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Urban District of Lakes

ANNUAL REPORT

OF THE

Medical Officer of Health

FOR THE YEAR

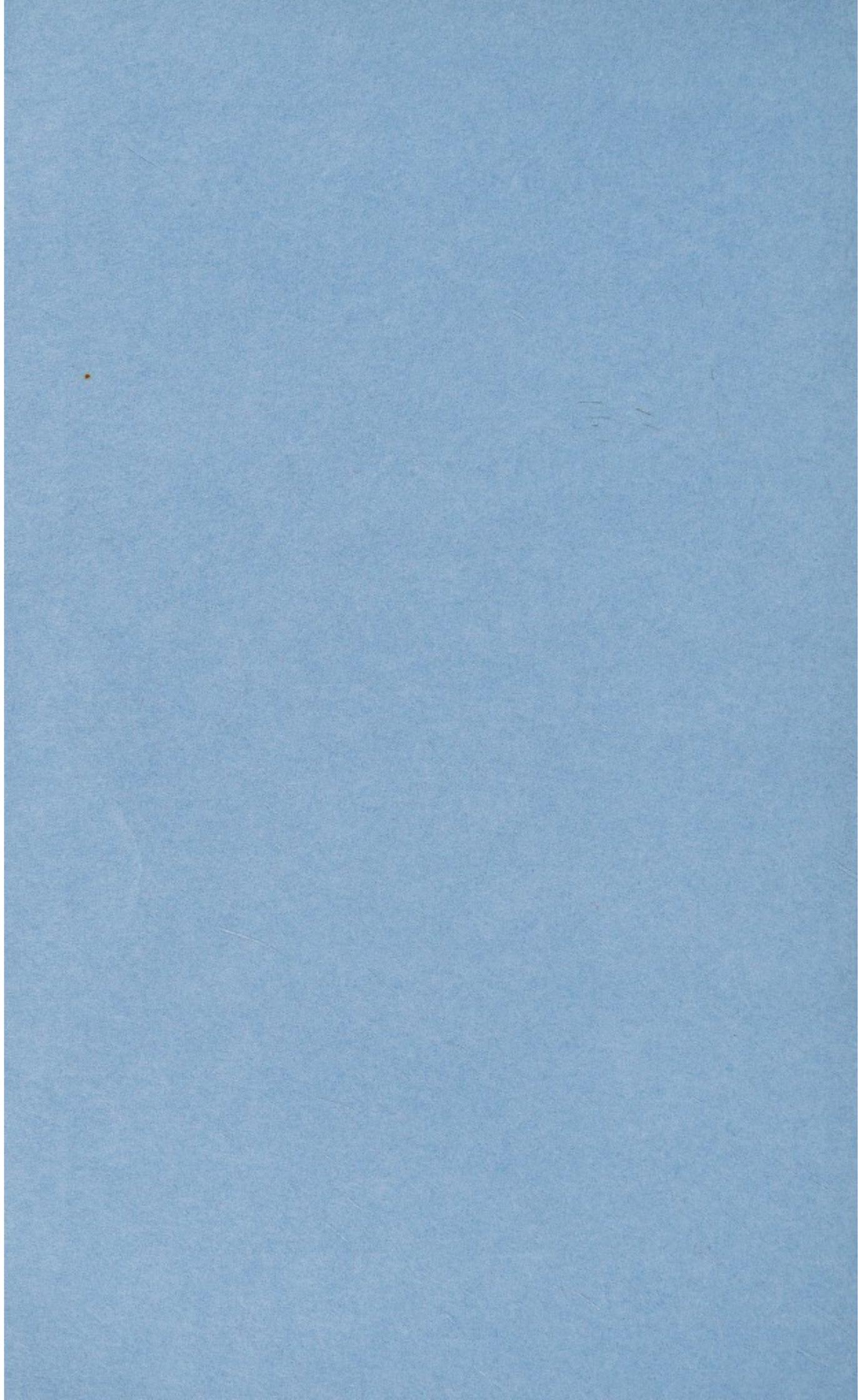
1963



KENDAL

TITUS WILSON & SON, LTD.

1964



NATURAL AND SOCIAL CONDITIONS OF THE DISTRICT.

Urban District of Lakes

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Kendal 1296.

Stricklandgate House,
P.O. Box 18,
Kendal.

To the Chairman and Members of the Urban District Council of Lakes.

SIR, LADIES AND GENTLEMEN,

I have the honour to submit to you my Annual Report on the health of the Urban District for the year 1963.

I wish to acknowledge the help and ready co-operation of my colleague the County Medical Officer of Health, and also the assistance afforded to me by the local general medical practitioners.

I am indebted also to the Public Health Inspector and his staff for the spirit of teamwork which exists in my department, and for the fund of local knowledge which they have laid at my disposal.

I have the honour to be,

Sir, Ladies and Gentlemen,

Your obedient servant,

FRANK T. MADGE,

Medical Officer of Health.

NATURAL AND SOCIAL CONDITIONS OF THE DISTRICT.

Area of the Urban District in acres	...	...	...	...	49,917
Population at 1961 Census	...	...	...	...	6,061
Population (Registrar-General's mid year estimate)					5,510
Inhabited houses	...	...	...	...	1,926
Rateable Value	...	...	...	...	£204,474
Product of a Penny Rate	...	...	...	...	£813
Rate in the Pound levied	...	...	...	...	10/0d.
of which the County Rate was	...	...	...	...	6/11d.

The Urban District of Lakes lies in the heart of the English Lake District and is the nucleus of the National Park. About three miles of the north-eastern shore of Windermere Lake is within the District and the inhabited areas are sited along three main valley systems which radiate from the Lake. To the west lie the Langdales, to the north the dales of Rydal and Grasmere, and to the north-east the Troutbeck Valley which leads over the Kirkstone Pass to the geographically detached dalehead of Patterdale and Glenridding at the head of Ullswater Lake. Your Council Offices are situated at Ambleside.

The valley bottoms lie between 150 and 300 feet above sea level in the major western portion, and in the Patterdale area at about 500 feet. The massive crags and fells rise steeply to altitudes of between two and three thousand feet, comprising some of the finest mountain scenery in Great Britain. Some of the valleys are wooded but the fellsides are majestically covered only by brackens and heather. The stone-built houses are scattered irregularly along the valleys, with only two large villages or townships of any size, Ambleside and Grasmere. The District is therefore essentially rural in character. These geographical features determine the natural lines of communication and therefore influence the spread of infectious diseases.

The geology of the District is almost entirely confined to the Borrowdale Volcanic Series of lavas, tuffs and agglomerates with some igneous intrusions. The lavas are mainly andesites with rhyolites at various horizons. The fragmentary rocks resulting from explosive eruptions vary from fine-grained tuffs and ashes to coarse agglomerates and breccias. Lateral pressure has converted some of the tuffs into slates suitable for roofing. In the extreme south of the District the thin bands of the Coniston limestone and Ashgillian series are interposed between the Borrowdale series and the commencement of the Silurian Rocks which stretch away to the south of the County. Workable deposits of non-ferrous metals, particularly lead, are found in the

north-eastern part of the District. These geological characteristics are of great significance in the supervision of water supplies, sewerage and occupational diseases as well as affecting the economics of the District.

