long service was provided by coun- public health doctors who coped with up is a minute.

came from a n of the popu- many of the e from "wor- who thought ave caught the e.

women ring to their husbands got the disease on business or

ple wanted to u can get it g hands, from me cutlery or a bath.

re calls from ts' and gays. married, who ide their mar-

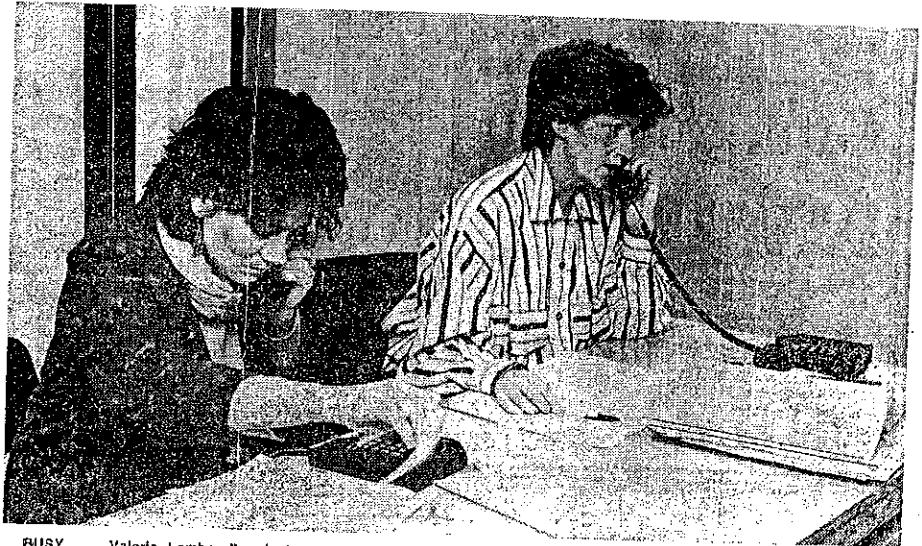
the callers and wanted hat they had , said hotline ctuary John- Community t with the h Board. ublic health

Hundreds call with worries

doctors and three public health nurses worked in shifts answering the phones at the Telecom Eireann office in Dame Street.

The phone-in was linked up to the Gay Byrne Radio Show.

Queries from gays were being dealt with by experts from the Gay Health Action Group. They pointed out that the recent media campaign on cross-Channel TV heightened people's awareness of the disease.



BUSY . . . Valerie Lambie, Ranelagh and Helen Maguire, Registrar in Community Medicine, Clonskeagh, manning the AIDS Helpline at the Telecom H.Q., College Green, today.

It is hoped to set up an AIDS action alliance on April 4 next, explained Mick Quinlan of the Action Group.

To date, nine people have died from AIDS in Ireland and 15 people have the disease.

Zachary Johnson hopes that each of the eight health boards will set up a counselling service for their own area.

"It is difficult for people in rural communities having to travel to clinics in Dublin or

Cork. They should be provided with a service nearby," he said.

The hotline idea was organised by Mr. Johnson and RTE's Gay 'Byrne Hour' producer, Philip Kampit.

The confidential AIDS' phone-in operates all day

today to give advice to the public on all aspects of the killer disease.

The phone number 795335 is not going into the station and RTE said it would be completely confidential. It will continue until 9 o'clock to-night.

Evening Herald, Thursday, March 26, 1987 12

AIDS alert for students

OVER 25,000 Irish students going abroad for the summer have been warned about the risks of catching AIDS.

The deputy president of the Students' Union of Ireland, Mr. Conor Lawlor, said most of the students going away for the summer for holidays or work were bound for high AIDS risk areas.

"At the moment, with the possibility of contracting AIDS at such a dangerous level, it is disgraceful and irresponsible that no effort has been made to educate this high risk group as to the dangers of this killer," he said.

Now the Trinity College Publications Committee is to produce an AIDS leaflet for students with support from the USI.

The leaflet will include information on the AIDS virus, how it is contracted, how it can be avoided and the availability of the HIV test around the country.

About 30,000 leaflets will be printed by the second week in April and will be distributed by direct mail or handed out to students around the country, said Julian Daly of the Students AIDS Action Group in Trinity College.

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Evening Press
26th March 1987

The church is dead

—Aids priest

'Heart of stone cannot be broken'

From Walter Schwarz in San Francisco

A CATHOLIC priest suffering from Aids told his congregation here that "the Church is dead" because he said the Vatican condemns homosexuality and fails to show compassion for Aids victims.

The congregation at St. Boniface Church—mostly members of Dignity, a 4,500-strong organisation of homosexual Catholics, including more than 200 priests—had been told the previous Sunday that Father Larry Tozio, aged 40, suffered from Aids.

They were told that Father Tozio, a Benedictine, had been absent from the parish helping Aids victims since he had been diagnosed as having the disease last September.

Father Tozio's sermon, which he preached sitting down, was the strongest statement to emerge so far in a growing campaign to confront the Pope when he comes here in September with moral controversies such as contraception, proposals for married priests and the treatment of homosexuals.

He said: "An institution that does not have a response of compassion can no longer claim to be in association with the spirit of God. An institution whose heart of stone cannot be broken by the catastrophe of our brothers whom we have buried again and again with Aids cannot claim to be one that offers us life. The Church is dead."

Speaking in a city where more than 60 people a month die of Aids, he also attacked the attitude of the secular community "that works hard and long to come up with a drug and then tells us it will cost the patient \$10,000 a year; it now looks as though health and longevity will be relegated to the privileged."

The US Catholic Church does not say how many of its 57,000 priests are homosexuals or have Aids. But recent research suggests that, while many priests have left to marry, the proportion of homosexuals among those remaining may have risen steeply. In some seminaries, it has been put as high as 50 per cent; Dignity officials say they know of 20 priests with Aids.

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New Scientist
26th March 1987

Risk from previous transfusions

A MERICANS who had blood transfusions between 1978 and spring 1985 should go for a test to see if they have antibodies against human immunodeficiency virus (HIV), the Centers for Disease Control (CDC) in Atlanta has advised.

Government scientists believe that about 12 000 people may have become infected with HIV between 1978, when the first cases of AIDS appeared, and 1985, when widespread screening of blood supplies began. The CDC is concerned that a few of these people are carriers of the disease. The centre has documented several cases in which such individuals have transmitted the infection to their sexual partners or children. The people at greatest risk are those who received many transfusions from supplies in cities where AIDS is most prevalent. □

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The anatomy of the virus

As pictures of the virus that causes AIDS slowly emerge, scientists have begun to understand its complicated structure. Knowing the intricate geometry of the virus sheds light on how it destroys the body's cells

Michael Koch



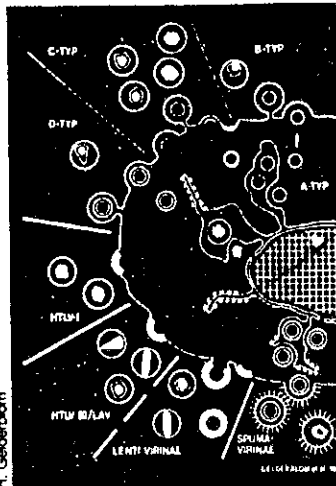
IN THE SUMMER of 1980, a patient in New York City died after a long and frustrating illness caused by infections that the body can normally fight with little or no problem. The event was one of many that marked a turning point in medical history. A pandemic was emerging that affected all corners of the world, claiming a startling toll

on human life. A year later, scientists found that the condition was the result of a breakdown of the immune system, the body's mechanism for fighting off infections. They called the condition acquired immune deficiency syndrome—AIDS.

Scientists all over the world were soon searching for the causative agent. At the beginning of 1983, this fervent research bore fruit: a team of French scientists, led by Luc Montagnier at the Pasteur Institute in Paris, identified and isolated a new virus from a man suffering from lymphadenopathy syndrome, a condition that often precedes full-blown AIDS. These researchers grew the virus in tissue cultures, and named it LAV, lymphadenopathy-associated virus.

Later in 1983, the same group of researchers isolated further viruses from patients suffering from full-blown AIDS, and called these viruses IDAV, or immune deficiency associated virus. After comparing this virus with the earlier strain of virus, LAV, the team from the Pasteur Institute found that they were the same virus, and so they named all viral isolates LAV, which now means lymphadenopathy AIDS virus.

