

1936.
NEW ZEALAND.

FIRE BRIGADES OF THE DOMINION

(REPORT ON THE) FOR THE YEAR ENDED 31ST MARCH, 1936, BY THE
INSPECTOR OF FIRE BRIGADES.

Presented to both Houses of the General Assembly by Command of His Excellency.

The INSPECTOR OF FIRE BRIGADES to the HON. MINISTER OF INTERNAL AFFAIRS.

Office of the Inspector of Fire Brigades,
Wellington, 24th October, 1936.

SIR,—

I have the honour to submit the twenty-eighth annual report for the year ending 31st March, 1936, on the working of the Fire Brigades Act, 1926.

FIRE DISTRICTS.

The Borough of Morrinsville was declared a fire district during the year, and the Dunedin Metropolitan Fire District was extended to include the boroughs of St. Kilda and Green Island. The metropolitan district now comprises the areas of the City of Dunedin and the boroughs of St. Kilda, Green Island, and Mosgiel. The number of fire districts in operation at the end of the year was fifty-four.

DOMINION FIRE WASTE.

The loss by fire in New Zealand during 1935, estimated on the same basis as previous years, was £607,410, being an increase of £41,298, or 7·3 per cent. The following table shows the fire losses in New Zealand, Great Britain, Canada, and the U.S.A. for the past nine years expressed in relation to population, which is probably the most satisfactory method for purposes of comparison.

| | New Zealand Fire Loss. | Fire Loss per Head. | | | |
|---------------------------|---------------------------|---------------------|----------------|---------|------------------------------|
| | | New Zealand. | Great Britain. | Canada. | United States of America. |
| | £ | s. d. | s. d. | s. d. | s. d. |
| Average (1927-31) | 1,332,032 | 18 1 | 5 0 | 17 5 | 16 0 |
| 1932 | 867,714 | 11 5 | 3 9 | 16 8 | 13 2 |
| 1933 | 644,781 | 8 4 | 4 7 | 12 11 | 8 10 |
| 1934 | 566,112 | 7 3 | 4 1 | 10 0 | 8 7 |
| 1935 | 607,410 | 7 9 | 4 0 | 8 9 | 8 1 |

In my annual report for last year the opinion was expressed that the fire losses for 1934 were probably the minimum that could be expected under the conditions existing in New Zealand. This view is confirmed by the increased losses occurring in 1935. This increase is not large enough to have any great significance. A slight but definite improvement in financial conditions occurred during the year, and this is probably reflected in slightly higher values with consequent greater payout on insured property. It is, however, rather disturbing to note that the number of outbreaks of fire on which insurance was paid increased by 13·2 per cent. and now exceeds five thousand for the first time since 1929. The number of outbreaks in urban areas is also the highest on record.

During 1936 there has been a marked increase in building-costs and in property values generally. As the fire-loss figures are based on the returns submitted by insurance companies, of amounts paid out in respect of fire, and these payments are in turn dependent on the value of the property at the time of the fire, it is to be expected that, irrespective of the increase in the number or severity of fires, there will be a substantial increase in the apparent fire loss.

It is necessary to point out that with the return of more prosperous times the conditions which caused the excessive fire wastage of the peak period of 1924-31 are likely to recur unless adequate steps are taken to prevent this. In the main the factors which contributed to the reduction in fire losses in the past few years can be best relied on to prevent an undue increase in the destruction due to fire in the future. These may be briefly set out as follows:—

1. *The Limitation of Insurance Cover in Relation to Property Value.*—The evils of over-insurance have been emphasized in these reports, and also on occasions of coronial inquiries into fires of suspicious

origin. There is little doubt that the more stringent system of inspection of risks adopted of recent years by many of the companies has had an important effect both in bringing home to the public the necessity for greater care in respect to fire, and also in reducing the tendency to incendiaristic fires. Unfortunately this inspection system is by no means general, and in at least one or two cases there appears to be a tendency to accept owners' valuations without question. This is, of course, done with the knowledge that under the insurance contract the actual value and not the insurance cover is the determining factor in the pay-out after a fire.

2. *Fire-prevention Propaganda.*—Experience in other countries has shown that regular fire-prevention propaganda has considerable value in reducing the fire wastage. This is confirmed by the effect of the Fire-prevention Weeks held in New Zealand during the past few years. It is therefore most desirable that these should be continued.

3. *Improvement of the Organization, Plant, Equipment, and General Efficiency of the Fire Brigades.*—The results obtained by the brigades in many of the fire districts show that a considerable reduction in damage caused by fire can be obtained by improvement in brigade efficiency. This will of course result in additional expenditure, and reference to this matter is made elsewhere in this report.

4. *Improvement in Building Construction and Fire Protection.*—A great deal can be done to limit fire loss by the adoption of fire-resisting construction in the building itself, the protection of exposures, the fitting of automatic fire-alarms, sprinklers, first-aid equipment, and also of rising mains for fire brigade use. This is not only a matter for local authority building by-laws, referred to elsewhere, but for an insurance tariff giving adequate differential rates in favour of buildings which are efficiently protected against fire.

