TABLE III.—*Comparative Mortality Figures for Cancer of Stomach and Breast in 1921-49 in Aggregates of Rural Districts of North Wales and Parts of England (With Rates for All Rural Districts as Base)*

Rural Districts of	Stomach				Breast	
	Males		Females		Females	
	15-	65+	15-	65+	15-	65+
North Wales { 1921-39 ..	184	173	224	203	95	91
{ 1940-49 ..	177	165	210	173	97	95
{ 1921-49 ..	182	169	220	192	96	93
Cheshire and Lancashire, 1921-49	101	97	99	104	95	101
West Midlands, 1921-49 ..	89	89	86	89	105	106
South-east, 1921-49 ..	81	83	73	76	105	100
All England and Wales ..	100	100	100	100	100	100

county rates were around 20% below. By way of contrast, breast cancer mortality in the 29 years showed no important differences between these areas, that in North Wales being 5% below average, and that in the West Midlands 5% above.

Justification for Research into Environmental Factors

Suggestions have been made that doctors in Wales tend to certify cancer of the stomach as the cause of death whenever haematemesis or obscure gastric symptoms make it seem feasible, and often with insufficient justification. No evidence that such a practice is in fact more prevalent in Welsh than in English rural areas has been produced. The relative excess is smaller at ages over 65 than in mid-life; and no compensating deficiency can be found in the group of deaths attributed to those conditions likely to be mistaken for gastric cancer, such as peptic ulcer, cancer of the liver, pancreas, and colon, other diseases of the stomach, and pernicious anaemia. Inquiries from a first sample of 100 certifiers of deaths said to be due to stomach cancer in North Wales show that there was necropsy, biopsy, operation, or x-ray evidence for 50%, compared with 65% of 100 deaths so certified in rural districts of Cheshire and Lancashire, and about 60% in the large towns other than Liverpool. If half the cases in which the diagnosis is unsupported by any of these tests are rejected, the North Wales rates would be reduced by a quarter and the Cheshire-Lancashire rates by a sixth, correcting the ratio between them to 1.8 at ages under 65 and 1.6 at ages over 65.

These preliminary statistical tests justify the Cheshire and North Wales Branch of the British Empire Cancer Campaign in their belief that there exists a real phenomenon to be explained, and in their determination to investigate race and residence, work and workplace, soil, air, and water, food, drink, and every conceivable vehicle of carcinogenic substances, or co-carcinogenic irritants. With this line of approach the community of the research area seem to be very much in sympathy. It is something they can understand and welcome because it holds out some hope of prevention, which from the patients' standpoint would be so much better than cure by surgery or radiation, no matter how skilful or high-powered that may be.

Contribution of Medical Officers of Health to Environmental Studies

At the International Conference in London in 1928, organized by the British Empire Cancer Campaign, Sir George Buchanan gave an address on "Collective Public Effort in Dealing with Cancer," which after 25 years is still very pertinent to the discussion to-day. Speaking of municipal work, he said: "The principle to be followed . . . is to secure the closest possible common action between the municipal health department and the authorities of the general and poor-law hospitals, the university if there is one, the voluntary agencies which support social work, and especially the staffs of hospitals and the medical practitioners as well as the local work of the B.E.C.C. where it is in operation. It is no part of the programme that municipal direction should

be made prominent; it is enough for the health department if it can help. Where the medical officer of health is wanted to take the initiative he will do so; otherwise he is content to be one of the cogs on a useful working wheel. Personally, I may express the view that cancer research has much to gain through his instrumentality. . . ."

I would like to take this opportunity of expressing my profound appreciation of the way in which the medical officers of health of the region in which I am working are, together with their assistants, helping the British Empire Cancer Campaign in just that spirit.

Sir John Robertson, at that time medical officer of health of Birmingham, uttered at the same conference some words on which I will close. "Inquiry by the health authority into the facts surrounding each death from cancer has as much value from an educational point of view as it has from an aetiological." How true this is we are finding out in the study I have referred to; education of surgeons, physicians, radiologists, and health officers about the essential gravity of cancer as a community problem is proceeding as a result of the inquiries in progress, and later it may even penetrate to the university. Whether the scientific results we hope for materialize or not, by such education the community will benefit eventually.