In Britain, Abraham Karpas, at the University of Cambridge, also isolated a new virus from an AIDS patient, which he called C-LAV (Cambridge LAV) because of the similarity with the virus discovered by the Pasteur Institute. His findings, which included photographs of the virus, were published in the journal *Molecular Biology in Medicine*, but went virtually unnoticed, and this important contribution to AIDS research has still not received the



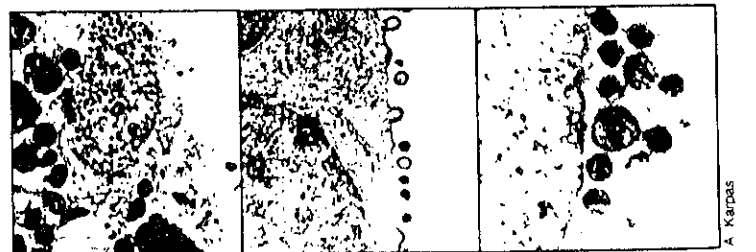
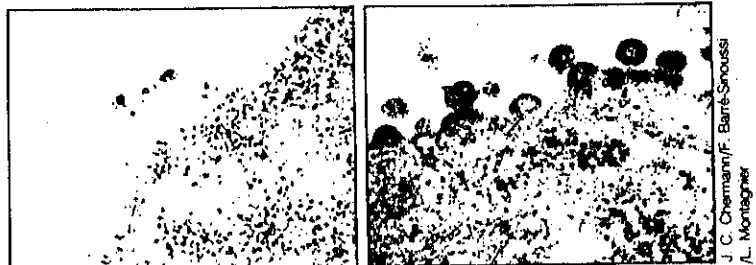
Budding of various retroviruses (above). HIV (bottom right) differs from the HTLV-I and -II (above right)



recognition it deserves.

At about the same time, Paul Feorino and co-workers from the Centers for Disease Control (CDC) in Atlanta, Georgia, also found a virus in AIDS patients. But they had difficulty growing it in tissue culture. All these researchers had noticed that the AIDS virus looked different to other known human viruses. It resembled certain animal viruses, called the lentiviruses.

Meanwhile, researchers led by Robert Gallo at the National Cancer Institute in Bethesda, Maryland, were searching for another type of virus in AIDS patients. This virus also belongs to the group of retroviruses (which can convert their RNA



Early pictures of HIV taken in 1983 by Montagnier's group (top) and Abraham Karpas of Cambridge University (bottom row)



Some of the best pictures yet, from Hans Gelderblom, of the virus budding from a cell (top) and invading a cell (below)

H. Gelderblom, Science, 4 May 1984

J. C. Chermann/F. Barre-Sinoussi
L. Montagnier

A. Karpas

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5. viruses emerge
and human T-cell



Computer-enhanced images of the virus, from Pasteur Institute

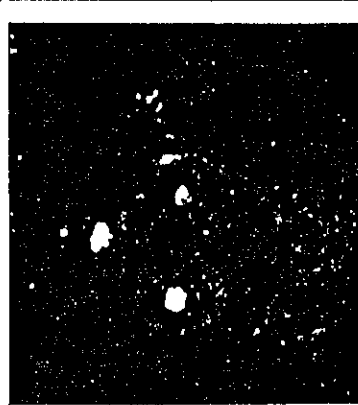
► into DNA in the infected cell) but to a subgroup called the oncoviruses. Gallo was focusing on HTLV-I, the human T-cell leukaemia/lymphoma virus type I. These viruses, also called cancer viruses because of their association with cancers, look quite different to lentiviruses under the electron microscope. "Lenti" means "slow" and refers to the length of time these viruses take to cause disease to develop.

When Gallo published his findings in May 1984, he called the AIDS virus HTLV-III, denoting that it was the third member of the group of known human oncoviruses. Later in that year, Jay Levy at the Cancer Research Center at the University of California, San Francisco, also isolated a virus from AIDS patients. Levy called this virus ARV, or AIDS associated retrovirus. The CDC meanwhile called its AIDS virus by the complicated name of LAV/HTLV-III-CDC-151, whereas Helga Rübsamen-Waigmann at the Georg-Speyer-Haus in Frankfurt came up with yet another name for the virus she isolated—AIDS associated virus, or AAV.

Once researchers had compared the structure of these viruses under the microscope, and looked at the genetic similarity of these viruses, it became clear that they should all share the same name. They were the same virus after all. In May 1986, the International Committee on the Taxonomy of Viruses agreed to call the virus HIV, the human immunodeficiency virus.

The question of whether HIV belongs to either the oncoviruses or the lentiviruses is more than of merely academic interest. The answer will help us to understand these crucial

Nilsson and Lindberg/Boehringer



Under the very highest magnification, the envelope proteins emerge (top). Free virus (above) buds from the surface folds of a white blood cell (right)



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points: how the epidemic will develop, how the virus will penetrate different groups in the population, how quickly it will spread, how many people it will kill and what the chances are for developing a vaccine or a cure. Detailed pictures of the virus under the electron microscope, taken by Hermann Frank and colleagues at the Max Planck Institute in Tübingen, West Germany, and Hans Gelderblom and co-workers at the Robert Koch Institute in Berlin, show how the AIDS virus, HIV, differs from the oncoviruses.

Other pictures of HIV's assembly in the cells that it infects, and of it emerging or "budding" from these cells, add further weight to the idea that the virus belongs to the subgroup of lentiviruses. This is further supported by phenomena such as antigenic drift (the rapid changes in the virus's outer envelope), antigen shedding (the loss of antigens from the envelope), and an unusually sophisticated regulation of viral replication, even involving self-inhibitory action. In addition, the virus has genetic structures, notably the reading frames *src*, *art*, (*tr*s), *3'orf*, *tat* and the R-region, which seem to be common and specific to the lentiviruses, although their function is not fully understood.

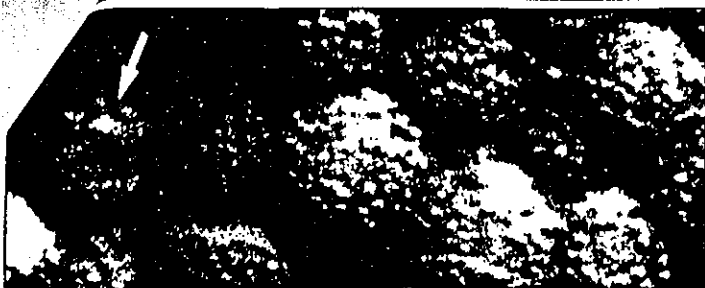
An important principle for the continued survival and spread of the virus is that it does not do too much damage to the cell it replicates in. A slow accumulation of viral precursors seems to prolong the survival time of the host cell, until some event accelerates reproduction of the virus, culminating in a final burst in replication. This complicated process results in the long incubation period specific to the lentiviruses, and helps the virus to spread.

Another feature of HIV is the ability of the virus to change the structure of its outer protein coat, the envelope. This ability to display so-called antigenic drift makes it difficult for the body's defence system, its antibodies, to identify and attack these proteins, the antigens. It also makes it difficult to make a vaccine for the same reason. HIV also sheds these proteins from the envelope, so making it difficult for antibodies to stick to the main structure of the virus. This antigen-shedding is analogous to a lizard losing its tail when attacked by a predator. These free antigens may also become attached to other cells, thereby directing the body's own antibodies to attack and destroy these cells.