The climate is mild and equable in the valleys, and invigorating on the fellsides and uplands. The dales of Rydal, Grasmere and Troutbeck are sheltered from the prevailing westerly winds, and, being open to the south, provide full access to sunshine. The Langdales are more exposed, and Patterdale, though sheltered, has a northerly aspect. Temperature gradient inversions are occasional in the spring and autumn but are soon dispelled in the mornings. The rainfall averages 70 inches a year, but this figure is due more to the heaviness of the rain when it occurs rather than to an undue proportion of rainy days. Snow may be expected for one or two weeks in the late winter.

The District is predominantly a holiday centre for climbing, walking and enjoying the scenery of mountains and lakes, and there is a large influx of seasonal visitors which raises the population to an estimated peak of approximately 8,000. This tourist trade has been imposed upon the basic characteristics of agriculture, mainly sheep-farming, and many of the small local industries are therefore ancillary to agriculture and the holiday trade. There are also slate quarries and knitwear making which provide a certain amount of local employment and stability to the District to help balance the fluctuating conditions of the seasonal trades.

Opportunities for local employment help to check the drift from the countryside. These industries together with the trade associated with the hotels and boarding-houses have provided a limited economic security and local prosperity which is a most important factor in the maintenance of public health.

STAFF.

Name.	Qualifications.	Office.	Whole or Part Time.	Other Offices.
Madge, F. T. . .	M.D., Ch.B., M.R.C.S., L.R.C.P., D.P.H.	Medical Officer of Health	Part	M.O.H. Combined County Districts of Westmorland
McAdam, J. H. . .	M.A.P.H.I., Cert. S.I.B.	Public Health Inspector	Part	Building Surveyor
Gray, M. . .	—	Clerk	Part	—
Machell, B. M. . .	—	Clerk to Medical Officer of Health	Part	Clerk to M.O.H. Combined County Districts of Westmorland

Staff Changes.

There were no staff changes during the year.

COMMITTEES.

The Minister of Health requires me to include a list of your Council's committees which are concerned with matters of public health.

The Health Committee deal with the principal matters, but there are other aspects of public health importance which are dealt with by the Highways and Housing Committees.

When the Lakes and Lune Water Board assumed responsibility for the public water supplies, the remaining functions of the Water Committee were transferred to the Health Committee, and possibly to certain other Committees as appropriate.

VITAL STATISTICS.

The following extracts are made from information supplied by the Registrar-General, with figures for 1961 for comparison.

Area of the District in acres	49,917
-------------------------------	-----	-----	-----	--------

	1962	1963
Estimated civilian population (mid year) ..	5,510	5,510
Live Births. Legitimate—		
males	25	32
females	32	20
Illegitimate—		
males	2	—
females	1	2
Total	60	54
Crude Rate per 1,000 population	10.9	9.8
Corrected Rate per 1,000 population	11.2	9.6
Birth Rate for England and Wales	18.0	18.2
Illegitimate Birth Rate per 1,000 live births.	50	37.03
Still Births. Legitimate—		
males	1	—
females	—	—
Illegitimate—		
males	—	—
females	—	—
Total	1	—
Total (live and still) births ..	61	54
Rate per 1,000 total (live and still) births	16.4	—
Rate for England and Wales ..	18.1	17.3

	1962	1963
Deaths. males	48	31
females	44	35
Total	92	66
Crude Rate per 1,000 population ..	15.7	12.0
Corrected Rate per 1,000 population	13.3	9.7
Rate for England and Wales ..	11.9	12.2
Infantile Deaths (under 1 year)		
Total deaths under 1 year.. ..	—	—
Rate per 1,000 live births	—	—
Rate for England and Wales ..	20.7	20.9
Legitimate	—	—
Rate per 1,000 legitimate live births	—	—
Illegitimate	—	—
Rate per 1,000 illegitimate live births	—	—
Neonatal Deaths (under 4 weeks)		
Total neonatal deaths	—	—
Rate per 1,000 live births	—	—
Rate for England and Wales ..	15.1	14.2
Early Neonatal Deaths (under 1 week):		
Total early neonatal deaths ..	—	—
Rate per 1,000 live births	—	—
Perinatal Mortality		
Stillbirths and deaths under		
1 week.. .. .	1	—
Rate per 1,000 total (live and		
still) births	16.4	—
Maternal Mortality:		
Total Deaths	—	—
Rate per 1,000 total (live and		
still) births	—	—
Rate for England and Wales ..	0.35	0.28

Deaths from certain causes:—	1962.	1963.
Cancer	17	12
Measles	Nil	Nil
Whooping Cough	Nil	Nil

The main causes of death were:—

Heart Disease	26
Cancer	12
Vascular lesions of nervous system	9

COMMENTARY ON THE VITAL STATISTICS.

Population.

The population at the 1961 Census numbered 6,061 persons, comprising 2,668 males and 3,393 females, a small decrease of 35 persons since the 1951 Census.

An analysis of the figures shows that in fact there was a natural decrease of 221 more deaths than births, but it was offset by a net immigration of 186 persons. The District relies heavily upon immigration to maintain the numbers in population, and these are usually people who come to live here on retirement.

This has caused us to have a much higher proportion of elderly people in our local community than in most other districts. The average percentage of people over 65 years of age in England and Wales was 11.9% at the 1961 Census, and the average for Westmorland was 14.9%, Lakes Urban District had 16.5%.

In more practical terms, out of our local population of 6,061 we had 998 people over 65 years old. 613 of them were women and only 385 were men. Most of them were widowed or single.

But in these days, the 65th birthday is becoming a derisory landmark for accepting the label of old age. Perhaps 75 might be more realistic for easing up on the rough and tumble of an active life. We had 365 people over 75 years old in our District: most of them still hale and hearty. 51 were over 85 years old, and 13 were over 90 years. Not bad going for our little population of some 6½ thousand souls.

Nevertheless it means that the younger age groups will have to keep awake to provide the community support which elderly people need to make their survival achievements worthwhile.

Turning to the housing statistics of the 1961 Census, it can be seen that in spite of the fact that our local population remained about the

same, the number of structurally separate houses increased by 220 during the ten years since 1951, and there are 1,140 more occupied rooms. Just how many of these extra houses are kept for occasional holiday use by outsiders is not known, but undoubtedly there has been a very great improvement in living conditions for our own folk.

A proper perspective cannot be obtained by considering merely one year's changes. It is the general trend of population which is important for the planning of your future housing, water and sewerage requirements, and for the broader issues of the economic prosperity of your District.

Death Rate.

Your death rate was below the national rate. It fluctuates either side from year to year, but it is never far from the national figure. I do not attach much significance to those variations. Heart disease and cancer take the biggest toll.

Birth Rate.