5. *Prevention and Detection of Incendiarism.*—Valuable results have been achieved in the last few years in connection with this class of fire, both by the fire brigades and the police. Searching inquiries are made by the police into the cause of all fires, and those of doubtful origin are given special investigation. If considered necessary a coronial inquiry is held. Publicity has been given these facts in all fire-prevention propaganda. A continuance of this system is regarded as essential.

FIRE LOSS IN FIRE DISTRICTS.

It will be seen from Tables II and IV attached that the loss in fire districts (during the year ended 31st March, 1936) was £181,296, and in areas protected by Fire Boards, £2,940, or a total loss of £184,236, as compared with £177,734 for the previous year. Six fires occurred in fire districts during the year in which the loss exceeded £5,000. Details of these are as follow: Cabaret, Auckland (3.30 a.m.), £5,360; picture theatre, Otaki (4.15 a.m.), £6,495; box-factory, Taumarunui (5.5 a.m.), £5,187; auction-room and shops, Westport (2.30 a.m.), £9,223; hotel and shops, Tauranga (Saturday, 2.30 p.m.), £11,338; bargain store, Wanganui (Sunday, 1.17 p.m.), £5,718. These six fires account for about 22 per cent. of the total fire loss. It is interesting to note that although the number of outbreaks of fire has increased considerably, the number of fires at which the brigade's attendance was necessary has remained practically stationary for the past four years, the number of property fires attended being—1932-33, 737; 1933-34, 732; 1934-35, 775; 1935-36, 783. The fire loss per head in fire districts for the year 1935 was 5s. 10d., as compared with 9s. 5d. in the remainder of the Dominion.

FIRE-PROTECTION SERVICE.

Inquiries made during inspection visits into the working of brigades at fires tend to confirm the opinion expressed in this report last year, that the advance made in general organization and equipment during recent years has been a very important factor in reducing the fire losses. The keenness and enthusiasm of the firemen themselves is in most cases worthy of high praise, but the improvement referred to is not general, and in too many towns the firemen are still handicapped in their work by defective turnout arrangements or obsolete appliances and equipment.

It cannot be too strongly stressed that the basic costs of the fire service—station overhead, vehicle running and maintenance, uniforms, payments to or in respect of brigade personnel, travelling-expenses, and Board administrative charges—which constitute the major part of the Boards' annual expenditure, are the same whether or not the brigade is properly equipped and organized for its work of fire fighting. In most cases the additional expenditure necessary to bring the brigade up to the required standard of efficiency represents only a small percentage increase on the present charges, and would be quickly recouped by the contributing bodies—directly by the insurance companies in the form of reduced fire loss pay-out, and indirectly by the municipality in the saving of the citizens' property and the lesser disturbance of normal business conditions. It is desired to direct particular attention to the following deficiencies:—

Fire Alarm System.—Despite recommendations made both in these reports and in reports on annual inspections, there are still a number of the smaller Fire Board towns which rely on the manual ringing of a firebell to call the brigade in the event of fire. It is axiomatic that only in the early stages can a fire be effectively stopped, and experience shows that the electrically-controlled alarm system operated from the telephone exchange, which costs from £50 to £100 to install, will result in a saving of several minutes in the time of response by the brigade. It must also be noted that in many of the larger towns where street fire-alarm systems have been installed the extension of these systems has not kept pace with the growth of the town.

Fire Engines.—It has been stressed in these reports for several years past that owing to the water-supply conditions existing in most towns, the brigade cannot be regarded as efficient unless it is equipped with a fire-pump for boosting purposes. The technical reasons for this requirement have been explained

in detail and demonstrations have been given in a number of towns, but more than half the Fire Board brigades are still not provided with a fire-pump despite the fact that suitable machines are now available at a cost of £600 and upwards, depending on the type of body required.

It has been found necessary to call the attention of a number of the Fire Boards to the desirability of replacing the existing fire engines. The paint and metal work of these machines still shines and they have done very small mileage and are apparently in efficient mechanical condition. The reluctance to part with them is understandable, but it must be remembered that manufacturing technique has greatly advanced in the past ten years. The speed, road ability, and braking systems of modern motor-vehicles, together with the sealing of the roads, have resulted in a considerable increase in the average speed of traffic, and it is essential that the fire engines, or at any rate the main appliances, should be kept up to the modern standard. The machine of ten or fifteen years ago, with its high loadline and two-wheeled braking system, cannot be regarded as efficient for the high-speed work required of fire engines, and machines of this type should be relegated to duty as reserve equipment. There is also the additional factor to be considered that crystallization of metal is likely to take place even with machines not in constant use, and from this aspect also a machine of more than fifteen years' service cannot be regarded as anything but a reserve appliance.

Brigade Turnout.—Attention was called in the last annual report to the weakness which exists in many of the larger town organizations in respect of turnout to evening or weekend fires. The following table sets out the average losses in the cities for the past three years from daytime, evening, and night fires, and shows the necessity for maintaining an adequate staff for quick turnout during the evening hours. In a number of the larger towns arrangements have been made for at least one squad to be on duty at the station from 7 p.m. onwards, and the extension of this system to all the larger towns is strongly recommended.