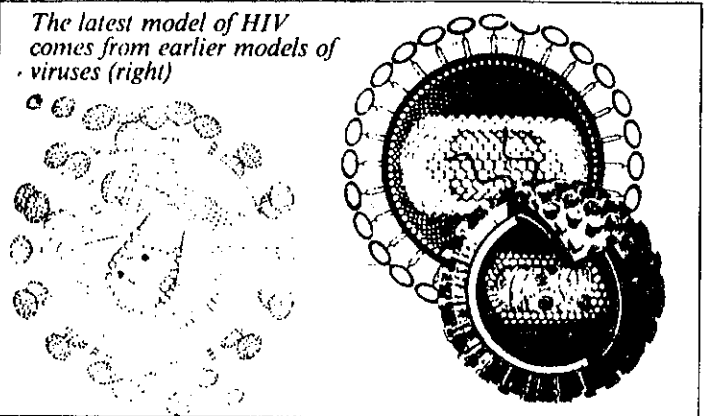
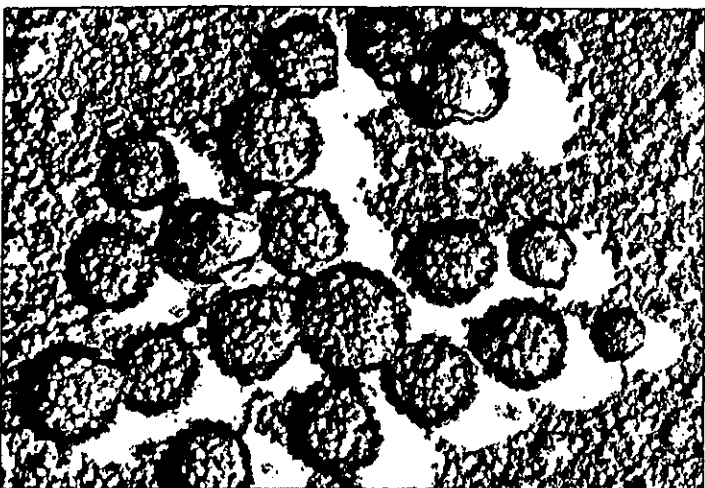
There are other features of the AIDS virus that other lentiviruses share. There is for instance in all retroviruses a certain protein, a glycoprotein, which protrudes through the envelope, sticking out on either side. This glycoprotein has two parts. The outer part, in HIV called gp120, is attached to another protein, in HIV called gp41, which sits in the viral membrane. The inner part of gp41 protein is unusually long, containing more than a hundred amino acids. This has hitherto been seen only in another lentivirus, the Visna virus. Once researchers had determined the genetic sequence of the AIDS virus—Simon Wain-Hobson of the Pasteur Institute was first to do this—and compared the genome with other viruses, the evidence that HIV was really a lentivirus, and not an oncovirus, became overwhelming.

Researchers now believe that the AIDS virus in humans had a common ancestor with the virus that is found in several African monkeys, in some causing so-called simian AIDS. The origins of the virus are shrouded in tropical darkness, but it seems likely that the virus jumped the "species barrier" somewhere in Central Africa, probably near the west coast of Lake Victoria, where the AIDS epidemic is at its worst. It could be the first time that a lentivirus has infected humans.

The size of the virus bears no relation to the havoc it has wreaked upon human health. The diameter of HIV is about 100 nanometres, or 0.1 micrometres. If we put a thousand viruses in a line and put a thousand of these lines next to each other, so making up a square of one million viruses, and then put a thousand of these squares on top of one another to make a cube of one thousand million viruses, this would be just visible to the naked eye. This dot would have a diameter of about one-tenth of a millimetre.

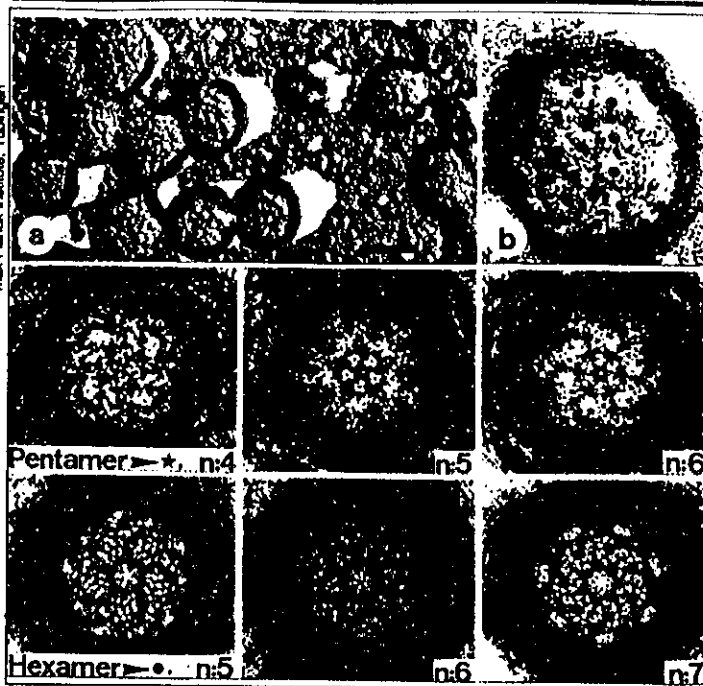


These shadowed-surface electron micrographs by Herman Frank show the icosahedral structure of the core (arrowed), and of envelope proteins shown in this photograph (below) by Hans Gelderblom



The three-dimensional structure of the virus appears to follow a regular geometric pattern. Work by Hermann Frank and others at the Max Planck Institute in Tübingen showed this for other viruses. Research by Gelderblom and colleagues at the Robert Koch Institute in Berlin suggests that the distribution of proteins of the viral surface is very much like a soccer ball made of 12 pentagons and 20 hexagons "stitched" together to make a sphere. A molecule of gp120 protein appears as a "knob" at the corners of the hexagons, with an extra molecule of the protein in the centre of each hexagon. Thus the total number of gp120 molecules comes to 80, which is consistent with the laboratory observations of Gelderblom and colleagues. If there were no gp120 molecules at the centre of the hexagons, there would be only 64 gp120 molecules per virus, which seems far too few. Similarly, if the gp120 molecules appeared at the centres of the pentagons as well as the hexagons, there would be 92 molecules per virus, which seems to be far too many.

Immediately inside the outer envelope of HIV, there is a core shell of protein surrounding the centre of the core which appears as a dense mass. Unlike HTLV-I and HTLV-II, there is only a small distance between the core shell and the outer



Pentagonal and hexagonal patterns emerge when Gelderblom rotates these surface structures in stroboscopic light



The shape of the central core becomes clear in these electron micrographs: a cone with an indented core

envelope. A comparison of the electron micrographs of the three viruses shows this quite clearly (see p 46). It seems that the core shell is composed of protein that is arranged in an icosahedral structure.

The envelope of HIV also contains other proteins, known as HLA (human-leucocyte-associated) antigens. These are believed to derive from the membrane of the human cells that the virus derives from. When the virus emerges or "buds" from these cells, it takes some of these HLA antigens with it. These HLA proteins do not appear to form any set pattern in the geometry of the envelope. It may be that the distribution of these HLA antigens in the envelope confers individuality to the viruses.

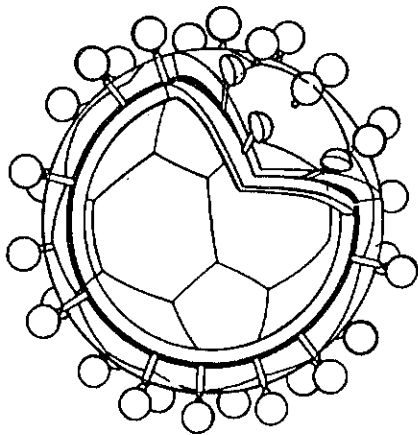
Work by Preston Marx and Robert Munn at the University of California, Davis, sheds further light on the structure of this core shell protein. They analysed the shadows that appeared around the core. Sifting through hundreds of different electron micrographs of the virus, Marx and Munn proposed that the core shell was in fact a complicated shape called a deltaicosahedron. This is a polygonal structure composed of 60 triangular elements forming a mix of alternating hexagonal and pentagonal structures which partly

H. Frank et al./Max Planck Institute, Tübingen

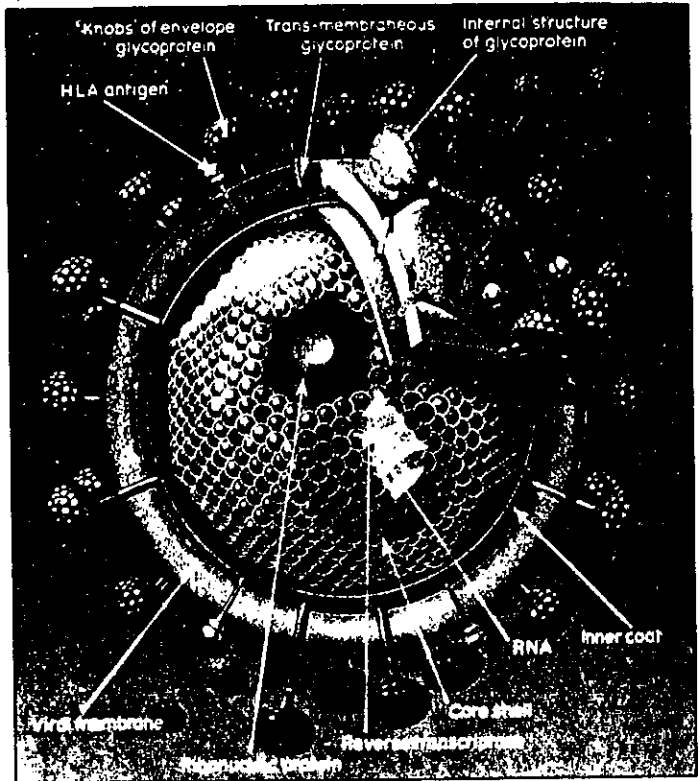
M. Özai & H. Gelderblom/Robert Koch Institute