Your corrected birth rate is 9.6 per thousand of the population. For many years it has been deplorably low, a mere half to two-thirds of the national rate. If your native community is to survive you must raise your birth rate well above your death rate, and to do that you will have to recapture and hold the faith of your young people in country life.

Stillbirth Rate.

The stillbirth rate was statistically insignificant.

Perinatal Mortality.

There is often not much difference between the cause of a baby dying in the first week of its life and the cause of a stillbirth. Sometimes it is a matter of chance whether such a baby dies before delivery or after. So we now add the number of stillbirths to the number of babies dying in their first week, and we call it the perinatal mortality: in popular language, the deaths which happen around the time of birth. The more precise limits are between the beginning of the twenty-eighth week of pregnancy and the end of the fourth week after delivery.

Anyway, the perinatal mortality statistics include most of the fatalities which are caused by abnormalities of the baby as it develops in the womb. Some of those may be due to the mother catching infections during a critical phase in her pregnancy; or more rarely

to drugs: or more commonly to some genetic factor. The statistics include the fatalities which are caused by toxæmias of pregnancy and accidents within the womb. The mechanical stresses and strains of delivery, the attention given to the newborn child, the blood peculiarities, and even the risks of accident and infection in the first week of life, are all included factors. So the perinatal mortality rate is perhaps better regarded as a measure of obstetric achievement. What happens to a live baby in its first four weeks depends to a great extent on what has happened to it before delivery.

There are some signs of hope that science may be able to prevent certain types of developmental abnormalities, and it is clear that the increased availability of obstetrical specialists will help to reduce the number of neonatal deaths. An advisory obstetric committee has been set up in Westmorland to co-ordinate the functions of the three divisions of the health service involved in midwifery, and to investigate the causes of stillbirths and infant deaths. Its second Triennial Report was published during 1962.

PREVALENCE AND CONTROL OF INFECTIOUS AND OTHER DISEASES.

Public Health Act, 1936. Sections 143-170.

National Health Service Act, 1946. Part III.

The general incidence of illness can be assessed by the weekly number of new claims for sickness benefit at our local National Insurance offices. A logarithmic graph of those figures shows a regular seasonal pattern over the years, and any variations are usually worth investigating.

A small invasion of measles was the main feature of 1963. Occasional cases cropped up in scattered places during the first three-quarters of the year, and then flared up into a minor epidemic in Ambleside in October. None of them were serious.

It is pleasing to record that the notification of infectious diseases has much improved in recent years, and I am very grateful to my colleagues in general practice for their prompt help in this respect. I look upon the control of notifiable diseases as one of the most important duties of our department.

NOTIFIABLE DISEASES TABLE.

DISEASE	Total	Ages										Admitted to Hospital	Deaths			
		-1	1-	2-	3-	4-	5-	10-	15-	20-	35-			45-	65-	
Measles	38	3	3	7	4	9	7	4	-	-	-	1	-	-	1	-
Acute Pneumonia ..	3	-	-	-	-	-	-	-	2	-	-	-	1	-	-	-
TOTAL	41	3	3	7	4	9	7	4	2	2	-	1	1	1	1	-

Mountain Accidents.

Accidents on our mountains are a special hazard in this District. A regular toll of death and suffering happens every year. Most of these accidents are preventable, and they mostly affect our visitors.

The inexperienced, the unlucky, and the foolhardy, fall out of crags while rock-climbing, lose themselves in the dark and the mist and snow. The physically unfit die of exhaustion, exposure, and the heart attacks which catch up with them sooner than need be. The suicides make their last gesture to the emotional appeal of the mountains.

Someone has to turn out to look for them, and rescue them, and bury them. A magnificent local organisation of search and rescue teams has been built up in the District to meet these demands. But we wish that trade might not be so brisk.

A campaign for the prevention of mountain accidents has been organised not only in your District, but also back into the big towns from which our visitors come, and to a wider audience on radio and television. We hope it may help.

TUBERCULOSIS.

Tuberculosis is one of the most important communicable diseases of our time. Its prevention is primarily dependent upon social and economic factors in the general community, and secondarily upon the management of the established case. Your Council's functions are three-fold: to investigate the source of infection, to prevent the spread of infection, and to remove conditions favourable to infection.

TUBERCULOSIS TABLE.

Age Periods	NEW CASES				DEATHS			
	Respira- tory		Non-res- piratory		Respira- tory		Non-res- piratory	
	M	F	M	F	M	F	M	F
0 ..	—	—	—	—	—	—	—	—
1 ..	—	—	—	—	—	—	—	—
5 ..	—	—	—	—	—	—	—	—
15 ..	—	—	—	—	—	—	—	—
25 ..	—	—	1	—	—	—	—	—
35 ..	—	—	—	—	—	—	—	—
45 ..	—	—	—	—	—	—	—	—
55 ..	—	—	—	—	—	—	—	—
65 ..	1	—	—	—	1	—	—	—
Total ..	1	—	1	—	1	—	—	—

The number of tuberculous patients on the register at the year end were:—

	1962.	1963.
Respiratory ...	10	8
Non-Respiratory ...	—	3
	10	11

One of the most effective ways of finding the sources of infection is mass radiography. The Mobile Units of the Regional Hospital Boards visit our townships and villages periodically. I should like to see many more of our local population take advantage of this valuable service. It not only detects pulmonary tuberculosis at the most favourable time for a cure, but it also provides an early warning against many other chest conditions, lung cancer, and certain heart diseases.

Preventing the spread of infection is helped by prompt treatment and supervision. Waiting time is nowadays very short for admission to hospital, and modern drugs achieve most promising results for returning the patient to a useful working life.

It is equally important to discover the non-active cases of tuberculosis, so that we can do all in our power to prevent them breaking down in an infectious state. So, too, with cancer of the lung, in order to secure the best chance of operative treatment.

The x-ray results are communicated to the patients' family doctor if there are any abnormalities, and so the findings can best be explained to the individual if any treatment seems needed.

Such discoveries more than justify the visits of the Mass Radiography Units to our area at regular intervals. I think that we should do all we can to make really excellent arrangements for their reception to our townships and villages, and encourage our local people to turn up in full force for their chest x-rays.

The Hospital Services.

National Health Service Act, 1946. Part II.

The smaller northern part of your District lies in the area of the Newcastle Regional Hospital Board, and the general hospitals at Carlisle have traditionally served the needs of our Patterdale folk, and it seems likely that they will continue to do so.

The larger southern parts of your District lie in the area of the Manchester Regional Hospital Board, and most of the general needs of our local people have historically been met by the Westmorland County Hospital at Kendal. Some of the more specialised services have always had to be referred to more distant centres. That has always been understood and accepted by our local community.

But in recent years there have been signs that our local folk may be forced to rely more and more on Lancaster, and less on Kendal. Some people think that Westmorland risks being left rather ill served

if the hospital services concentrate themselves on distant Lancaster and Carlisle. There is a lot of territory in between, and public transport communications are not at all easy for out-patients and visiting relatives to get to those hospitals and home again the same day.