Three-year Average, 1934-36.

| Period. | Number of Fires. | Percentage of Total. | Fire Losses. | Percentage of Total. |
|----------------------------|------------------|----------------------|--------------|----------------------|
| | | | £ | |
| 6 a.m. to 6 p.m. | 272 | 54·29 | 25,950 | 19·78 |
| 6 p.m. to Midnight | 148 | 29·54 | 49,474 | 37·72 |
| Midnight to 6 a.m. | 81 | 16·17 | 55,753 | 42·50 |

General Equipment.—The more general provision of salvage equipment referred to in previous reports is most desirable. In one case in which the equipment was provided for one of the smaller town brigades during the year, the saving at the first fire at which it was used amounted to several times the total value of the equipment. The provision of salvage gear also has a psychological effect on the brigadesmen, and encourages the adoption of fire-fighting methods which minimize water damage. Only a few of the larger brigades are provided with deluge sets or other equipment for large fire streams. These are only infrequently required, but their provision in the larger towns is most desirable. The question of smoke-protection equipment is referred to elsewhere in this report.

For the reasons set out in my last annual report the question of Fire Board expenditure cannot be dissociated from the insurance aspect of the problem. The opposition to the increased expenditure necessary for efficiency has not been confined to the local authorities' representatives on the Boards, and there appears to be a reluctance on the part of some of the insurance representatives to approve any increase in Fire Board expenditure which will increase the existing ratio between Fire Board levies and insurance premiums.

It is claimed by many of the insurance interests that they should not be required to contribute to Fire Board expenditure, since insurance rates are in principle based on the fire risk existing in the individual towns, and this is in turn controlled to a large extent by the comparative efficiency of the local fire-protection service. In theory this may be correct, but in practice, owing to insurance tariff anomalies which are difficult of correction, it is far from being the case. The fact remains that the law requires the insurance companies to provide approximately half the cost of Fire Board operations. It is prudent business practice to increase expenditure up to the point of maximum return. Under the present conditions a number of the brigades are unable, owing to inefficient equipment, to reach full efficiency and, judged from the business aspect only, the extra expenditure necessary to achieve a reasonable standard is amply justified.

Since 1930 the returns for fire losses in Fire Board districts have been checked with the returns supplied by the insurance companies to the Government Statistician, and the following table shows the average fire losses and Fire Board levies in fire districts, in comparison with the losses in the remainder of the Dominion, for periods of six and three years. The figures, which cover a sufficient period to be of value, clearly demonstrate the importance of the fire brigade operations in reducing the payments by insurance companies in respect of fire. It will be noted that the total payments—both fire loss and levies—made in respect of fire districts represent a much smaller percentage of premium income than the fire losses alone in the remainder of the Dominion and leave an ample margin for the small proportionate increases in expenditure recommended above. The comparison is even more favourable when it is remembered, firstly, that the insurance rates in fire districts are much lower than

in the rest of the Dominion ; and, secondly, that there are a considerable number of districts protected by fire brigades not controlled by Fire Boards, and these districts probably cover 40 per cent. of the property insured in the rest of the Dominion.

| | Insurance Premiums. | Insurance Companies' Payments. | | | | Percentages of Total Payments to Premium Income. |
|--|---------------------|--------------------------------|-------------------------------|-----------------------------------|-------------------------------|--|
| | | Fire Board Levies. | Percentage of Premium Income. | Payments in respect of Fire Loss. | Percentage of Premium Income. | |
| | £ | £ | | £ | | |
| Fire Districts : Six-year average .. | 937,692 | 68,469 | 7.30 | 277,368 | 29.58 | 36.88 |
| Rest of Dominion : Six-year average .. | 873,981 | .. | .. | 480,677 | 55.00 | 55.00 |
| Fire Districts : Three-year average .. | 910,424 | 68,039 | 7.47 | 189,084 | 20.77 | 28.24 |
| Rest of Dominion : Three-year average .. | 746,361 | .. | .. | 349,673 | 46.85 | 46.85 |

An increase in Fire Board expenditure during the coming year is inevitable owing to the general rise in prices due to the return of more prosperous times, and the increased labour cost resulting from the recent legislation. It is therefore important that this increase should not be allowed to prejudice the position. It is submitted that the figures quoted above clearly establish justification not only for the existing basis of expenditure, but for an increase sufficient to bring the fire-protection service up to a higher standard of efficiency.

BRIGADE OFFICERS.

One of the principal difficulties under the existing system of administration is that of the training of officers, particularly for the permanent brigades and the larger towns, where a high standard both of administrative ability and technical knowledge is required. There are, for instance, in the secondary brigades a number of young firemen who are promising material for the future officers of the service, but their opportunities are limited by the fact that they are unable to obtain the experience which is essential for command at major fires. An interchange of officers is most desirable, and also the training of all permanent officers at least for a period, in one or other of the city brigades, where they can obtain the necessary experience both in brigade organization and in the actual work at fires. It is difficult to arrange for any interchange of officers under the existing system of independent Boards and in most cases officers are appointed from within the ranks of the individual brigade.