CANCER AND THE COMMUNITY*

BY

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The control of cancer is a world problem and one of the big challenges of the present day. Its magnitude requires an all-out effort to reach a solution. With our present knowledge of the disease a great deal can be done to help, but we must not be satisfied until it is under complete control. The object of this paper is to indicate the effects of cancer on the community and the ways in which the latter can co-operate in the fight for its mastery.

Effects of Cancer on the Community

These are of such severity that the disease can be described as one of the greatest scourges of mankind.

World Mortality.—The death rate from cancer varies in different countries, and the figures shown in the Table were published by the World Health Organization in 1951.

Deaths from Cancer by Country per 100,000 Population

Country	Males	Females
United Kingdom (1950) ..	205.8	184.0
France (1950) ..	175.8	169.5
Northern Ireland (1951) ..	161.3	145.1
Netherlands (1951) ..	151.4	147.2
U.S.A. (1949) ..	141.1	136.4
Canada (1950) ..	129.7	123.1
Israel (1951) ..	85.5	105.5
Japan (1950) ..	80.1	74.9

National Mortality.—Reference to the Registrar-General's Statistical Review of England and Wales for 1950 showed that 87,274 persons died from neoplasms, as compared with 72,613 in 1940. During this decade the death rate has fallen considerably from acute infec-

*Read in opening a discussion in the Section of Preventive Medicine at the Annual Meeting of the British Medical Association, Cardiff, 1953.

tive and parasitic diseases, tuberculosis, rheumatism, and respiratory diseases as a result of early diagnosis and advances in treatment, in which antibiotics have played an important part. Workers in public health and preventive medicine have made a big contribution in these and other fields, but the cancer situation remains serious in that the number of deaths in this decade has risen by 14,661 and only cardiovascular disease has a higher national mortality. It is not without significance that the greatest number of deaths are caused by cancer of the alimentary tract, especially of the stomach and colon, and these are rising. If the two conveying tubes, the oesophagus and the rectum, are compared, deaths from cancer are nearly three times greater in the latter organ.

Family and Individual Problems.—About half the total deaths from cancer occur in persons between 45 and 65, when their family and business responsibilities are greatest. The large number of children who die annually from cancer and allied diseases should also be remembered. The development of cancer is one of the worst events that can overtake us, for it means either a major operation, a course of radiotherapy, or both, and subsequent rehabilitation may take a long time, with the necessary follow-up examinations at regular intervals. Life may be resumed with a colostomy or tracheostomy, and when the disease is more advanced plans must be made for a chronic illness with all its repercussions on the life of the family. These things are brought out in the report of the Joint National Survey Committee (1952), of which I was chairman.

The present situation regarding mortality and morbidity is serious, and everything possible must be done to rectify it.

Control of Cancer.—The joint endeavours of the clinical and laboratory workers which are applied to gain this final objective can be considered as a five-point programme. Every member of the community has a responsible part to play.

Research into Causation

Studies concerning animal cancer in the laboratories have brought to light a number of genetic, physical, and chemical factors which cause malignancy. They have also been identified with human cancer; for instance, in the development of certain occupational and industrial forms of the disease exogenous physical and chemical carcinogens are recognized. It is also possible that some spontaneous varieties of cancer may be caused by other unrecognized carcinogens, either exogenous or endogenous, for which a determined search is desirable. Clues might come from a careful scrutiny of the environment and habits of people of various nations, for it is known that the incidence of the disease varies with race, country, and economic status. A more rigorous search for carcinogenic substances should be made in the tissues of patients with various forms of cancer, and it must be remembered that their action may be additive.

There is scope for increasing the amount of clinical research in the wards and of study of carefully compiled clinical records of astute observers. Obvious advantages would be gained by drawing clinical and laboratory workers closer together so that they could discuss their problems and share ideas. It should not be overlooked that some of the fundamental facts in cancer research were contributed by clinicians; for example, our knowledge of chemical carcinogens was built upon the observation of Percivall Pott that cancer of the skin of the scrotum was common in chimney-sweeps. Fundamental planned research in the laboratories concerning the nature of the cancerous change in normal

cells is a long-term project, but in the meantime there are many other problems to tackle whose solution may throw considerable light on the subject.