With the publication of the Government's Hospital Plan and the consequent press comment and political pressures, the Regional Hospital Boards became noticeably much more sensitive to public opinion. There are a lot of local questions to be settled: some have been answered for the time being: some are being argued out now: some will have to be soon.

For example, in 1961 we obtained the assurance from the Manchester Regional Hospital Board that Helme Chase should continue as a general practitioner maternity home, and that some obstetric consultant services should continue to be available in Westmorland. Public sentiment seemed to be particularly strong about preserving some maternity beds in a place where the local women wanted them.

Under very critical review at the present time is the Manchester Regional Hospital Board's policy for providing geriatric and chronic sick-beds in the Kendal neighbourhood. There are three main points at issue: the state of the present hospital buildings at Kendal Green, the total number of geriatric beds locally, and the long-term future provision of chronic sick and geriatric beds within the Borough of Kendal or its very close vicinity.

These hospital problems are just as much a matter of environmental public health for our own Local Authorities as they are administrative exercises for the Regional Hospital Boards. I believe that it does matter very deeply where our old folks are looked after when they fall ill: somewhere where they will go cheerfully, keep in touch with home: not just swept away out of sight. I believe that relatives and friends should easily be able to visit the hospital: to leave their homes running for the short time while they are out: not to spend hours and hours travelling on the scanty rural bus services and curtailed railways, coping with darkness and winter weather, weariness and worry.

So too, it behoves us to keep a watchful eye upon the future existence and functions of the Westmorland County Hospital, and the services which we can obtain there; and upon Meathop Hospital and the Ethel Hedley Hospital. We cannot afford to sleep in at a time when radical changes are being discussed out of earshot across our borders. I believe that Westmorland deserves a lot of extra thought and care in planning the hospital services: and it seems worthwhile going on saying so.

Hospital and Ambulance Arrangements for Infectious Diseases.

National Health Service Act, 1946. Parts II and III.

Hospital accommodation for infectious diseases is provided by the Manchester and Newcastle Regional Hospital Boards at Lancaster and Carlisle. Smallpox cases will be admitted to the Ainsworth Smallpox Hospital near Bury.

Ambulance transport for cases of infectious disease is provided by the Westmorland County Council.

Disinfection Arrangements.

Disinfection facilities for clothing and bedding are not very satisfactory owing to the lack of a steam disinfecter. Reliance is therefore placed usually upon disinfection with formaldehyde in the patient's house. Disinfection of premises and other chattels is carried out locally and presents no special problems.

HOUSING.

Housing Acts.

Under the Housing Acts your Council has a duty to consider the general housing conditions in your District, to ascertain whether any are unfit for human habitation, and to assess the need for further houses. You have powers to deal with unfit houses, powers to provide new houses for all classes, and various powers and duties in the management of your Council's housing estates. Good housing conditions are an integral part of public health.

Present Housing Position.

Housing Act, 1957.

There are 1,926 inhabited houses in your District. With an estimated population of 5,510 the average number of persons per house is 2.8. This figure is purely hypothetical since many of the better houses have only one or two occupants, and a number of the smaller houses are occupied or let furnished only in holiday times by absentee landlords.

It is probable that the dalesmen's houses have an average of at least four persons per house, which is not excessive for a normal-sized family, and there is probably little overcrowding within the strict definition of the Housing Act. It is temporarily increased during the peak of the holiday season, but no certificates under Section 80 of the Housing Act, 1957, have been granted by your Council to authorise exceeding the permitted numbers.

General Progress of Slum Clearance and Improvements.

Westmorland as a whole has made very encouraging progress in post-war slum clearance despite all the difficulties of the times. Since the campaign was resumed in 1948 well over 1,000 houses in the County have been dealt with by formal action under the Housing Acts. Most of these will eventually be demolished or converted to trade use, but many of them have been reprieved by their owners undertaking to spend considerable money for comprehensive reconditioning up to modern standards. In addition to those formal actions there have been a very creditable number of informal schemes for the renovation of sub-standard houses, either with the aid of improvement grants or entirely by private enterprise. The aim is to save a house wherever possible, but if it cannot be brought up to an acceptable standard of safety, decency and amenity the sooner it is swept away the better.

The Housing Act offers financial grants to owners to recondition existing houses in a comprehensive manner, and I hope that owners of Class 4 and 5 houses will consider the possibilities of each house with a view to maintaining the architectural traditions of the District and making decent houses for our dalesfolk.

The Housing Repairs and Rents Act, 1954, required your Council to declare their proposals for dealing with substandard houses. You resolved to deal with the estimated 87 unfit houses within ten years. The Minister of Housing and Local Government approved the proposals, and they are now on deposit for public inspection.

We were able to make good progress with the worst of the 87 unfit houses in the programme, so that when the Minister called for a review at half-time in 1960 we reckoned that only about 41 houses remained for action of some sort. The figures were steadily being whittled down by informal reconditioning.

The Minister urged us to condemn the outstanding 41 unfit houses in a shorter period than five years, but we were able to convince him that we experience an unusually high proportion of reconditioning old stone cottages in our National Park, albeit at unreasonable expense, and that we feel it desirable to preserve the architectural features and grouping of our Lakeland villages, hamlets and farm-houses. We have tried to foster such preservation without too much doctrinaire destructive pressure under slum clearance programmes.

At the end of 1963 we calculated that there were only about 26 houses outstanding on the programme list, and I really do not expect to have to take formal condemnation action against all of them. Proposals for reconditioning old cottages keep coming in even faster, and the whole programme is very fluid. We shall have to get a clearer

picture nearer the completion date, 31st December, 1965, and at this present stage I can do no more but say that our restrained and patient policy seems to be paying off, better than if we had rushed around with bulldozers.

Perhaps a clearer way of illustrating our progress with slum clearance can be shown by disregarding the rather artificial divisions of the Statutory Programme, and thinking of our whole post-war task, and see how far we have got with it. We reckoned it as a total of 133 substandard houses, and a Balance Sheet of progress is set out on an adjacent page.

I regard that as a very creditable achievement, and we are now in process of examining how best to deal with the outstanding task. The following paragraphs analyse the actions taken during the current year, and are mainly for record purposes.

Closing Orders.

Housing Act, 1957. Section 18.

No closing order was made during the year, 5 such orders are on the register of local land charges. 3 of these houses are still occupied.

Undertakings not to use for Human Habitation.

Housing Act, 1957. Section 16.

Two undertakings not to use a house for human habitation were accepted during the year, leaving 27 such undertakings on the Register of Local Land Charges at the year end. 3 of such houses are still occupied.

Undertakings to Repair.

Housing Act, 1957. Section 16.

No formal undertakings to execute works of repair were accepted during the year. 3 such undertakings remained on the Register of Local Land Charges at the year end.

Improvement Grants.

House Purchase and Housing Act, 1959.

Discretionary improvement grants were approved during the year for 5 houses.

Standard grants during the same year numbered 15.

Demolition Orders.

Housing Act, 1957. Section 17.

No demolition orders were made during the year.

There were no demolition orders outstanding on the Register of Local Land Charges at the year end.