FIRE BRIGADE CONTROL.

In view of the consideration which is at present being given to the reduction in the number of local authorities operating in New Zealand, attention is directed to the suggestion contained in my annual report for 1933, advocating the formation of a Dominion Board to replace the existing system of district Fire Boards. This type of control is in existence in most of the Australian States, and offers definite advantages from the point of view of both efficiency and economy. There would appear to be no reason why the detailed administration of the service, at any rate in the smaller towns, could not be carried out by the municipality. The insurance interests would be safeguarded by representation on the Dominion Board, which would have control of financial matters.

CAUSES OF FIRE.

The causes of fires are set out in Table I attached to this report, which gives particulars for all fire districts for the current year, and average statistics for five years for the seven principal cities. It will be noted that there is very little variation in the proportionate number of fires arising from any particular cause, the most notable variation during the current year being the number of fires caused by sparks from fireplaces. There appears to have been something of an epidemic of fires in wash-houses arising principally from the storage in the vicinity of the copper of rubbish ready for burning, or the use of firing which is too long for the fire-box.

The figures of average loss per fire given at the bottom of the table are interesting in showing that the brigades are successful in keeping the losses, particularly in dwelling fires, to a very low average. It should be noted that the fires covered in this table are only those which reach such proportions as to require the attendance of the brigade, and represent only about one-fourth of the total number of outbreaks which occur in fire districts. Even under these circumstances the loss was less than £100 in the case 74.2 per cent. of the dwelling fires for the past three years, and in only 7.6 per cent. did the loss exceed £500. The loss in unoccupied dwellings continued to be considerably above the average.

INCENDIARISM.

The number of fires of suspicious origin was considerably below average. The improvement which has taken place in the speed of turnout in most brigades during the past few years has resulted in a larger proportion of these fires being detected, but the improvement shown is probably due in the main to the excellent work carried out by the police in their investigations into fires, and the publicity given to these investigations during the annual Fire-prevention Week. As indicated above, it is essential that, with the improvement of conditions now taking place, there should be no relaxation of the close

investigation into the causes of all fires, which has been the practice during the past few years. Details of Court proceedings with regard to incendiarism are set out in the following table :—

| Year. | Prosecutions for Arson. | Convictions. | Dismissals. | Coronial Inquiries into Fires. |
|--------------|-------------------------|--------------|-------------|--------------------------------|
| 1931 | 28 | 16 | 12 | 5 |
| 1932 | 27 | 21 | 6 | 15 |
| 1933 | 13 | 7 | 6 | 7 |
| 1934 | 10 | 5 | 5 | 6 |
| 1935 | 19 | 6 | 13 | 1 |

DEATHS AND INJURIES IN FIRES.

The number of fatalities due to fires recorded during the year was fifteen, as compared with seventeen last year, and an average of twelve for the past five years. Of the deaths during the year, ten resulted from persons being trapped in burning buildings, and five from clothes catching fire. Eight of the victims were children. The number of persons seriously injured and requiring hospital treatment was twelve, and in addition a number of minor injuries were received at fires both by firemen and the general public. The use of petrol for home dry-cleaning was the cause of a number of persons being injured, but it is pleasing to note that no fatalities from this cause occurred during the year.

FIRE-PREVENTION.

The annual Fire-prevention Week was held in the early part of 1936 (30th March to the 4th April) and very satisfactory results were obtained. The organization is in the hands of the fire brigades throughout the country. Most of the members of these brigades are volunteers, and it is very gratifying to see the enthusiasm with which they undertake the large amount of work which is involved in the preparation of demonstrations, lectures to school-children, and the distribution of publicity matter, all of which are features of the fire-prevention propaganda. Broadcast talks were arranged from all the principal radio stations, and very valuable publicity to the movement was given, almost without exception, by the newspapers throughout New Zealand. This publicity is of particular value in the country districts where there are no fire brigades and where the press is practically the only medium of contact with the public.

The returns submitted to the Government Statistician by insurance companies show that, despite the decrease in the total amount of fire loss during the past few years, there has not been a corresponding drop in the number of outbreaks of fire, and during 1935 a definite increase in the number of these outbreaks was evidenced. In view of this fact it might be suggested that the fire-prevention work carried out during the past few years has been ineffective, but it should be noted that work of this character cannot be expected to produce immediate results. It is considered that it has at the least had the effect of creating some degree of public fire consciousness. A certain number of fires are inevitable, and if the propaganda results only in the more satisfactory handling of these fires by the individual when they do occur, something has been achieved. It is significant that in the fire district areas where fire-prevention has been most concentrated, the records quoted above show that the number of fires requiring the attendance of the brigades has been greatly reduced and maintained consistently at a lower level. There is also evidence that the educational work carried out has resulted in earlier calls being given to the brigades, and this again must be reflected in a reduction in the fire loss.

