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Cancer

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These four photographs show a cancer cell invading a healthy part of a body. What exactly are the risks everyone faces from



It is the second biggest cause of death in Britain, yet to scientists it is still a mystery. Why do cancer cells travel through the body? Is cancer caused by a virus? When an answer comes to either question it could bring the great breakthrough towards a certain cure. To throw light on a subject of importance to everyone in this country, Weekend Telegraph reports on the progress in the fight against cancer and talks to one man who found, at the age of 29, that he had the disease, but is now cured



DR F. ROE, of the Chester Beatty Institute, believes that "more emphasis on specialised training and facilities for early diagnosis should be combined with research"



RESEARCH CHIEF at the Imperial Cancer Research Fund, Dr G. Marrian, is convinced cancer will be beaten within 20 years by a series of small advances rather than a big breakthrough. "One of the major problems," he says, "is lack of ideas-sound ideas"



RESEARCH WORKER E. S. Klucis, in charge of the Chester Beatty Institute's \pounds 14,000 centrifuge machine, holds a rotor valued at \pounds 1,500. The high cost of equipment accounts for a large portion of the \pounds 3 million spent annually on research in Britain **WER** 100,000 people died of cancer in Britain last year. The number has been rising steadily as deaths from other causes have decreased, until now it is second only to heart disease as a national killer. What are the prospects of a complete cure for cancer being found? How fatal a disease is cancer today?

The first point doctors make about cancer is that it is not one disease but the name for a collection of diseases, some fatal, some not. Skin cancer, for example, is not so serious and can usually be cured without difficulty. Lung cancer, on the other hand, is survived by only a few.

The incidence of different cancers varies according to countries. It is partly because of the size and variety of the disease that President de Gaulle's proposal for a massive international research institute has not been supported. What type of research would it do? The Belgians might want research into lung cancer, Australians on skin cancer – which is sometimes the result of strong sunshine, and therefore much less important to the British. The scope for disagreement would be enormous.

Cancer research always seems to be on the verge of a breakthrough that never really comes. In the last 20 years, the most important single step has probably been the discovery of the apparent link between lung cancer and smoking. The main methods of treating cancer – surgery and radiotherapy – are over 50 years old; and the now-popular theory that cancer is sometimes due to a virus was first put forward about 1910.

Scientists generally accept now that a cancer cell is one in which the normal suppressing mechanism is absent—in other words, it is a cell lacking one of its proper constituents, not as had once been thought a cell with something extra. But even this "deletion hypothesis" is over 20 years old. No one yet knows why cancer cells sometimes invade other parts of the body—and this is what makes cancer deadly.

However, the treatment of cancer can often be improved without the nature of the disease being understood.

Surgery is the oldest method of treatment and, in many cases, it is still the best. A surgeon may effect a complete cure for breast, uterine cervical and intestinal cancers.

Radiotherapy involves bombarding the malignant cells of a cancer with X-rays. A heavy dose of radiation kills cells—good ones as well as bad. The problem for the radiotherapist, therefore, has been one of medical engineering, of locating the exact size, position and shape of the tumour. Once that has been done a beam of lethal radiation can be focussed on the spot. Improvements in location and measurements have made radiotherapy much more effective. Some cancer can be cured by radiotherapy, but in many cases it only holds the disease at bay and the patient has to return for treatment as malignant cells that have not been killed multiply.

Drugs for treating cancer are a relatively new development. They date from the 1940s. At present, no drug "cures" cancer, but certain

types of the disease can be held up by them and the pain can be relieved. What is the chance of cure today? It depends on the type of cancer and when it is detected. One statistic quoted is that one in three cancer cases is curable. But this covers types of the disease ranging from lung cancer-which is survived by only three per cent.- to breast cancer which is much easier to cure. Just as important as improving the treatment of cancer is the need to improve detection. It is early detection, more than anything else, that can cut the number of cancer deaths sharply.

For some cancers, techniques for detection are advanced. Cancer of the uterine cervix, for example, can be detected before it reaches a danger point by simple smear tests. Many health authorities in Britain offer this service to women, but as yet the service is poor because of the shortage of trained workers - in short, money is the problem.

It is said that the examination of every woman every two or three years should detect this type of cancer in time. Death from cervical cancer can literally be bought off if the nation has a mind to do it.