LAKES URBAN DISTRICT.
Slum Clearance Position at 31st December, 1963.

SLUM CLEARANCE TASK.	SLUM CLEARANCE PROGRESS.
Slum Clearance actions uncompleted from prewar 0	Action completed by demolition or conversion to other approved use or made fit on recondition 60
Rural Housing Survey, 1945— Class 5 houses 91	Vacant and awaiting demolition 2
Houses which deteriorated into unfitness since the 1945 Rural Housing Survey and the Housing Repairs and Rents Act, 1954 42	Waiting rehousing from occupied condemned houses 8
	Houses made fit or otherwise dealt with by informal action 35
	Reassessed as fit under Section 4 2
	Not yet dealt with 26
—	—
133	133

Clearance Areas.

Housing Act, 1957. Section 44.

Five out of the six cottages at Township, Patterdale were cleared during 1956 and made room for a much needed road widening on a bad corner. The remaining cottage is well out of the way, but it is still occupied by the original tenant who was there when the clearance order was made by the West Ward Council some quarter of a century ago. A monument to independence of the spirit.

Three old houses in a very congested part of Pinfold Row, Ambleside, were made subject to a Clearance Order during 1957. After a public inquiry the Minister of Housing and Local Government confirmed the Order. Although a start was made with demolition in 1961, it was not fully completed. The remnants are of course unoccupied.

Estimated Requirements for New Houses.

Housing Act, 1957. Section 91.

Your District is perhaps one of the most difficult areas in the whole country to assess for its new housing needs. It is subjected to so many outside pressures and influences, often operating far behind the scenes. On one hand there is a noticeable planning resistance to much new housing development in the remaining open areas of the National Park, and on the other hand there is the steady take-over of our traditional dalesfolks' homes to make holiday cottages for outsiders with more money to spend on them.

It is a quietly fought battle, sometimes grimly contested, and often with very mixed issues. Those of the younger generation who have resisted the call or the push to emigrate are not content to settle down to a primitive way of life in the ancient family cottage. If they stay in Lakeland they claim the decencies and comforts of modern living. They could not afford to modernise the old places even if they wanted to. Some of the offcomers who retired here have found it hard to adapt themselves to rural cottage life. Perhaps the outside economic pressures operate for the greater good after all. Certainly the financial blood transfusions from beyond our borders have saved many picturesque ancient cottages from destruction as well as stimulating local trade. But the whole situation complicates assessment of your new housing needs.

What we do know for a fact is that there were 168 applicants on your waiting list for Council houses during the year. 57 of those families were without a separate home of their own, and 111 families

wished to exchange their old houses for a Council one, or to live in this area.

Some of those people who wish to be rehoused are living in condemned property or cottages which are on the list for condemnation. Your Council have recently made a determined effort to clear the condemned premises, and at the year end there was only one such family awaiting the move. We reckon that about 20 other families still live in cottages which are condemnable, and where the cost of reconditioning is not economically attractive to their present landlords with sitting tenants in occupation. No doubt many of those little houses will eventually be saved by outside purchasers willing to recondition them for owner occupation or holiday lettings.

Some of the families in the condemnable houses have not yet put themselves on your formal waiting-lists, and there are some other people, now residing outside the area, who would like to live nearer their work within the District, or just live there anyway. Perhaps the need is not quite the same thing as the demand.

But however many houses you decide to build, I trust that you will bear in mind the specialised needs of the high proportion of elderly people in your District. The younger folk have had a fair deal with the building of family houses, and the time is nigh for the purpose-built house to meet the modest needs of older people.

House Building Progress.

Since the end of the 1939-45 War and up to 31st December, 1963, your Council completed 142 houses.

During the same post-War period 72 houses were completed by private enterprise, 11 during the current year.

The selection of centrally placed sites I feel will be particularly important for old people who need some community help in the time of their difficulties, but who enjoy the pride of their independence at other times.

Tenants Selection.

The present method of selecting tenants for your Council houses is for all the applications to be considered and then selection is made according to need. No points system is in operation and there is no anonymity. This results in a considerable amount of personal canvassing by the more persistent applicants.

Housing Management.

Your Council now own 199 houses. Routine repairs and maintenance are carried out by local contractors. Your present estates do not justify the employment of direct labour, but in the years to come the number of your houses will be increased and the maintenance will require constant attention and you may be faced with considerable reconditioning of the rural houses.

The rents of your Council houses vary between 17/9d. and 45/6. exclusive of rates. From these figures you will see that the present day building costs will not enable you to maintain low rents on your new houses unless there is a substantial increase in the rate of Government subsidy.

Your Council decided to charge an extra rent to those tenants who had allowed married children or relatives to live with them. An exception is however made in those cases in which aged parents no longer at work are being housed by their family. An additional rent is also required from tenants who use their houses for boarding visitors or for bed and breakfast guests.

The rateable value of your Council houses vary between £38 and £66.

The examination of rentals and rates may not seem at first to have much to do with public health, but it does have considerable significance. It is not unknown for persons who have been rehoused from poor quarters into modern Council houses to have to pay their rents and rates from the portion of their income which rightly belong to the purchase of food. Domestic economy can effect the general standard of the public health almost as much as environmental conditions, and some attempt must be made to maintain a balance between these conflicting factors.

Verminous Houses.

Public Health Act, 1936. Sections 83-85.

No action was necessary during the year.

Nuisances and Notices re Dwellings.

Public Health Act, 1936. Sections 91-100.

During the year the following action was taken:—

Preliminary Notices served	...	40
Statutory Notices served	...	Nil

In no case was it necessary to obtain an Abatement Order from the Court.

Certificates of Disrepair.

Housing Repairs and Rents Act, 1954. Section 26.

No certificates were issued during the year.

Dangerous Buildings.

Public Health Act, 1936. Section 58.

No action was taken during the year.

Caravans.

Caravan Sites and Control of Development Act, 1960.

At the end of the year there were 10 licensed sites, holding some 280 caravans, although most of them were concentrated on one large model site at White Cross Bay.

The introduction of the Caravan Sites Act into our Lakeland valleys has been smooth and effective. We have enjoyed the help and support of the Lake District Planning Board, and the National Trust, and most of the land owners. We have deliberately set a high standard, and the site operators have accepted that policy: indeed some of them have gone much further to enhance the attractions and service on their sites. We have had many discussions with them about the interpretation of the new laws, and they appreciated our practice of framing the licence conditions to be tailor-made to fit their own particular site. Perhaps that is why there has not yet been one single appeal to the Courts throughout Westmorland against our quite stringent conditions on the hundred or more caravan site licences. Everyone now accepts the idea that second-rate sites are not good enough for our National Park, and I am more than grateful for the enthusiastic support of all our enlightened caravan site operators.

A site for possibly some 60 to 80 caravans, a dozen or more chalets, and perhaps 75 to 100 tents, was investigated at Neaum Crag, Skelwith Bridge, in conjunction with the Lake District Planning Board. At the year end, efforts were in train to see how the difficulties could be overcome for access, water supplies and other site works, and a start had been made by the Lake District Planning Board who intend to operate the site themselves. The site is expected to be opened in 1964.