Prevention of Cancer

The community must recognize that certain varieties of cancer are preventable if the appropriate action is taken. Were further research to reveal that common types of the disease are caused by exogenous carcinogens it would be possible to gain considerable control by their elimination alone.

Precancerous Lesions.—A number of these conditions are well recognized, and more precise information is required regarding their frequency in the community and the degree of increased risk which they entail. These facts would be taken into account in the assessment of the need for cancer-detection centres where precancerous lesions could be dealt with. The association of this work with the prevention of cancer is obvious, and a few examples will suffice. A benign tumour such as an adenoma of the colon or rectum, a papilloma of the urinary bladder, or a duct papilloma or fibro-adenoma of the breast is carefully removed. If a benign melanoma is in a position where it might be injured it should be excised. Patients with familial polyposis of the colon and rectum develop cancer at a relatively early age, and the affected part should be removed before this occurs. Cancer is likely to develop in the colon affected by long-standing ulcerative colitis, so total colectomy is being performed more often in these patients. The association of oral sepsis, syphilis, and leucoplakia with cancer of the mouth has been recognized for a long time, and the incidence of this form of the disease will diminish by their timely treatment.

Cancer and Industry.—Workers in certain industries are exposed to carcinogenic substances which affect the skin and other parts of the body. The effects of mineral oils and tar are well known, and more recently benzidine and β -naphthylamine, used for making dyestuffs, have proved to be dangerous chemicals. Prevention of cancer in these industrial workers includes the isolation and separation of carcinogenic substances from the materials used by them, thus giving a complete safeguard. In the meantime the provision of protective appliances for the skin, adequate washing accommodation, good ventilation of factories, and the formation of regulations for the guidance of workers are of obvious importance.

Lung Cancer and Cigarettes.—As a result of the careful work by Doll and Bradford Hill we can say that cigarette-smoking is a potentially dangerous pursuit, and before starting the habit people should weigh up the increased risk of developing lung cancer in middle and later life. More investigations are necessary to see whether a carcinogen can be isolated from cigarette tobacco.

Lung Cancer and Atmosphere Pollution.—The high death rate from respiratory diseases in residents of the industrial centres of the country has been recognized for many years, and was emphasized during the great fog of London in the winter of 1952. It has been suggested that the continuous exposure of persons to a carcinogen in the atmosphere such as benzpyrene lowers the resistance threshold of the lung to cancer in cigarette smokers. More work is required concerning local atmospheric pollution in the neighbourhood of gasworks and its effects on the respiratory system.

Early Diagnosis and Treatment

The best chance for a patient with cancer lies in early diagnosis and efficient treatment, and my experience proves that it can be cured in many patients. The community has a special responsibility to report to the doctor when any disturbance in health occurs lasting more than a few days. Conditions other than cancer may be the cause of this, and by timely treatment they can be rectified. Some may hesitate to go to the doctor because they fear cancer, so by

wise teaching we must help them to conquer it. Progress is being made in the treatment of cancer, and people can take courage and find new hope. The present methods available include surgery, radiotherapy, chemotherapy, and combinations of these treatments.

Surgery, helped by advances in anaesthesia and antibiotics, has been extended to a number of organs, and radical operations for cancer of the oropharynx and hypopharynx, oesophagus, and lung can now be performed with a great measure of safety. Other operations have become more radical, thus increasing the percentage of operability and survival rates; these include resection of the stomach, colon, and rectum. Radiotherapy, alone or combined with surgery, has made a valuable contribution, especially in cancer of the skin, breast, cervix uteri, and larynx. Radioactive isotopes are helpful in cancer of the bladder and thyroid. Much work is also being done in chemotherapy to find substances to control cancer. Oestrogens retard the growth of cancer of the prostate or inactivate it; when the disease is advanced and the patient has been treated by castration and oestrogens, adrenalectomy may help further. A number of women with cancer of the breast are helped by the withdrawal of oestrogens by oophorectomy or the administration of androgens. I have known several of these patients with advanced cancer live normally for a number of years without any pain.