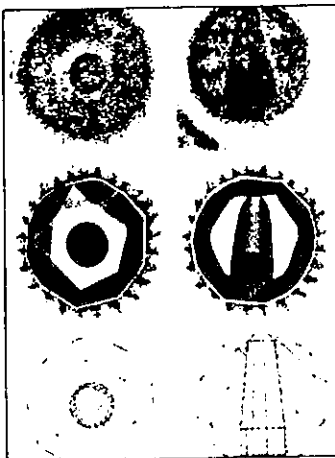
H. Gelderblom/Robert Koch Institute



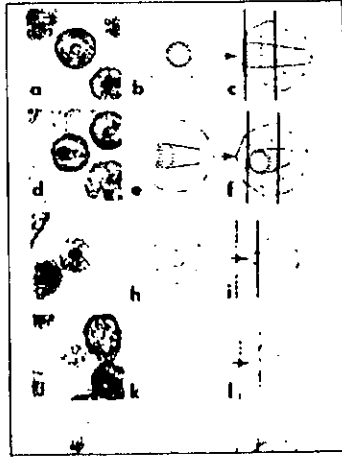
An electron micrograph (top left) of a section between the viral envelope and core shell reveals the pentagonal and hexagonal symmetry of the virus—just like a soccer ball. The final model (right) cannot be considered to be true and definitive. It marks the starting point for better models to follow in the future



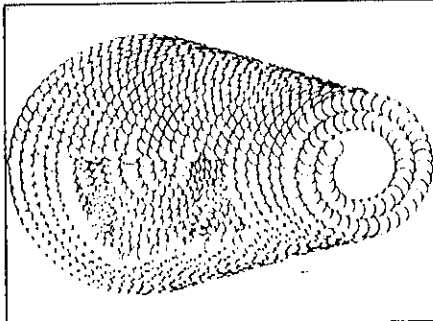
M. G. Koch/H. R. Gelderblom/P. A. Marx



P. A. Marx, R. J. Munn, K. I. Joy



From pictures of the virus, Preston Marx and others from California University have built a computer model of its structure



The cone of the virus: inside lurks its deadly secret. The structure shown here has yet to be confirmed, although it is based on what we know of other known ribonucleoproteins

penetrate each other. With the assistance of another researcher, Kenneth Joy, who designed a computer model of this body, they went about investigating the various shapes this core shell could form.

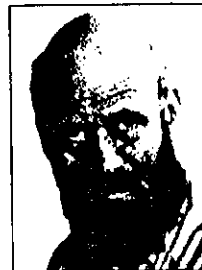
What about the central core itself? What is the structure of this body, which contains the vital genetic information for replication of the virus? The immediate impression of the

central core is that it is a cone which is hollow and open at the narrow end, the "top". The other end appears to have a dimple-like indentation, rather like the bottom of a champagne bottle, which could be there for the same effect, to give the hollow cone strength. Alternatively, the indentation could be there to pack more protein into a given space.

The idea that the base of the cone has this indentation is supported by the observation that this part of the core appears more dense under the microscope. This is consistent with the microscopist looking at double layers of the cone's wall, due to the invagination. In some sections, the cone is cut down the middle and this indentation can be seen. In other pictures, the indentation has blown out, appearing as a protrusion at the base.

Research has not yet uncovered the structure of the ribonucleic acid and the reverse transcriptase enzyme lurking inside the cone—the two elements that give the virus its deadly signature.

Dr Michael Koch is an epidemiologist working in Sweden.



Gelderblom



Marx

Michael Koch would like to thank the following: H. R. Gelderblom, M. Özel, G. Pauli (Robert Koch Institute, Berlin) P. A. Marx, R. J. Munn, K. I. Joy (University of California, Davis) H. Frank, W. Schäfer, H. Schwarz (Max Planck Institute, Tübingen) L. Nilsson, J. Lindberg (Karolinska Institute, Stockholm) J. C. Chermann, F. Barré-Sinoussi, C. Dauguet, P. Picouet, L. Montagnier (Pasteur Institute, Paris) A. Karpas, W. Gillson (University of Cambridge) P. M. Feorino, E. Palmer (CDC, Atlanta) J. A. Levy, L. Oshiro (Cancer Research Center, University of California, San Francisco) H. Wolf, S. Modrow (Max von Pettenkofer Institute, Munich) Künstlerische Gestaltung, H. U. Osterwalder, I. and W. Desmarowitz (Graphico, Hamburg.)

The virus behind the disease

news scientist AIDS BRIEFING

THE early 1980s, AIDS was a mysterious disease. No one knew what caused it, although researchers suspected that some sort of infectious agent was to blame. In a remarkably short time virologists have identified the agent, a virus called human immunodeficiency virus (HIV). By 1990, scientists will probably know more about the many different strains of HIV than about any other virus. We already have a good picture of what the virus is, and how it causes such harm.

Like all viruses, HIV is just genes wrapped up in a simple chemical coat. Its genetic material, made of RNA, lies at the heart of the virus. The coat is two layers of protein and a fatty membrane which has proteins with sugars attached to them (glycoproteins) embedded in it. Along with the genetic material are some molecules of an enzyme called "reverse transcriptase" which the virus uses to multiply itself. That's all the virus is—some RNA, a few proteins and glycoproteins, and a simple lipid membrane.

The virus can enter only certain types of cells in the body—those that have the right receptors on their surface. The proteins on the virus bind to the protein receptors. Cells need receptors for their own purposes, but they also act as chemical "handles" that the viral proteins latch on to.

Various types of cells carry receptors that the virus can bind to. But most important, as far as HIV is concerned, are the receptors on the surface of a type of white blood cells, lymphocytes, known as T4 cells. The virus first binds to receptors on these T4 cells and then enters the cells.

The virus could enter the cells in either of two ways. It might happen when the cell membrane folds inwards to form a tiny sacle, which carries the virus into the cell. Cells constantly take in materials from their environment in this way, a process called "endocytosis". Eventually the vesicle carrying the virus releases it into the cytoplasm of the cell. Alternatively, the virus might take a quicker route, fusing its surrounding membrane with the membrane of the cell. Once in the cytoplasm, the viral structure disintegrates, releasing the RNA and the copies of the reverse transcriptase enzyme. Now the infection begins in earnest.

The reverse transcriptase first copies the viral RNA into DNA—the form of genetic material that is found in cells. The DNA then enters the nucleus of the cell, where it becomes incorporated into the cell's own DNA. This is the crucial act of piracy that makes the virus a permanent part of an infected person's own cells.

Once the viral genes have become part of the cell's DNA, a period of calm begins. The virus as it was ceases to exist. The original infective virus has given rise to a latent "provirus" which sits in the cell's DNA and awaits chemical signals that prompt it to start multiplying. Remember that the most important type

of infected cells are the white blood cells known as T4 cells. These cells form a crucial part of the human immune system. The signal that brings the latent provirus to life is probably the arrival in the body of some other infection or foreign material which activates the T4 cell.

The cells of our immune system are usually activated by specific parts of foreign chemicals, known as "antigens". Different cells of the immune system respond to different antigens. When a particular antigen activates a T4 cell that is infected with HIV, it also activates the latent viral genes. Suddenly, the cell begins to make copies of the viral genes in the form of messenger RNA. This genetic intermediary travels out of the nucleus and into the cytoplasm. The messenger RNA then starts off the production of the viral proteins, which the virus sheds when it moved into the nucleus. It also makes copies of the strand of viral RNA that will serve as the genetic "hearts" of new virus particles.