Tents, Vans, Sheds and Movable Dwellings.

Public Health Act, 1936. Sections 268-270.

The control of tented camp sites is still very haphazard: this is due partly to the weakness of the law, and partly to the physical

impossibility of patrolling the whole district at peak holiday times.

During the year 3 licences were in force for tented camping sites: these were well operated, and were the least of our troubles. Our major problems arise each season from the host of casual tents which appear on our roadside verges, our commons, odd fields, and even on mountain tops.

This fiercely individualised mode of spending the night in our National Park is characterised by primitive sanitary arrangements which are often highly dangerous to the public and private water supplies, apart from any aesthetic considerations: piles of putrescent refuse and unsightly litter mark the more popular spots: the campers often add to their own risks by drinking unboiled water taken from polluted becks, and complain reproachfully to me when they recover from the dramatic consequences.

But it would be a mistake to think that all our camping visitors behave so fecklessly, or that they are like the small number of rowdies and hoodlums who doss down in tents and barns, and cause so many complaints of vandalism and bad behaviour at Bank Holiday weekends. Some of our tented campers bring with them all the proper know-how of field craft, and I should particularly like to record my praise of the magnificent standards of camp hygiene practised by the Boy Scouts, Girl Guides, and most of the Army and cadet units, who are our guests in summertime.

Nevertheless there is a rapidly growing tendency for even officially organised schemes to include camping out in the higher mountains, sometimes endangering the gathering grounds of the public and private water supplies. Adventure Training courses for school cadets and Service units, the Duke of Edinburgh's Award schemes, and various other Youth Organisations, need to be especially aware of the areas where we should prefer them not to indulge in primitive sanitary arrangements. I am sure that they will co-operate in safeguarding the public health, and we are now seeking some more efficient liaison machinery to assist these excellent outdoor Youth activities on our fells. There is plenty of available space.

Of course we expect that the members of such properly organised parties will behave sensibly, but we never feel so sure about the casual visitor with a tent on the back of his car, his bicycle, or tied to his rucksack. He probably does not possess so much know-how, and the reminders for self-discipline may not be so pressing. He soon finds out that our district is desperately short of enough properly serviced sites for tented camping, and so he makes his rather bad best of what is perhaps our own bad job. The only sane long-term

solution is to see that enough decent safe sites are provided, and looked after so well that all but the cranks and the crooks will be attracted to them.

It would not do to get these camping problems out of perspective. There are still miles and miles of unblemished scenery all over the District, but we should not care to see them spoilt. And we have the public health to think of as well: ours and the visitors'.

WATER SUPPLIES.

Water Act, 1955.

General.

The public water supplies are installed in six areas of your Urban District: Ambleside, Grasmere, Hartsop, Chapel Stile, Patterdale and Little Langdale. The quality of the Ambleside and Grasmere supplies is satisfactory after treatment, but the Chapel Stile supply is variable. The results of laboratory examinations of the raw and treated waters are set out in Appendix A.

The Grasmere supply is unfailing in quantity. The Ambleside supply is generally adequate except in periods of drought, when the grossly excessive consumption makes it necessary to purchase water from the Thirlmere aqueduct of Manchester Corporation.

The Chapel Stile supply runs very short in dry weather, but there is a chlorinated ancillary supply from the main beck.

The Hartsop supply completed in 1949, and the Little Langdale supply in 1951, seem to be meeting the local needs of those two small communities, and completion of the main Patterdale scheme has recently brought much needed relief.

Outside the areas of the public water supplies conditions are generally poor. There are a few small privately-owned systems of varying quality, and the rest of the District relies upon becks, small runners, superficial springs, and the surface drainage catchpits, unreliable in yield and many of undesirable quality.

No comprehensive survey has been made of individual private water supplies, and staff shortage precludes one.

Shortage of water is brought to my notice in times of over a fortnight's dry weather by the frequent complaints of distress from the village of Troutbeck and other outlying areas. It is ironical that a district with 70 to over 100 inches of rain in a year should be short of water, but the reason is that impervious volcanic rocks cause a rapid run-off and the storage capacity of privately-owned systems has been

dictated more by economy than foresight. The quality of the average private supply fluctuates widely, and I can do no more than warn the users that they drink it at their own risk, that they should have it tested for purity at regular intervals, and that if in doubt they should boil it.

1962 marked the end of your Council's historical role as the statutory water undertakers for your District. The year saw the transfer of functions to the newly formed Lakes and Lune Water Board. You will of course still be expected to see that the quality of the public water is properly maintained, and you will no doubt wish to press the Water Board to extend the areas of supply.

At the end of 1963 the Ambleside public water main was being extended to Skelwith Bridge. I particularly welcome this, because we have had a lot of recurrent intestinal illnesses in those areas of indifferent and dangerous private water supply systems.

We shall continue to operate the excellent liaison arrangements with the Westmorland officers of the Ministry of Agriculture, Fisheries and Food, for the joint investigation and assessment of applications for grant-aided farm water supply schemes. I have been most grateful for the longstanding co-operation of the Ministry's Regional Advisory Bacteriologist and the other staff at the Regional Headquarters in Newcastle-upon-Tyne. It enables us to co-ordinate the safeguards to the public health as well as the agricultural interests.

General Provision of Baths and Hot Water Systems.

The 1961 Census revealed that about 24% of unshared dwellings in our District had no fixed bath. Although far from satisfactory, it is an improvement since the 1951 Census when 44% were without.

The 1961 Census showed also that about 15% of such households are without a hot water tap. There is still a lot to be done to bring our older and smaller cottages up to acceptable modern standards. I hope that grants will help to achieve this.

SEWERAGE.

Disposal Methods and Works.

Public Health Act, 1936. Section 15.

Public sewerage systems are at present very limited in the District.

Ambleside.

Ambleside is the only area within your District which possesses a sewage disposal plant of any size. These works had not been functioning efficiently, due to disrepair, and certain shortcomings in design. The final effluent was very variable in quality during normal working and extremely bad during the bizarre weekly flushing technique, causing massive pollution of the river with untreated sewage.

Consequently your Council have been undertaking a major reconstruction, with an activated sludge-type modern disposal works. It was already in use by the end of 1963 while the final constructional work was still being completed.

Chapel Stile.

Chapel Stile is sewered into a large septic tank which has an outfall into the river. It is not satisfactory in operation, and inadequate for any further development. In spite of routine emptying by your Council, the tank overflows crude sewage into the river, and there is no room for secondary treatment. Chapel Stile really needs a complete new disposal works as the only practical alternative to polluting Great Langdale Beck.

Troutbeck.

Troutbeck has a short length of sewer which serves only a few houses and leads into a small septic tank belonging to your Council. It does not seem to give much trouble. It is hardly worthy to be classed as a disposal works and it would be unlikely to carry much additional load.

Patterdale.

Patterdale is sewered by a short length of piping into a septic tank belonging to your Council in Robinson's field.

Elsewhere.