It is considered by all authorities that the most satisfactory means of dealing with this problem is the teaching of fire-prevention in the schools. Something in this direction has been done in the efforts of the fire brigades during Fire-prevention Week, and a certain amount of voluntary co-operation has been obtained from the teachers, but representations have on several occasions been made to the educational authorities that the only arrangement which would be really satisfactory would be the inclusion of fire-prevention in the school syllabus as part of the instruction in civics.

SMOKE-PROTECTION EQUIPMENT.

In previous reports attention has been called to the desirability of supplying fire brigades with efficient smoke-protection masks for general use. Until a few years ago the equipment provided in New Zealand for this purpose consisted either of a smoke helmet with connecting tube and bellows, a cloth helmet fitted with a filtering sponge which required to be moistened before use, or, in a few cases, a self-contained oxygen breathing apparatus. These were regarded purely as emergency appliances, only one or two units being supplied to each brigade and in practice they were used on very few occasions.

The New Zealand firemen are trained to fight fires inside the building wherever this is humanly possible, even though the work involves very severe punishment from heat and smoke. The exposure to heavy smoke atmospheres without protection has been regarded as part of the normal duty, and it is quite usual for the physical effects of this exposure to inconvenience the men for some days after operations at a serious fire, due to the accumulation of smoke in the lungs, even in cases where no medical treatment is necessary. The recent adoption by a number of the brigades of the canister gasmask has shown that both the discomfort and semi-permanent disability can be avoided by the use

of this type of mask without affecting in any way the working efficiency of men operating inside the building. The importance of this will be apparent when it is realized that the men may be required to deal with a second fire at short notice.

The canister which is at present being used is the general-purpose type manufactured by the Mines Safety Appliance Company of Pittsburg, U.S.A., which gives two hours protection against smoke and low concentrations of all gases likely to be met with at fires. This canister has up to the present been used with simple mouthpieces, half-masks, and full face-masks, and is carried in a satchel of similar type to the standard military pattern. Experience with this equipment has shown that in addition to the greater comfort of the firemen, the attack on interior fires, and also the salvaging and ventilation operations, have been speeded up, with a considerable saving in the damage resulting from fire, smoke, and water.

It is therefore evident that the development of smoke-masks not as emergency equipment, but for use at all fires where heavy smoke is experienced, is desirable. If a suitable mask can be obtained at a reasonable price there appears no reason why the smoke-mask should not ultimately become just as much a part of the individual firemen's personal equipment as the small axe or hand-line normally carried. The indications are that its use would be required more frequently than either of these items.

For some time past negotiations have been in progress with the agents for the general-purpose canisters referred to, but it has not been found possible to obtain a supply of this type at a reasonable cost owing to the fact that the makers limit the use of the canister to the face-mask supplied by them. This latter is considered less satisfactory, and is very much more expensive than the military type. The price of the complete mask places it beyond the finances of the smaller brigades except as emergency equipment.

In view of this difficulty investigations were made into the possibility of using the military face-mask fitted with the practice canister supplied to the Army for training purposes. This canister contains absorbent layers of cotton wool, charcoal, and cellulose, and is designed to have resistance to the smoke type of gases. A severe test was carried out by the Wellington Fire Brigade staff, the canister taken for test being selected at random from the military stores, and having been in use for a period of six years for training purposes. The following is the Superintendent's report:—

“A fire was built up in an out-building 9 ft. by 10 ft. by 12 ft., from the following materials: flint, xylonite, flock, kapoc, oily waste, and shavings, the whole being covered over with wet sacks. The fire was then ignited and allowed to burn for several minutes until dense smoke and fumes were given off. Members of the staff on duty were given ten minutes each to test out the mask; the total time of actual use being two hours. A number of the staff volunteered to try out the conditions without the use of a mask, and the maximum time suffered by any member was two minutes; then only after severe punishment. The staff reported very favourably on the efficiency of the unit, more especially considering the severe conditions of the test.”

In the use of these military masks for fire-brigade purposes there must be a definite understanding of their limitations. The tests made show that the mask is quite efficient for use at all ordinary fires, but it must be clearly understood by the firemen that it should be used as a protection against smoke only and not against poisonous gases. The mask should never be used, for instance, where fumigating gases such as sulphur dioxide or hydrocyanic acid have been used, where cylinders of compressed gases such as ammonia or chlorine have been discharged, nor for entry into atmospheres heavily charged with coal gas or petrol vapour. It does not give protection against carbon monoxide, and should not therefore be used in fires where this gas is likely to accumulate, such as slow-combustion cellar fires.

In such cases as those quoted the poisonous gases are liable to be in such concentration that there is insufficient oxygen to support life, and even the gas-resistant canister mask, which will protect the bearer against small percentages of gas up to about 3 per cent., is dangerous to use. The only equipment which is absolutely reliable as a protection against poisonous gases, particularly where concentration is unknown, is the self-contained type of oxygen-breathing apparatus. Half-hour sets of this equipment are now on the market at a reasonable price, and it is recommended that all brigades in the cities and larger towns should be equipped with at least one and preferably two of these sets for rescue work and for use either at fires or other emergencies when it is necessary to enter atmospheres which are or may be charged with poisonous gas.