Within these activated cells the viral proteins and RNAs begin to assemble into virus particles. These viruses are almost complete, but lack the outside fatty membranes. The new viruses begin to "bud out" from beneath the membranes of the infected cells. As they bud out they become surrounded by bits of the cell's membrane, and then break free as complete viruses.

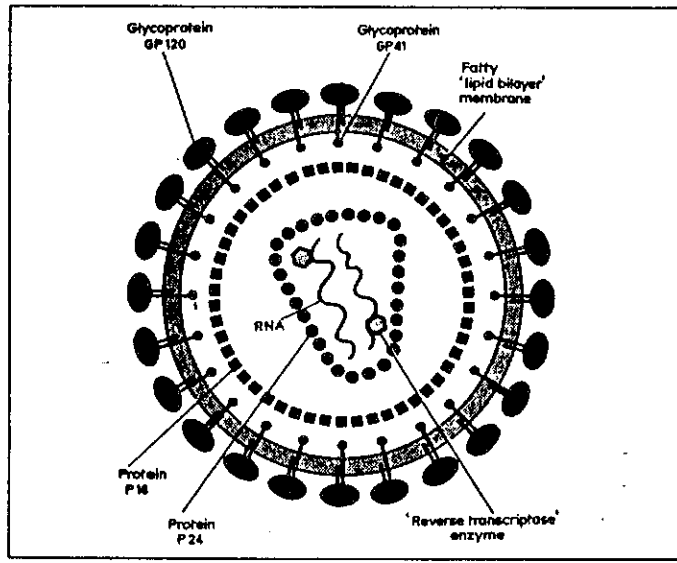
The original HIV that infected the T4 cell and inserted its genes into the DNA of the cell has now spawned a new

generation of viruses. It all happens automatically, thanks to the chemical interactions between the virus and the cell it infects. The raw materials needed to make the new viruses have been taken from the supplies in the cell.

The virus then spreads. It spreads to other T4 cells, including many that will eventually be activated by different antigens. It also spreads to various other types of cell throughout the body including brain cells. There it can cause damaging changes (see p 38). The most crucial effect of HIV infection, however, is that it eventually kills the T4 cells in which it multiplies.

No one knows exactly how HIV kills infected T4 cells, but there are several plausible ideas. One suggestion is that the viruses punch holes in the cell membrane as they bud out from an infected cell. Vital cell components escape through the sieve-like membrane until the cell can no longer survive. Other cells of the immune system may also destroy the infected T4 cells. Whatever causes the cells to die, the loss of T4 lymphocytes selectively damages immune defences, leaving the body vulnerable to infections.

Andrew Scott



How the course of the disease varies

NOT EVERYONE who is infected with human immunodeficiency virus (HIV) reacts in the same way. Some people have a brief illness similar to influenza or glandular fever at around the time that antibodies develop against the virus—between four weeks and four months from the time of infection. Even so, some people will remain symptomless for several years. Others will be less lucky. Estimates vary, but probably about 60 or 70 per cent of infected people will have some symptoms by the time that three years is up.

About 30 to 40 per cent of people infected with HIV for three years will develop mild symptoms such as fever, sweats, aches, fatigue, unexplained loss of weight, sickness and diarrhoea. There may also be shingles and herpes. Doctors use the term AIDS-related complex or ARC to describe

this set of symptoms.

People with antibodies to HIV may also suffer swollen lymph glands, in the neck and armpits, for example. The medical term for this condition is "persistent generalised lymphadenopathy" or PGL for short.

Out of a group of people who have had HIV infection for three years, 15 to 20 per cent will go on to develop the syndrome of severe infections and symptoms categorised as AIDS. These conditions include lung disease, the skin tumours called Kaposi's sarcoma, severe fungal infection of the oesophagus and severe diarrhoea. People with the kinds of lung infection common in AIDS suffer progressive shortness of breath, a dry cough and fevers. Kaposi's sarcoma appears as a purplish mark similar to a bruise. HIV infection can also affect the brain (see p 38).

SL

Vaccine on trial in Zaire

PRELIMINARY results from the first trial of a vaccine against AIDS have proved promising, according to a group of French researchers. They tested the vaccine on themselves and on volunteers in Zaire.

The researchers made the vaccine by splicing the gene that codes for the envelope of the AIDS virus into the virus that causes cowpox (vaccinia). (The vaccinia virus is the basis of the smallpox vaccine.) The researchers, led by Daniel Zagury of the Université Pierre et Marie Curie in Paris, used a strain of the AIDS virus called HTLV-III_B. They wanted to know whether the vaccine derived from this strain of the virus would be effective against other strains: antibodies produced in response to one strain may not identify and attack another strain.

Zagury tested the vaccine on himself. His immune system produced antibodies against HTLV-III_B, but these antibodies did not recognise another strain of the virus, called HTLV-III_{RT}. The French researchers also looked at the vaccine's ability to encourage a cellular immune

response, when the body produces "killer" cells that can identify and attack cells carrying the virus. They found that the vaccine did seem to encourage the cellular immune response against both strains, although the effect was less marked against the RF strain. Writing in last week's *Nature* (vol 326, p 249), they say: "These results show that immunisation of humans with a recombinant vaccinia virus expressing HTLV-III_B envelope glycoproteins can trigger a primary immune response not only against the immunising strain but also... against a very different strain."

The researchers have given boosters to Zagury and the other volunteers to see whether the vaccine can induce the body to produce antibodies that will recognise different strains of the virus. If this does not prove successful in inducing a good immune response, then "alternative approaches—such as the use of multiple recombinant viruses, each expressing a different subtype of HIV [antigen] or the use of alternative boosters—will be explored", the researchers say. □

Sc

AIDS—not gentle on the mind

DOCTORS now estimate that 60 per cent of patients with AIDS will suffer from dementia before they die. They will have problems with memory, thinking and behaviour. Many AIDS patients first go to their doctor because they are suffering from symptoms of brain disease. For a time, scientists thought that these neurological problems were a secondary effect of infection with the HIV, the virus that causes AIDS. But within the past few years, it has become clear that the virus attacks the brain directly.

Most viruses do not enter the brain easily, and other reasons for the dementia seemed more likely at first. The general effect of AIDS is to lower the whole body's resistance to infection. So AIDS patients suffer from a number of "opportunistic" infections of the brain, just as they suffer from an unusually high number of cancers, bacterial and viral infections of other parts of the body. These diseases of the brain include some forms of brain tumour, meningitis and progressive multifocal leukoencephalopathy, a viral disease that attacks the insulating sheath around the long fibres of nerve cells.

Even these diseases could not fully explain why AIDS patients became pathetic, forgetful and mentally disturbed. With reasonably successful treatment for the opportunistic infections, some of the symptoms still remained. It might seem perfectly understandable that people

should go out of their minds while living with the awful knowledge that they have the disease, and some clinicians put the symptoms down to depression. But when the patients died, their brains revealed that something more devastating had been at work. The brains appeared shrunken, and there were small groups of inflammatory cells throughout the tissue. Other patients had a condition in which there was no inflammation, but spaces appeared in the "white matter" (bundles of connecting fibres) with no trace of opportunistic infections. It looked like some form of viral infection, but which virus was responsible was still a mystery.

When babies born to mothers with HIV turned out to have shrunken brains with many diseased cells, it began to look certain that HIV itself was the culprit. Unlike adults with AIDS disease, these children were unlikely to have picked up opportunistic infections in their short lives. At about this time, teams in France and the US succeeded in isolating the virus from the blood of patients. Once they knew its identity, it was a relatively simple matter for scientists to look directly for the virus in the brain.

We now know that people with AIDS who are losing their mental faculties almost invariably have the virus in their brains. But scientists have not yet discovered how it gets there, what types of cell it invades or by what mechanism it destroys brain tissue.

So far no one has found it inside nerve cells. It may attack the glial cells which protect the environment of the nerve cells and manufacture the insulation around their fibres, but the evidence for this is still indirect. The virus seems mainly to affect fibre pathways in the deeper structures of the brain. Brain scans that measure the metabolic activity of the tissue—the rate at which it is using energy—show that the metabolic rate is reduced over the whole brain, but most of all in the basal ganglia, a group of structures at the base of the fore-brain which are concerned principally with controlling movement.