No public sewerage exists in Glenridding, Rydal and Little Langdale, nor in the more scattered rural hamlets and townships.

Grasmere.

The greatest need for a proper public sewerage system and an efficient disposal works is in Grasmere. It has neither at the moment. There is a very primitive sewer which serves only a small part of the

township and gets some sort of partial treatment in a tank at Pavement End, but most of Grasmere empties into a host of individual cesspools, cesspits and septic tanks, and there are even privies in the middle of the village. The tanks are mostly obsolete and inefficient. Many of them were designed for much smaller loads when they served the private houses which since became turned into hotels, boarding-houses and catering places. Many are quite unable to cope with the huge influx of seasonal visitors into Grasmere, the day-trippers and the passing motorists.

The foul effluents from these rudimentary and overloaded tanks overflow on the surface when they cannot soak away into the gravel subsoil, or get into the beck running through the village, or they pollute the shore and water of Grasmere lake. A lot of complaints are heard from residents and visitors about the unpleasant smells in the central parts of the village, and there are definite risks to public health.

Your Council have approved in outline and general principle your Consultant Engineers' scheme for installing a proper sewerage system and disposal works for Grasmere Village. It will probably be a difficult and expensive scheme, but it is sorely needed to abolish the privies and the tanks and the smells. Your Council instructed the Consultant Engineers during 1962 to proceed with the detailed designs for the approval of the Ministry of Housing and Local Government.

This is a great step ahead. Not only will Grasmere Village be provided with sewers, but it may be one of the first places in this country to have the disposal works out of sight, entirely underground. This would be a most progressive step, and it must be welcomed as exemplary practice in a National Park, and particularly in such a precious village as Grasmere.

Progress with this scheme has been hanging fire rather noticeably since 1962, and I should like to see more sense of urgency brought to bear on it. I am not at all satisfied about the public health dangers at Grasmere, and the local doctor shares my misgivings. We do not want another Zermatt here.

Prevalence of Water-closets and Other Methods.

Water-closets have been installed mainly in the areas which are served by public sewers and in the better type of house where private sewage systems have been made. The 1961 Census revealed that about 12% of our houses are still without a water-closet. Let us try to get more of these status symbols.

Conversions.

Public Health Act, 1936. Section 47.

Seven earth-closets were abolished during the year. Four conversions to water-closets were made during the year with the help of 2 Discretionary Grants and 2 Standard Grants.

As your District is the nucleus of the National Park and will receive an increasing number of holiday visitors from this country and overseas, it is most desirable that the extension of your sewerage schemes shall be followed by the conversion of earth-closets, privies and privy-middens to more hygienic water-closets. I hope that full advantage will be taken of standard grants.

Public Conveniences.

Public Health Act, 1936. Section 87.

Public conveniences are situated at Ambleside, Glenridding, Grasmere and Waterhead. From time to time they suffer grievously at the hands of hooligans who do wanton damage to the fittings and exercise their perverted artistic talent on the walls. It seems a curious trend in public morals, but the sheer malicious damage of pipes, seats, pedestals, and other fittings, all public property, is so sad. Perhaps the answer lies somewhere in the field of preventive psychiatry.

PUBLIC CLEANSING.

Refuse Collection.

Public Health Act, 1936. Section 72.

Domestic refuse is collected from the whole of your District with the exception of a few detached and isolated dwellings. Your Council's own vehicle and staff are used for the work.

Refuse Disposal.

Public Health Act, 1936. Section 76.

Disposal of refuse is carried out by partially controlled tipping on three sites at Grasmere, Patterdale and Brathay.

The whole matter of refuse disposal has always been a difficulty in your District. You need more labour to conduct your tips properly and you may need to acquire covering material. Controlled tipping ought to be universal in a National Park, and the creation of serious nuisances is indefensible. I think you should aim at centralising your tips, thus limiting the nuisances and favouring better supervision of the tip faces.

Street Cleansing.

Public Health Act, 1936. Section 77.

The work is undertaken by the Highways Department, and the streets are well maintained.

FOOD AND DRUGS.

General Powers.

Food and Drugs Act, 1955.

Your Council bear most of the statutory responsibility for safeguarding the public from foodborne diseases. The main aim is directed towards securing proper and hygienic conditions for the manufacture, preparation and sale of food. The secondary aim is to trace and localise any outbreaks of disease which may occur in spite of preventive measures.

Precautions against Contamination.

Food hygiene is steadily improving throughout your area. Public opinion is well ahead of the law and most traders are aware of the fact; the good food trader does not need official instruction in basic cleanliness or the enforcement of legal minimum standards. He may welcome advice on technical problems, but his aim is how high he can get, not how low he can get away with.

The responsibility for safe food does not rest entirely with the trader as the housewife must play her part as well. Quite a lot of strange things happen to food between the shop counter and the dinner plate, and the educational campaign has had to be carried into the home.

Foodborne diseases, mild dysenteries and attacks of diarrhoea and vomiting are not infrequent in our homes and among our visitors. I am confident that higher standards will reduce these preventable diseases.

Ice-Cream Trade.

Food and Drugs Act, 1955. Section 16.

Ice-Cream (Heat Treatment, etc.) Regulations, 1947.

The following premises were registered under Section 16 of the Food and Drugs Act, 1955:—

Manufacture by hot mix, cold mix, storage and sale	...	1
Manufactured by cold mix, storage and sale	...	Nil
Storage and sale only	... ..	45

Prepared Meats.

Food and Drugs Act, 1955. Section 16.

The number of premises on the Register under Section 16 of the Food and Drugs Act, 1955, used for the preparation of sausages, potted meats, pressed meat, and pickled foods was 9 at the year end. No particular difficulties have been encountered in these trades.

Sanitary Conveniences at Inns.

Public Health Act, 1936. Section 89.

One Legal Notice was served on the owners of licensed premises calling for improved sanitary accommodation.

MILK.

Registration of Milk Distributors and Dairies which are not Dairy Farms.

Milk and Dairies Regulations, 1959.

Total number of registered Distributors	...	...	...	23
" " Dairies	...	...	...	0

Pathogenic Organisms in Milk.

Food and Drugs Act, 1955.

Biological and other test results on samples taken by various Authorities, from sources in our area, continued to be passed to me. I have had no cause during the current year to serve any notices under the Milk and Dairies Regulations to restrict the sale of milk or the activities of milk-handlers.

With the eradication of bovine tuberculosis, it seems likely that the next milkborne disease to be tackled may be brucellosis. I believe that many human cases go unrecognised.

Licensed Slaughterhouses and Knackers' Yards.

Food and Drugs Act, 1955.

There are no slaughterhouses and no knackers' yards in your District.

Condemnation of Meat.

Food and Drugs Act, 1955.

All slaughtering is carried out at the Kendal Abattoir where the meat is inspected by the Borough Inspectors. No meat was condemned after distribution in your District.

Condemnation of Other Foods.

Food and Drugs Act, 1955.

The following foodstuffs were condemned by your Inspector during the year:—

Tinned Danish Ham ... 11 lbs.