The military mask has several advantages over most other types. It is light, the standard satchel equipment makes it convenient for fitting rapidly, and the contents of the training canister which it is proposed to use are much less susceptible to damage from moisture than most other types. The masks can therefore be used for drill and training without affecting their efficiency for use at fires. The adoption of the military mask for fire-brigade purposes will also ensure that at least a small staff in each town is familiar with the equipment, and brigade members would be available to train the public in their use in case of emergency. A recommendation has been made to the controlling authorities for all brigades that each fire-engine should be equipped with a minimum of four of these masks.

HAND FIRE-EXTINGUISHERS.

The servicing of hand fire-extinguishers in commercial use by the local fire brigades has been continued during the year, and a number of additional brigades have undertaken this work. The evidence obtained during this servicing shows that these appliances are a very valuable safeguard against fire. Complete records are not available, but during the year the Auckland and Wellington brigades have recharged fifty-three extinguishers which were used at incipient fires. The more general installation of these appliances is therefore to be strongly recommended, but it is necessary to again call attention to the fact that regular servicing is absolutely essential if the extinguishers are to be kept in an efficient condition and safe for use.

It was noted in the last annual report that a number of Minimax extinguishers had been found with over-charge acid bottles. This has been further evidenced during the year under review, and the possible danger arising from this over-charge was shown by a test made with one of the older extinguishers found in service with a blocked nozzle. This was discharged in this condition and a severe explosion resulted, which would probably have caused death or serious injury had the extinguisher been used in the ordinary way. It is most strongly recommended that all extinguishers of this type should be inspected to ensure that the proper acid bottles are installed. The standard bottles are made of coloured glass and are marked "A" for the 10-pint, and "B" for the 2-gallon extinguisher.

CONSTRUCTION OF BUILDINGS.

The technical committee which has been working on the preparation of a standard code of building regulations completed the preliminary draft during the year. The primary purpose of the code is to ensure a standard of construction which will be resistant to earthquake stresses, and no provision was made for the constructional requirements necessary for protection against fire. Representations were therefore made on the lines of my last annual report, and it is understood that the necessary alterations will be made before the model by-laws are issued in final form.

FIRE-FIGHTING EQUIPMENT IN BUILDINGS.

A considerable amount of attention has been given during the year to the question of fire-fighting equipment installed in Government buildings, and as similar conditions exist in most commercial buildings in the cities and large towns, it is considered desirable to make some comment for general information.

The practice in the past has been to install canvas hose (usually 2½ in., but occasionally 2 in. or 1½ in.) at convenient points in the building, permanently attached to the water supply and flaked in cradles. The hose is usually of second-grade quality and branches have been found with nozzles up to 1 in. in diameter. Installations of this type are suitable for buildings situated outside fire brigade areas, where the occupying personnel has to be relied on for dealing with a fire, but in towns where an efficient fire brigade is available they are for all practical purposes useless, and contain an element of danger in that they give a false sense of security.

In detail they are unsatisfactory because they require a minimum of two men to operate—one to turn on the water and a second to direct the stream. This class of equipment, moreover, is not suitable for dealing with a large fire and for this purpose the brigade would use its own gear. If used on a small fire more water is delivered than is necessary to extinguish it and heavy water damage is likely owing both to the seepage from the hose and to the inevitable delay in turning off the water after the fire is extinguished, particularly when operated by inexperienced personnel. It should also be noted that it is necessary that the hose should be fully extended before use and fittings of this sort are difficult to operate in narrow passages and confined spaces. The 2½ in. equipment installed in many buildings would be highly dangerous for inexperienced persons to operate under the water-pressure conditions existing in most of the cities and larger towns. A number of demonstrations of this have been given during the year and it was shown, for instance, in Wellington, that some of the equipment taken from different buildings in the city could only be handled with difficulty by two experienced firemen.

It is strongly recommended that the use of unlined canvas hose for interior fire protection should be discontinued. Only first-aid equipment should be installed for use by the occupants of the building, and for this purpose the automatic hose-reel is the most satisfactory appliance. This consists of a small reel carrying up to 180 ft. of ¾ in. rubber hose. The water is supplied through a gland in the axis of the reel and the reel is arranged so that the hose can be run out in any direction. The hose carries a shut-off nozzle and it is only necessary to run off sufficient hose to reach the fire. The reels should be so situated as to cover all rooms on the particular floor. It is found that one person can extend the full length of the hose and operate it satisfactorily, and it gives a controllable stream capable of dealing with all but severe fires. The cost is comparable with that of the existing canvas-hose installations. The reel should, of course, be regarded as subsidiary to the main fire-installation, which should consist of one or more rising mains, according to the size of the building, fitted with the type of couplings used by the local brigade. A complete installation of this type has been made in the main Government Buildings in Wellington, and can be inspected by any persons interested.

INSPECTIONS.