Detection of other types of cancer can be more complicated and tiresome. When, as in Britain, the medical services are ill-organised and over-worked a lot of cancer which could be diagnosed remains undetected until too late. Lack of GPs' time for proper examination is one of the problems. Another was described by a London doctor:

"Suppose a GP has a partially disabled old-age pensioner who has a complaint which just might be cancer. If he sends him or her to be seen by a specialist, it may mean an arduous journey to the other side of London. Many hospitals have bad appointments systems and the old person, after leaving home at the crack of dawn, may be kept waiting in grim surroundings most of the day only to be told that he will have to come back tomorrow. When the patient's complaint has only a five per cent. chance of being cancer, many a GP is going to hesitate about putting an old person to all that trouble.'

In the United States, cancer detection is much more streamlined than in Britain. General check-ups are more common, too. These all help to keep down the cancer deaths. Early detection, as the doctors stress again and again is the most important thing.

What causes cancer? The number of carcinogens-substances which have been shown in laboratory experiments to cause cancer -- is very large. But what amounts to a dangerous dose of various carcinogens is often disputed. Sometimes it seems clear that a particular substance causes cancer even though the laboratory tests are negative. This is so in the case of arsenical compounds. In other substances, environment seems to be the cause. The Japanese have a low breast cancer rate, though the reason is not known.

One of the most fruitful lines of research is into the habits and environment of cancer sufferers. Cancer of the uterine cervix, for example, varies greatly in different social groups. At the top of the social scale, the risk seems about half as much as for those at the bottom of the social scale. Personal hygiene, concluded the investigators, has a lot to do with it. This seems to be borne out by another survey in New York. It showed that this same cancer had an incidence among Puerto Rican immigrants 20 times higher than among Jewish women. This difference was ascribed to the sexual hygiene practised by Jews.

Nationalities show marked differences in their susceptibility to cancer. In the United States, it has been found that cancer of the oesophagus is substantially higher in all foreign-born white males than in native white Americans. Polish, Czech and Irish immigrants show the highest rate.

Explaining this has not been easy. But in the Irish case the trouble is ascribed to a high consumption of alcohol – indeed, the cancer rate among the-Irish seems to match closely that of liquor trade workers.

British immigrants to the USA show a higher tendency to lung cancer than natives. Atmospheric pollution here may be the reason.

For the scientist, these findings may suggest new lines of research. The cancer-tobacco link has certainly done so. The findings can also suggest what one needs to avoid-heavy cigarette smoking being the

most obvious. Certain foods and certain types of cooking may one day be shown to be dangerous.

One scientist has calculated, by lumping all environmental causes of cancer together, that 70 per cent. of cancer is "avoidable". Whether it is practically avoidable is another matter. Are people prepared to go to the trouble and expense of reducing cancer risks. How determined, forexample, is the country to get rid of atmospheric pollution? Not very, to judge by progress so far.

Research into cancer eats up a huge amount of money. Britain alone spends over £3 million a year. The United States spends vastly more. Every year the sums go up. The number of national and international cancer conferences where scientists share their findings is also going up. Always the assurance is that one day cancer will be beaten.

Most important of all basic discoveries would be the structure of the cancer cell. Biologists might track that down in the next decade. In the field of treatment, few things would be more important than finding how much cancer is virus-born, and isolating the virus. Then it is just possible that the scientists will be able to provide the world with an anti-cancer vaccine. ANDREW ALEXANDER



1. Sequence, filmed at four-second intervals through a microscope, shows how cancer cells (white) move over the normal cells (blue)



2. As body cells age, they are normally replaced by new, healthy cells. When cancer is present, the cell-control system breaks down



3. Once cancer cells are in the body, they can multiply rapidly, and their ability to "invade" normal cells around them increases



4: In final shot, altered positions and shape of the cancer cells can be clearly seen as they gradually invade normal body tissue

'Pain-it teaches you patience'

N 1957 Hedley Hawkins, a laboratory technician aged 29, had been married for five childless years when his local doctor sent both him and his wife Joyce for a check-up. The Harley Street specialist who saw Mr Hawkins passed him on to St Paul's Hospital for an X-ray.

"That was on the Wednesday – January 31. On the Thursday I saw the doctor there. He said: 'I'd like you to come in today for an operation.' I said that was impossible, as I had a car load of frogs and mice to deliver. I came in the next day and was operated on that afternoon. They told me they were removing a gland.