Method of Disposal of Condemned Food.

The Minister of Health requires me to describe the current methods for the disposal of condemned food. In this District it is by burial at Ambleside Tip.

GENERAL INSPECTIONS.

Your Council employ one part-time Public Health Inspector and his salary is apportioned between his sanitary inspection duties and his other duties in a proportion approved by the Ministry of Health.

It is difficult to arrange duties in combined appointments in a small local authority, particularly when an Inspector is single-handed, and there has to be considerable elasticity to cover all the responsibilities.

Mr. McAdam was away ill for most of the last quarter of 1963, but happily has since recovered. I would like to record my appreciation for our colleagues who carried out all his more urgent duties while Mr. McAdam was away. Between them all, we were able to keep the department ticking over until his return. It was a fine co-operative effort on the part of the Lakes U.D.C. staff. Mr. McAdam will be retiring in 1964, and I hope that we shall get an equally good man to succeed him.

Your Inspector carries out his duties in a most able manner, and during the year he made 726 inspections on all types of work, but there is a limit to what one man can do in a day, and we are both anxious to maintain the efficiency of our Department in carrying out your Council's responsibilities.

Tabulated summary of work carried out by the Public Health Inspector:—

Housing Inspections	...	...	...	...	...	183
New Houses	...	...	...	...	...	92
Building Byelaws (Town and Country Planning Act)	...	...	...	...	...	160
Food Premises	...	...	...	...	...	20
Factories	...	...	...	...	...	3

Drainage	100
Infectious Diseases	1
Rooms fumigated	1
Caravans	33
Miscellaneous	91
Sewerage Disposal	33
Water Samples	5
Surveys	4
	726

Offensive Trades.

Public Health Act, 1936. Section 107.

There are no offensive trades in the District.

Factory Inspections.

Premises.	Number of Premises.	Number of		
		Inspections.	Written Notices.	Occupiers prosecuted.
Factories in which Sections 1, 2, 3, 4 and 6 are to be enforced by Local Authorities ..	1	1	—	—
Factories not included in (1), in which Section 7 is enforced by Local Authority	29	2	—	—
Other premises in which Section 7 is enforced by the Local Authority (excluding out-workers' premises)	—	—	—	—
Total	30	3	—	—

No defects were found.

Factories.

Factories Act, 1937-1959.

There are 30 factories on the Register. Five inspections were made and no written notices were served. No Legal Notices remained outstanding at the end of the year. No prosecutions were required. No references were made to H.M. Inspector and none were received from him.

During the year I made a series of personal visits to H.M. Inspector of Factories at Carlisle, to reconcile our respective registers, and to discuss certain policy matters with H.M. Medical Inspector.

No lists of outworkers were supplied to your Council by factory owners, and I have no official knowledge of any cases of default in this respect.

There are no basement bakehouses in the District.

H.M. Inspector of Factories has been given details of your Urban District's administration of the relevant sections of Parts I and VIII of the Factories Act, 1937.

Shops Act, 1950.

Twenty visits were made under the Shops Act for the supervision of sanitary accommodation, washing facilities, and the maintenance of suitable temperature. Informal Notices were served whenever any contraventions were observed.

Common Lodging Houses.

Public Health Act, 1936. Part IX.

There are no registered common lodging houses in the area.

Pests Act, 1949.

Your District is covered by the South Westmorland Joint Pest Control Board. Regular visits are made to your refuse tips which seem to attract rather an undesirable number of rats.

Rent Restriction Acts.

No action was taken during the year under the Rent and Mortgage Interest Restriction Acts, and any contraventions of Section 4 of the Housing Act, 1936, regarding rent book entries, were corrected informally.

Smoke Abatement.

Clean Air Act, 1956.

No action was required.

Public Mortuary and Post-mortem Room.

Public Health Act, 1936. Section 198.

Adequate facilities are available at Windermere and Kendal and H.M. Coroner and the Pathologist prefer to have bodies taken to the mortuary and postmortem rooms at Westmorland County Hospital, Kendal.

Laboratory Services.

Public Health Act, 1936. Section 196.

The Public Health Laboratory Services at Preston and Carlisle provide the necessary facilities for most of our public health investigations.

Compulsory Removal

National Assistance Act, 1948-1951.

One elderly lady, living alone at Waterhead, became unable to cope with cleaning herself or her house, and was in danger of life and limb. After a lot of persuasion she accepted the advice of the County Welfare Officer and myself and entered the Hostel at Staveley. She improved considerably for many weeks, but then died rather suddenly.

Such cases are extremely distressing to deal with and the course of compulsory removal is reserved to meet the emergencies of a last resort when all other methods of help have failed. Sometimes it is very hard to decide what is really in the best interests of the patient.

A special conference was held during 1961 with the Welfare Authority to see what more could be done to prevent people from getting into such difficulties. Home help services, hostels, and partial dependency schemes may meet some of the problems. I hope that the harsh step of compulsory removal will be less needed as time goes by. It is so often tantamount to a death warrant.

Byelaws.

Byelaws on public health matters are in force for:—

- Building.
- Slaughterhouses.
- Food handling.
- Water misuse or contamination.

APPENDIX A.
Laboratory Examination of the Public Water Supplies.

Nature of Test	Standards Max.	Ambleside Raw	Ambleside Treated	Grasmere Raw	Grasmere Treated	Patterdale	Great Langdale	Little Langdale	Hartsop
Pr. coli count 37°	3-10	0	0	5	0	0	1	0	1
Faecal coli/strep	—	14.11.57	5.11.63	14.11.57	17.12.63	4.5.63	17.12.63	17.12.63	+
Date sampled last	—	14.11.57	5.11.63	14.11.57	17.12.63	4.5.63	17.12.63	17.12.63	18.10.62
Character	—	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
Reaction pH	—	6.8	7.0	7.0	7.5	8.1	7.4	8.8	7.3
Ammonical Nitrogen	.041	.01	.01	.01	0	0	0	.01	0
Albuminoid Nitrogen	.066	.01	.02	.01	.01	0	.01	.01	0
Total Solids	1000	38	60	35.2	48	50	44	44	56
Hardness—Total	300	18	45	20	23	33	23	28	33
Carbonate	—	—	15	—	19	31	17	22	25
Non-Carbonate	—	—	30	—	4	2	6	6	8
Chlorides	30	9.3	10	8.6	—	—	—	—	—
Nitrates	1	0	0.1	0	.12	.14	.27	.12	.29
Nitrites	—	Minute trace	0	0	0	0	0	0	0
0.2 Absorbed	1	.36	.20	.24	.2	.06	.10	.16	.08
Heavy Metals	—	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Rainfall 24 hours	—	14.11.57	20.11.62	14.11.57	24.6.59	17.6.59	24.6.59	24.6.59	17.6.59
Date sampled	—	Liverpool	Lancaster	Liverpool	Preston	Preston	Preston	Preston	Preston
Laboratory	—	Liverpool	Lancaster	Liverpool	Preston	Preston	Preston	Preston	Preston

Chemical analyses expressed in parts per million.