Most of the brigades were inspected during the year. Close touch was kept with the activities of all districts by means of newspaper cuttings, and where necessary, several visits were made. With the exception of the matters referred to above, the conditions found were generally satisfactory, and it is pleasing to report that most of the brigades have reached a high standard of training. Tests on the water-supply were made in a considerable number of towns, and recommendations made to the Boards concerned as to the development of the brigade organization.

A number of reports were made during the year with regard to public buildings. As indicated above, a general recommendation has been made regarding the improvement of the first-aid fire-protection services in Government Buildings by the elimination of canvas hoses, standardization of hose connections, and the fitting of first-aid hose-reels. A number of reports were also made to the local Government Loans Board on loan proposals for fire-protection services, water-supply and reticulation services.

I have, &c.,

R. GIRLING-BUTCHER,

Inspector of Fire Brigades.

TABLE I.—CAUSES OF FIRE.

| | Cities over 20,000 Population: Five-year Average, 1/4/31-31/3/36. | | | | All Fire Districts: Year ending 31st March, 1936. | | | | | |
|--|--|---------|--------------------|---------|--|---------|--------------------|---------|-----|---------|
| | Dwellings. | | Business Premises. | | Dwellings. | | Business Premises. | | | |
| | Number of Fires. | Loss. £ | Number of Fires. | Loss. £ | Number of Fires. | Loss. £ | Number of Fires. | Loss. £ | | |
| Defective electrical installations .. | 1.4 | 70 | 1.8 | 56 | 1 | 106 | 2 | 26 | 3 | 132 |
| Electric irons and radiators left on .. | 16.2 | 2,743 | 6.8 | 2,059 | 14 | 1,700 | 10 | 2,289 | 24 | 3,989 |
| Short circuits and overheating .. | 4.4 | 309 | 11.4 | 1,115 | 6 | 666 | 29 | 2,842 | 35 | 3,508 |
| Other electrical faults .. | 2.4 | 267 | 3.6 | 449 | 2 | 831 | 1 | 17 | 3 | 832 |
| Gas-explosions .. | 0.8 | 31 | 0.4 | 3 | 1 | 34 | 3 | 309 | 3 | 27 |
| Gas rings, &c., left on or in contact with curtains, &c. | 6.2 | 442 | 4.0 | 410 | 8 | 1,322 | 4 | 15 | 12 | 1,631 |
| Defective gas-installations .. | 3.0 | 57 | 1.2 | 134 | 7 | 53 | 2 | 823 | 9 | 68 |
| Candles in contact with curtains, &c. | 6.8 | 760 | 0.4 | 1 | 8 | 10 | 1 | 25 | 9 | 826 |
| Lamps, stoves—overturned or exploded .. | 2.4 | 117 | 1.2 | 14 | 1 | 131 | 1 | 79 | 2 | 35 |
| Miscellaneous, due to naked lights .. | 2.2 | 167 | 0.6 | 17 | 4 | 184 | 2 | 76 | 6 | 91 |
| Defective chimneys and flues .. | 19.0 | 1,740 | 3.4 | 211 | 24 | 1,951 | 8 | 1,123 | 32 | 1,779 |
| Defective hearths, fireplaces, and furnaces .. | 17.6 | 732 | 3.2 | 410 | 23 | 2,311 | 5 | 1,123 | 28 | 3,434 |
| Defective hot-water systems .. | 2.2 | 384 | .. | .. | 3 | 456 | .. | .. | 3 | 456 |
| Lighted match dropped .. | 2.2 | 3,339 | 11.8 | 5,596 | 17 | 8,935 | 9 | 74 | 26 | 627 |
| Children playing with matches .. | 20.0 | 262 | 2.2 | 116 | 11 | 263 | 1 | 2 | 12 | 265 |
| Smoking in bed .. | 7.2 | 33 | .. | .. | 2 | 71 | .. | .. | 2 | 71 |
| Cigarette or cigar butts dropped .. | 8.2 | 919 | 12.0 | 3,131 | 13 | 1,117 | 20 | 2,778 | 33 | 3,895 |
| Ashes from pipes, sparks from cigarettes .. | 2.4 | 133 | 0.4 | 68 | 4 | 179 | 3 | 61 | 7 | 240 |
| Rats chewing matches .. | 0.8 | 15 | 0.8 | 219 | .. | .. | .. | .. | .. | .. |
| Miscellaneous causes—smoking and matches .. | 34.6 | 279 | 10.2 | 300 | 53 | 5,400 | 22 | 1,734 | 75 | 13,232 |
| Sparks from fireplaces, furnaces, &c. | 4.6 | 3,689 | 1.0 | 1,105 | 7 | 283 | 4 | 7,681 | 7 | 13,081 |
| Airing clothes before a fire .. | 4.6 | 1,272 | 11.2 | 1,386 | 11 | 524 | 4 | 37 | 15 | 561 |
| Ashes placed in wooden boxes, &c. | 5.4 | 349 | 3.0 | 83 | 6 | 111 | 7 | 535 | 13 | 646 |
| Heating tar, polishes, &c. | 1.6 | 313 | 5.2 | 924 | 5 | 859 | 6 | 50 | 11 | 909 |
| Spontaneous combustion .. | 7.6 | 437 | 4.6 | 311 | 9 | 409 | 3 | 380 | 15 | 789 |
| Allowing benzine, &c., near naked lights .. | 4.6 | 520 | 2.2 | 896 | 8 | 1,198 | 4 | 242 | 11 | 1,440 |
| Arson .. | 9.6 | 3,343 | 6.6 | 9,559 | 6 | 1,130 | 4 | 7,967 | 10 | 9,097 |
| Suspicious origin .. | .. | .. | 5.6 | 1,582 | .. | .. | 8 | 1,676 | 8 | 1,676 |
| Overheating of and sparks from machinery .. | 4.2 | 175 | 1.4 | 46 | 2 | 18 | .. | .. | 2 | 18 |
| Sparks from bush and gorse fires .. | 6.8 | 193 | 2.0 | 30 | 16 | 215 | 10 | 4,733 | 26 | 4,948 |
| Sparks from rubbish fires .. | 9.2 | 213 | 10.2 | 1,248 | 17 | 451 | 6 | 541 | 23 | 992 |
| Sparks from chimneys, locomotives, &c. | 14.6 | 415 | 1.2 | 21 | 25 | 517 | .. | .. | 25 | 517 |
| Blow-lamps used for burning off paint .. | 8.0 | 2,359 | 3.6 | 251 | 4 | 60 | 5 | 770 | 9 | 830 |
| Fires spread from other buildings .. | 11.6 | 524 | 17.2 | 805 | 31 | 1,698 | 28 | 7,995 | 59 | 9,693 |
| Miscellaneous known causes .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Total, known causes .. | 259.6 | 26,963 | 147.6 | 34,262 | 353 | 36,557 | 212 | 44,061 | 565 | 80,618 |
| Unknown causes .. | 77.2 | 28,019 | 51.4 | 68,883 | 124 | 38,978 | 84 | 61,700 | 208 | 100,678 |
| Grand total .. | 336.8 | 54,982 | 199.0 | 103,145 | 477 | 75,535 | 296 | 105,761 | 773 | 181,296 |
| Loss per fire— | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Known causes .. | .. | 103.8 | .. | 232.1 | .. | 104 | .. | 208 | .. | 143 |
| Unknown causes .. | .. | 362.9 | .. | 1,340.1 | .. | 314 | .. | 734 | .. | 484 |
| All causes .. | .. | 163.2 | .. | 518.3 | .. | 158 | .. | 357 | .. | 235 |
| Unoccupied dwellings .. | .. | 419 | .. | .. | .. | 362 | .. | .. | .. | .. |