But there is no single picture of brain infection with HIV. According to Donald Price of Johns Hopkins University in the US, the dementia suffered by AIDS patients is only one of its manifestations. It can also resemble other diseases: the neurological complications of syphilis, for example. In addition, the pattern of damage in those who are demented is different from that of Alzheimer's disease, the most common form of senile dementia. In fact, Price says, it is hard to see why some patients with AIDS should be as demented as they are.

No other virus belonging to the same family as HIV (the retroviruses) is known to cause brain disease in humans. But there are retroviruses that cause such diseases in animals. Sheep suffer from a disease called visna in which inflammatory cells appear

Pheonix
27th March 1987



Sc

Phoenix
27th March 1987

GOVT. AIDS KIT

THE NEW Minister of State at the Department of AIDS has officially launched the first AIDS information kit.

Speaking from a nuclear-style concrete bunker, and wearing the latest in Selafield protective clothing, the Minister stressed that there was absolutely no cause for alarm among the general public.

"Normal sexual relations are completely safe," she explained, "providing that couples follow government advice and avoid all physical contact."

However, she added a stern warning that the country could expect no fall in the

number of AIDS cases until there was a significant drop in the unemployment figures. S.1

THAT EXPLICIT GOVERNMENT WARNING

1. AIDS is a very bad thing.
2. It can be caught in all kinds of dirty ways.
3. Surely it's not necessary to spell these out.
4. There's been too much talk about this filthy topic already.
5. Suffice it to say that God punishes all sex maniacs.
6. So don't say you've not been warned!

(Issued by the Catholic Truth Society)

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* * *
BAVARIA'S AIDS CLAMPDOWN outrages civil libertarians.

The state government's unilateral decision to require AIDS tests of certain groups—non-EC foreigners seeking residence permits, civil service job applicants and those at high risk of contracting the syndrome—causes an uproar elsewhere in West Germany. "It is intolerable that a party calling itself Christian should stigmatize citizens suffering from a grave disease and banish them from society," says Renate Schmidt, the opposition SPD's deputy floor leader. The chairman of an AIDS clinic in Berlin accuses Munich of paranoia, adding, "What is worse is that the controls could give those people who so far are unaffected a false sense of security."

Governor Strauss's move comes after his Christian Socialist Union Party failed to win agreement by the other Bonn coalition parties to enact a series of national anti-AIDS measures, including compulsory listing in government data banks of all carriers of the virus. Other members of Chancellor Kohl's government rejected the motion as too severe and inhumane, and they're likely to press for repeal of Bavaria's solo step.

Authorities estimate that as many as 100,000 West Germans carry the AIDS virus. Of the nation's 907 recorded cases, 416 victims have died.

SW

Irish Times
28th March 1987

Million Africans could die of AIDS, report

AT LEAST one million Africans, mostly in central Africa, will probably die of AIDS in the next decade, warns a report published this week on AIDS and the Third World, adding that the figure is "probably a considerable underestimate."

The report, a revised and updated account of a study first published last year by the Panos Institute in London, says that AIDS has spread beyond the US, Europe and central Africa and has now reached at least 127 of the world's 159 countries.

But one chapter in the report highlights the devastating impact that the virus is having — and will have — on the worst hit countries of central and east Africa, notably Zaire, Zambia, Rwanda, Uganda and Kenya.

AIDS in Africa", says the study, "does not only threaten individual lives. The survival of whole industries and national economies may be at stake."

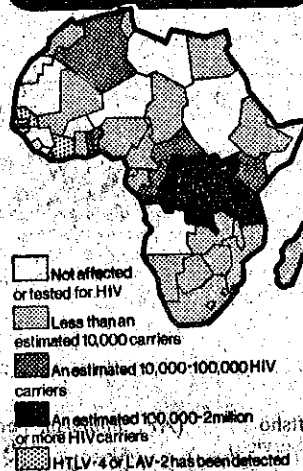
On the Zambian Copperbelt, for example, the country's industrial heartland where copper mines produce over 90 per cent of export earnings, 68 per cent of the men who tested HIV positive (HIV is the human immunodeficiency virus which causes AIDS) are skilled professionals.

In the capitals of the worst hit countries, says the report, it is the young, skilled urban professionals, in whom their countries have invested scarce resources, who are either already infected or are at serious risk.

"This young elite represents Africa's first post-independence generation to come to power." And they will die in increasing numbers: "The political, social, economic and psychological impact of this gathering death-march cannot be underestimated".

— (Financial Times Service).

AIDS in Africa



54

WORLD NEWS

Europe pins hopes on safe-sex campaigns in battle with AIDS

From Rebecca Franceskides, in Brussels.

EVERY WEEK, 35 new cases of AIDS are reported in the EEC. Every nine months, the number of cases doubles. At the current rate, there will be 100,000 victims by 1990.

By autumn last year, a total of 3,154 cases were reported in the EEC. This compares with 30,000 cases of AIDS in the US expected to rise to 300,000 by 1991.

The spread of the disease does not stop there. Medical estimates show that every person with AIDS, there are 50 to 100 carriers of the virus suffering none of the symptoms.

EEC countries are co-ordinating their research efforts for a cure for the virus and keeping a close watch on each others progress to combat AIDS.

All have taken some preventive action. Compulsory screening of all blood donors, information and health education campaigns of the high-risk groups such as homosexuals, prostitutes and drug addicts who inject, and general campaigns especially for the young. The highest incidence of AIDS per population is still in France and Britain, and this is reflected in the large budget being set aside for their public information campaigns.

All EEC countries now accept that AIDS is not just a problem of homosexual communities or of drug addicts. About 5 per cent of cases result from heterosexual sexual contact.

EEC figures show that 90 per cent of the victims are male. About 25 per cent are between 20 and 29 years old, 35 per cent are between 30 and 39 years old, 20 per cent are between 40 and 49 years old, and one per cent of the victims are less than a year old.

The babies either had a mother with AIDS or got the virus through a blood transfusion.

Of the known cases, 74 per cent are homosexual or bisexual men, 16 per cent are intravenous drug users, 6 per cent received blood transfusions and five per cent do not belong to any of the risk groups. Of the total in the EEC, five per cent of the victims were African, mostly from Zaire.

Over 50 per cent of AIDS patients die within a year after diagnosis and another 30 per cent within the following two or three years. The incubation period could be three to 10 years and between 25 to 50 per cent of AIDS carriers can develop the disease.

The EEC estimates that it costs between £55,000 and £115,000 to treat each AIDS victim.

The first measures taken by all EEC countries was the screening of blood or blood products to

protect against transmission.

Compulsory screening of different groups — be it foreign students, people entering the country or health care workers — has been proposed but opposition remains great and no country has been able to enforce it, at least openly. Voluntary, free and anonymous screening services are increasingly available.

Preventive measures have focused on encouraging a change in sexual behaviour, although the promotion of condoms has not been as great in all EEC countries.

In only Britain, Denmark, the Netherlands and France is the use of condoms openly encouraged. Opposition to relaxing further publicity on condoms exists in Greece and Spain.

Preliminary results suggest that "safe sex" campaigns have had a positive effect in reducing the spread of the disease. There is evidence these campaigns among homosexual groups have also resulted in a fall in other venereal diseases such as anal gonorrhoea.

This is also reflected in US results. A survey showed that five years ago, the number of US victims was doubling every five months. By the end of 1984, it was every nine months; by last December, every 15 months. Figures from the government's Centres for Disease Control also show that in New York and San Francisco the incidence of rectal gonorrhoea and syphilis — two reliable indicators of unprotected sexual activity — are down by as much as 85 per cent since 1980.

Campaigns for drug addicts who inject their drug are becoming more common. The Netherlands, however, has spearheaded work in this field. Apart from general information to drug users on how they can protect themselves, prostitutes who are also addicts have been supplied with drugs, and attempts have been made to encourage substitution of drugs that do not need to be injected from heroin to methadone.

The most controversial programmes are the provision of sterile needles to addicts. These so-called needle exchange programmes have now been in practice in the Netherlands since 1983. Last year, the programme cost over £600,000.

Drug users have been the group least concerned with their own health as for many the need for the drug is more important.

Spain and Italy, both with large numbers of drug users, are thinking of starting similar needle exchange programmes.