"I woke up on Saturday, feeling pretty sore. They put screens round me and the doctor said: 'We've had to remove two glands. We removed one and found a tumour on the other one so we took that out as well.' 'I'm in the field of biology,' I said. 'Tell me the truth. Was it cancer?' He looked at me and said: 'Yes I'm afraid it was.' I was shattered."

For three months Mr Hawkins went for daily deep X-ray treatment to the Royal Marsden Hospital, Fulham Road. After one month convalescence at Lancing, Sussex, he went home. He was told that he couldn't have children. "It was heart-breaking. So we decided to adopt. We went to adoption societies but they all asked if I had suffered from any serious illness. I couldn't deny it. Finally I was asked instead: 'Is there any health reason why you shouldn't adopt children?' The hospital backed me up and we adopted Christopher." Christopher is now eight and the Hawkins have two other children—Gillian, five, and Stephen, three.

"I found out when I had the treatment that the success rate was 30 per cent. I thought maybe I'm one of the other 70. I got to thinking, perhaps I'm not for this world. What had I done in life that was worth-while?" Mr Hawkins dates the beginnings of his Christian belief from that moment.

"I started searching. Why had this happened to me? Six months later I was listening to a preacher and it all fitted into place. It was like a flash of light. I saw the utter reality of the will of God in my life. Death isn't important. It's what you do with your life that matters. I now have a very sure belief in an afterlife. Before, I didn't think about it much."

Mr Hawkins is 38 now and lives in a new house in Knockholt, near Westerham, in Kent. He is the area supervisor for an animal nutrition firm. His wife, a nursing sister, stays at home to look after the children. In his spare time Mr Hawkins rears pigs.

He is also superintendent of the local Sunday school and helps with the church youth group.

"Look at the world. There are hundreds of thousands of people needing guidance." He fits his work on intensive farming into the same framework. "The world is partially starving and if you can get a bullock to size in one year instead of two or three, then you've done a good thing."

His illness made life difficult for him in several ways. "I got to thinking: if I die, what happens to my wife?" It was only after eight years of good health that he was able to take out life assurance. In 1959 he decided to change his work. "Three times I was offered jobs. Then a letter would come: 'We've had to change our decision owing to difficulties over superannuation' provisions' or something similar." Finally Nitrovit Ltd, the firm he now works for, took him on as a salesman.

"Cancer's a dirty word, like TB was 20 or 30 years ago," Mr Hawkins said. "So many people think of it as something black and horrible growing inside you. But it's not, it's just normal cells growing abnormally."

The tell-tale signs

OW does one detect cancer? The Cancer Information Centre, whose offices are at 296 Newport Road, Cardiff, advises that the best safeguard is an annual check-up by a doctor, plus an immediate examination if any of the following "seven danger signs" appears: 1. Any sore which does not heal;

2. A lump or thickening in the breast or elsewhere;

3. Unusual bleeding or discharge;

4. Change in a mole or wart;

5. Persistent indigestion or difficulty in swallowing;

6. Persistent hoarseness or cough;

7. Any persistent change in normal bowel or bladder habits.

Of course, if you notice any of these symptoms it does not necessarily mean you have cancer. They could have a much less serious cause.

Cancers themselves contain no nerves and are not intrinsically painful, but they cause pain by invading surrounding tissues which do contain nerve fibres, or by interfering with vital functions, e.g. causing intestinal obstruction and colic.

A close friend died of eancer a year before Mr Hawkins went into hospital. "A week before he died he asked us if he was going to be all right. We didn't know what to say. Now I think that if a person has a Christian belief he should definitely be told: ignorance creates fear. But for some people it could be catastrophic, a person might be determined to die, not live. People worry about the long drawn-out pain of it. But pain is an educator. It teaches you patience, and that there are things that matter more than the human body."

It is now nine years since Mr Hawkins' illness. He still has hormone replacement treatment that will continue for the rest of his life, and a checkup once or twice a year.

"The children know that daddy goes back to hospital every now and then and has holes dug and pills put in. But they're too young to know what the illness was. Apart from going back to hospital I'm extraordinarily healthy-just an ordinary person." PETER GILLMAN

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EACH YEAR 25,000 people in Britain are cured of cancer. One of them was 38-year-old Hedley Hawkins, of Knockholt, Kent, who had two glands removed in 1957. "Apart from attending hospital for hormone treatment, I'm an extraordinarily healthy person," he says