Rehabilitation of the Patients after Treatment

Following treatment the general condition of patients is usually lowered together with the ability to work. Hospital treatment is unnecessary, but they are not fit enough to go home; this interval must be bridged by convalescent treatment. Homes are therefore necessary for them which are staffed by those who are trained for this special work. The treatment includes rebuilding the patient's nutritional state, correcting any blood deficiency, restoring muscle tone and development. A colostomy or tracheostomy may be present, and patients may require instruction in their management. Following laryngectomy or laryngo-pharyngectomy speech therapy is necessary. Other patients may have an amputation stump which requires attention, together with instruction concerning wearing an artificial limb. Patients must also have an opportunity to reorientate their general outlook, and this programme of treatment requires several weeks to complete.

Care of Patients with Persistent Cancer

At present this is a big problem, but it is hoped that it will diminish in the future as a result of earlier diagnosis and treatment. Many of these patients are nursed at home and much help is required for them and their relatives. This was shown in the national survey report, where a description is given of how this can be done. Special assistance is available from organizations such as the Marie Curie Memorial Foundation and the National Society for Cancer Relief. There are homes where many can be given all the care and treatment required; some can go temporarily so that the family can have a rest. The maintenance of the general health, the nutritional state, and the condition of the blood are important in improving the patient's resistance to the disease. Modern methods for the relief of pain, palliative radiotherapy, and chemotherapy have proved valuable in certain circumstances. These patients often face a long illness, so care is taken to avoid despondency; much can be done to help them, and no impression must ever be given that treatment has ceased.

Cancer Education for the Public

It is clear that the community has its responsibilities in this programme for cancer control, chiefly in connexion with the prevention and early diagnosis of the disease. Before people can play their part they must be advised about

the steps they can take under certain conditions in a way which will gain their confidence.

In 1804 an attempt was made to give people information on this subject, but the mails were so slow that the patients died before it reached them. Since that time a number of surgeons have stressed the need for this work. For example, in 1900, when Wertheim introduced his operation for radical removal of the uterus, a movement was started in Germany to educate women to recognize the early symptoms of cancer of the cervix uteri. The Marie Curie Memorial Foundation has a plan to carry out cancer education on a national scale. The object is to substitute intelligence and optimism for ignorance and fear. It is not enough to tell people what are the early symptoms of cancer; they should also be told how to act in certain circumstances and what can be done to help them. It is recognized that this must be done wisely and by stages until the whole population is eventually covered. An important approach to the public is through the medical officers of health, and already a number have set up education committees to deal with the work. These committees should be expanded to cover the country, and in the first place information given to specified groups, including the district nurses, who number 13,000 in England and Scotland; health visitors, numbering about 6,000; and student nurses, numbering 50,000. The education scheme should also embrace all the social and welfare workers, and by this means a nucleus of informed people will be created through whom the facts can reach the population. Expansion will occur by degrees by taking in other sections until the whole country is covered.

Methods of Teaching

Use of Leaflets.—A series of 12 leaflets setting out the early symptoms of cancer in the chief sites of the body, together with notes on its prevention and treatment, is available at the Marie Curie Memorial Foundation to medical officers of health and others on request for careful distribution.

Lectures and Films.—Groups of people are invited to lectures on cancer which are illustrated by lantern slides, and educational films are shown. Experience shows that these are well attended, and excellent discussions follow the lectures. Special lectures are also given to members of the nursing profession in refresher courses, and, in addition, arrangements are made for groups of district nurses to attend at a cancer clinic so that they can see the results of modern diagnosis and treatment. Talks on the radio can also be developed, and these will reach a large section of the community.

Publications.—Periodically, articles on various aspects of cancer are published for nurses and health visitors to help them in their work. In addition, simple articles published in the lay press are of value to the public.

Presentation.—The subject must be presented in simple language which is easily understood and designed to develop an optimistic outlook and confidence. A complete picture is given, including information on the nature of the disease, the way by which it may be prevented, the early symptoms and signs, and what can be done for the patients. The latter includes the help which is available from the various organizations working in this field.

Summary

The effects of cancer on the community are described with special reference to world and national mortality, together with family and individual problems. It is shown that the present situation is serious as regards mortality and morbidity. A five-point programme for the control of cancer is described and the part the community can play is shown. An outline of a scheme for cancer education of the public is given.