The Dutch authorities defend their needle exchange programme by saying that addicts will continue to inject themselves and so

it is necessary to protect them by giving sterile needles, so preventing needle sharing, the major source of spreading AIDS. The programme is accompanied with information on "safe sex".

The confidence of drug users was gained by working with their representatives, the junkie associations. According to Dutch figures, only three per cent of those with AIDS in the Netherlands are drug users, compared to the US figure of 25 per cent.

The Dutch authorities maintain that there has been no increase in the frequency of drug taking as a result of the needle exchange programmes. There is still opposition to the programme in the country, but the authorities argue that at present the prevention of AIDS is more important than drug addiction.

However, drug prevention programmes are carried out in conjunction, in the hope of getting people off heroin. Between 50 and 75 per cent of the total drug addict population in the Netherlands is in touch with a treatment centre and the needle exchange programme is expected to increase this number.

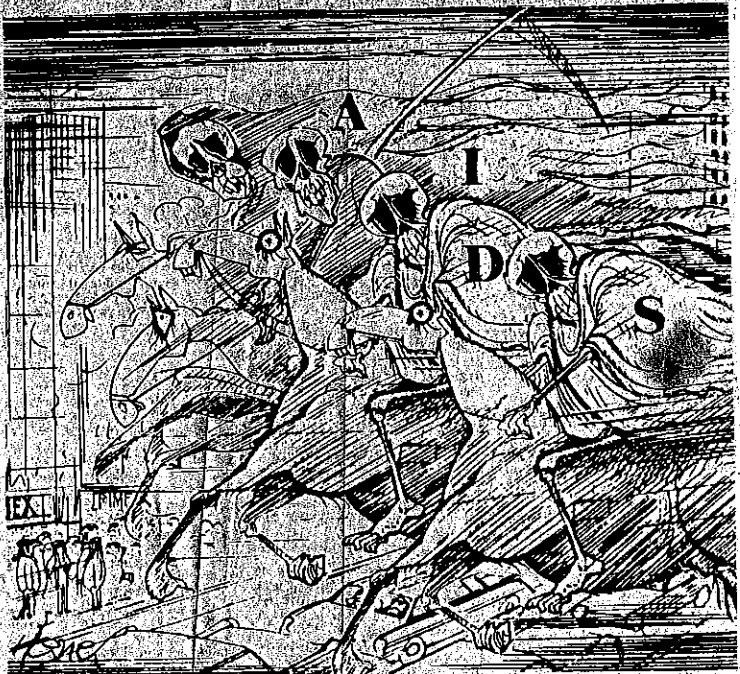
Nordic homosexuals worst hit

A NOTICEABLE feature of the incidence of AIDS in the Scandinavian countries is that the proportion of homosexual and bisexual men among the confirmed cases is overwhelming. The other main risk groups, intravenous drug abusers, haemophiliacs and transfusion recipients, are under-represented by comparison with most other European countries.

The campaign against AIDS is now being co-ordinated through the Nordic Council. There are no plans for mass screenings of all or part of the populations but blood donations have now all been tested, and it is likely that a special voluntary scheme for testing pregnant women will be instituted in the near future.

The Finnish health authorities announced earlier this month that foreign students may be tested for AIDS in the future, but none of the other countries has plans for controlling people entering the country. Sweden offers a voluntary test to immigrants from tropical countries. No restrictions of any kind are planned on the free movement or employment of those infected with the disease.

Denmark is among the worst affected countries in Europe. A total of 146 cases have now been confirmed, of whom 77 have died. The response of the Danish



By HANEL in Frankfurter Allgemeine.

THE Nordic Council is co-ordinating the AIDS campaign in the Scandinavian countries, as SEAMUS MURPHY reports from Copenhagen.

authorities has served as a model for the other Nordic countries.

From the very beginning, Denmark rejected all forms of compulsion and enforcement in the fight against AIDS. Technically it is a sexually-transmitted disease and therefore notifiable to the authorities, but there is no public registration of individual cases. Enforcement might have been taken in the form of compelling those affected to disclose the names of persons with whom they have had sexual relations, but it was reckoned that the price to be paid in terms of loss of the co-operation of high-risk groups was too great. The disease would be even more dangerous if driven underground. One example of this approach is the prohibition of hypodermic syringes for drug addicts to prevent the sharing of needles.

The whole direction of the Danish campaign can be summed up in one word: condoms. The message is direct, explicit and seemingly effective — the incidence of all sexually-transmitted diseases has fallen off sharply.

No-one who has reached the use of reason in Denmark can be in any doubt as to precisely which sexual practices are most dangerous. TV and cinema spots, newspaper advertising, posters and schools videos preach one simple message: safe sex. Pictures of huge 18 foot condoms adorn the sides of Copenhagen buses. The merest hint of moralising has been avoided and abstinence is not treated as a serious alternative.

The special AIDS secretariat has planned its campaign in active collaboration with the national association of gays and lesbians and has shown a quite extraordinary initiative in reaching out to high-risk groups. They have even placed false advertisements in homosexual contact magazines, quoting their own telephone number at the National Health Board.

Sweden has 100 confirmed cases, of whom 51 have died. There is a slightly sterner attitude in Stockholm and plans are under way to close the city's gay saunas.

Norway has 99 confirmed

cases, of whom 24 have died. As in the other countries, the approach is voluntary rather than regulatory, based upon a high-pressure campaign of education and persuasion designed to modify sexual behaviour.

Norway is by far the most conservative of the Scandinavian countries in matters sexual, but the highly explicit, and indeed highly graphic, promotion of the use of condoms seems to be meeting with public approval. The only legislation planned is actually designed to strengthen the rights of AIDS patients to privacy and fair treatment.

There are 17 confirmed cases of AIDS in Finland, of whom 12 have died. There are no drug addicts among them, but intravenous injection of hard drugs is rare in Finland.

Any sort of mass screening or compulsion has been rejected, but the Finnish education campaign is by far the most comprehensive of the four countries. Every household in the country has received a pamphlet on safe sex and use of the condoms.

This was followed up by a special campaign to reach the 16-21 year olds. Everybody in this age group received a special newsletter on AIDS and other sexual diseases. Inside was a free condom.

54

Campaigns stepped up with leap in figures

Luxembourg

LUXEMBOURG had five reported AIDS cases in 1986, and the authorities have kept their campaign confined to informing those working in the health sector. This year, they are expecting to start a campaign in schools. A leaflet on AIDS has been distributed to particular sections of the public.

Belgium

THE influence of the Catholic Church has kept the AIDS campaign low-keyed and off the television screens. A major documentary in February, however, had the highest viewer rating of the season, indicating the increased pressure on the government to come forward with a more explicit campaign.

In response, the government has marked 1987 as the year it will launch its major campaign. The most controversial proposal is the compulsory screening for the AIDS virus of all African students, both the new arrivals and those that have been in the country for a number of years. Opposition to the proposal has been enormous.

Belgium has one of the highest rates of AIDS cases per capita — 18.2 per million population. However, the figure is deceptive as 50 per cent of the cases are Zairians

REBECCA FRANCESKIDES takes a country-by-country look at the problem.

Greece

AFRAID that with tourism will come a new wave of AIDS, the government has already prepared leaflets to be distributed by taxi drivers to newly arrived tourists warning of the AIDS virus and advising "safe sex."

A major campaign on television and in newspapers has been launched this year.

In Greece, the first two cases of AIDS were reported in 1984. By October 1986, the number had risen to 25. Little mention is made of condoms as the authorities remain shy in their campaign.

Italy

THE Catholic Church has not kept a low profile in the Italian campaign against the AIDS virus that has been targeted towards high risk groups with little information given to the general public.

In certain cities, campaigns have taken place in prisons to ensure that condoms are used. In the major industrial cities, however, information has been forthcoming stressing the need to use condoms.

West Germany

THE government has widely used the media and has distributed leaflets to inform high risk groups of the danger of AIDS.

In Bavaria, complaints have come from the homosexual community because of compulsory testing for the virus. In Munich a "pink list" is known to be held by police authorities.

Prostitutes in West Germany, authorised to work in protected buildings, have also complained that the public authorities have done little to help them in their fight to force clients to use condoms.

By the end of 1983, there were 42 AIDS cases reported in West Germany.

This rose to a total of 675 cases by October, 1986.

users who have taught the disease through infected needles.

The high proportion of drug users in the country has prompted the authorities to consider needle exchange programmes.

Church opposition to publicity encouraging use of condoms remains high, although people working at ground level are calling for such measures.

The Netherlands

THE Netherlands has one of the most extensive campaigns in the EEC, especially with drug users. Since 1983, when they started, special health education programmes have been directed at high risk groups. Since 1986, the publicity on the use of condoms by heterosexuals has been widespread.

The authorities are spending over £700,000 to promote this campaign. However, the accent is put on all sexually transmitted diseases and not just AIDS.

The AIDS information line set up by homosexual groups now helps heterosexual people deal with the problems of AIDS.

In 1983, the number of reported AIDS cases was 12, rising to over 180 by October, 1986. An exchange of needles campaign has started and other EEC countries are keeping a close eye on its success.

The Netherlands is the only EEC country whose drug addict population is organised in an association and the ministry said that their help has been crucial in the successful outcome of the programme.

A national co-ordinating committee has been set up with members of associations representing all risk groups, prostitutes, homosexuals and junkies. Prostitutes' organisations have also received money to encourage "safe sex" among their clients.

France

THE French government has put aside over £44 million for the AIDS campaign. There is a clear accent on the use of condoms and the need to practice "safe sex."

The campaign is also trying to educate the public not to shun those with the AIDS virus.

The prohibition on the advertising of condoms has been relaxed, and the government is now considering a needle exchange programme to reduce the spread of the disease among drug addicts.

France has the highest number of reported cases in the EEC. In October, 1983, this figure stood at 94; by 1986, it rose to a total of 1,050 reported cases of AIDS.

A special campaign has also started for conscripts being sent to Africa and specific information is being given to prison authorities.

Irish Times
28th March 1987

Death toll in UK 377 so far

By Our London Staff

AT THE end of February, official figures put the number of AIDS cases in Britain at 731, with consequent deaths at 377. These figures confirmed predictions that the number of cases is doubling every nine months.

Homosexuals continue to be the most vulnerable group with 640 cases, of whom 317 have died. Haemophiliacs are the next largest group (28, with 22 deaths), but the disease is beginning to spread to heterosexuals.

More than half the cases are in the four regional health areas around London.

The number of women with AIDS totalled 23; seven babies born to infected mothers have developed the disease and four have died.

A nationwide advertising campaign started last month with distribution of explanatory and advisory booklets to every household. Concurrently came large-scale posters using "Don't die of ignorance" as the key phrase. TV and radio carried similar announcements daily.

Then followed a week-long barrage of TV and radio programmes with phone-ins, discussions,

5

MEDICINE

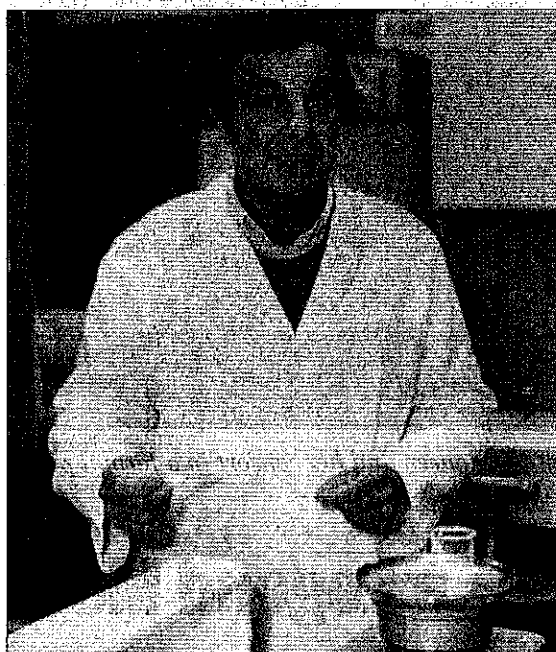
AIDS: The Search for a Vaccine

A French researcher serves as his own guinea pig

For the past three months, reports that a French researcher dared to test an AIDS vaccine on human volunteers in Zaire have stirred outrage among his fellow scientists. Did he pick one of the African nations most devastated by AIDS, they speculated, because he might be able to shortcut ethical guidelines on experiments there? Stung by the suspicions, Dr. Daniel Zagury of the Pierre and Marie Curie University broke his silence last week in a letter to the British journal *Nature*. He acknowledged that he had been testing an experimental AIDS vaccine and disclosed that he was the first to receive it. "I considered this to be the only ethical line of conduct," he told *Newsweek's* Ruth Marshall in Paris.

How to test a potential vaccine is one of the biggest stumbling blocks in AIDS research, because of the risk of infecting volunteers. So far, Zagury says, his "candidate" vaccine seems harmless—and possibly effective. Unlike vaccines made from a killed or weakened whole virus, such as the polio vaccine, his is an ingenious hybrid. It starts with a gene that produces part of a protein in the outside coat of the AIDS virus. Using recombinant DNA technology, the gene is inserted into the vaccinia virus, a "stable" organism long used in smallpox vaccinations. With the vaccinia virus acting as the carrier, Zagury hoped the protein would stimulate immunity against the virus. Last November he gave himself 10 million units through scratch wounds on the skin of his arm.

Different strains: He suffered no headaches, fever, chills or enlarged lymph nodes immediately after the vaccination, the first good sign. In 30 days, laboratory studies showed that his blood serum was "highly positive" for antibodies against one major strain of the AIDS virus. After 63 days Zagury found that the number of virus-attacking white blood cells had also risen. While the antibodies might protect against one specific AIDS virus type, the elevated white cells signified a broader immunity, suggesting that the vaccine could act against more than one strain of AIDS. That's a significant trait, given the virus's ability to mutate—and potentially foil a vaccine. Zagury acknowledged giving the vaccine to a "small number" of healthy Zaire volunteers as well. He has since administered booster shots to enhance immunity. No one, however, was deliberate-



J. PAVLOVSKY—SYGMA



JOHN TROHA—BLACK STAR

Scientists caught in a cross fire: Zagury (top), Gallo

ly exposed to AIDS to test the vaccine.

In his letter, the French researcher also alluded to an innovative treatment he has tried on two AIDS victims in Zaire. White blood cells from each of the patients were exposed to the AIDS virus in a test tube, then reinjected into the volunteers. Presumably, the treated white cells would activate others and stimulate a renewed immune response. Zagury told interviewers that both volunteers seem well and able to work, but he emphasized that he was not claiming a cure. He said he would describe the full results "in due course" and added

that all of his research had the "full support of the Zairian Ethics Committee."

Some of the criticism leveled at Zagury may reflect the institutional rivalries that have poisoned AIDS research from the start. Robert C. Gallo of the U.S. National Cancer Institute and Luc Montagnier of France's Pasteur Institute are still wran-

gling over who should get credit for the blood test to detect antibodies to the AIDS virus. Zagury is a close friend and collaborator of Gallo's—his son works in the NCI virologist's lab. The level of hostility could explain why one expert with links to Pasteur calls him "unstable" and "unpleasant." Meanwhile, sources close to Zagury blame the first leaks about his Zaire experiments on former staffers of the U.S. Centers for Disease Control, which has engaged in a rivalry with NCI over AIDS funding.

Why did Zagury choose Zaire for his human experiments? He was born in Morocco and, friends say, has always been concerned with African affairs. Reportedly, Zairian officials enlisted his help. He was offered the chance to participate in the existing CDC project there, but chose to work independently with local doctors.

More trials: Allan Goldstein of George Washington University Medical Center said Zagury "should be applauded for his courage in moving ahead in a very difficult area." Goldstein is working on an AIDS vaccine, called HGP-30, which some researchers consider as promising as Zagury's. He has asked the U.S. Food and Drug Administration for permission to test it in humans and hopes to begin by the end of this month.

Other teams around the world are also developing AIDS vaccines. The FDA is meeting this week to hear progress re-

ports. Last week the agency approved prescription sales of AZT, which has been shown to alleviate AIDS symptoms in some patients. But a long road lies ahead in the search for a preventative or a cure. A vaccine that shows promise in small trials like Zagury's might have to be given to as many as 20,000 uninfected volunteers before it is proven effective. Clinical trials could begin by the end of the year. But even the most optimistic experts think it will be at least five years before a vaccine can be perfected.

MATT CLARK with RUTH MARSHALL in Paris and MARY HAGER in Washington