TABLE II.—MISCELLANEOUS STATISTICS FOR FIRE DISTRICTS FOR YEAR ENDING 31ST MARCH, 1936.

| District. | Popu- tion. | Rateable Capital Value. | Insurance Companies Premium Income. | Number of Fire Calls. | Fires invol- ving Loss of Pro- perty. | Insurances on Property involved in Fires. | Insured Fire Loss, Buildings and Contents. | Uninsured Fire Loss, Buildings and Contents. | Total Fire Loss. | Authorized Expenditure for Year ending 31st March, 1937. |
|----------------------------|----------------|----------------------------|--|--------------------------------|--|---|--|--|---------------------|---|
| | | £ | £ | | | £ | £ | £ | £ | £ |
| Auckland Metro- politan | 174,112 | 69,599,777 | 202,826 | 595 | 162 | 907,324 | 35,839 | 1,949 | 37,788 | 31,160 |
| Balclutha .. | 1,546 | 282,685 | 1,939 | 7 | 2 | 850 | 225 | .. | 225 | 250 |
| Birkenhead .. | 3,399 | 749,821 | 3,865 | 10 | 4 | 1,180 | 77 | 240 | 317 | 540 |
| Cambridge .. | 2,199 | 725,500 | 3,029 | 7 | 2 | 6,245 | 2,340 | .. | 2,340 | 420 |
| Christchurch .. | 92,174 | 29,299,727 | 99,059 | 343 | 95 | 287,497 | 7,864 | 832 | 8,696 | 13,500 |
| Dannevirke .. | 4,387 | 1,407,050 | 5,777 | 6 | 4 | 2,467 | 1,217 | 27 | 1,244 | 668 |
| Dargaville .. | 2,173 | 492,192 | 3,073 | 2 | 1 | 1,300 | 10 | .. | 10 | 523 |
| Dunedin Metro- politan | 66,829 | 17,750,608 | 81,478 | 474 | 79 | 194,752 | 13,155 | 1,065 | 14,220 | 14,076 |
| Eltham .. | 1,900 | 370,305 | 1,842 | 4 | 4 | 4,620 | 1,661 | 491 | 2,152 | 367 |
| Feilding .. | 4,543 | 1,416,210 | 5,435 | 10 | 3 | 7,060 | 149 | .. | 149 | 730 |
| Foxton .. | 1,613 | 259,631 | 1,642 | 8 | 4 | 3,965 | 476 | 100 | 576 | 411 |
| Gisborne .. | 13,581 | 4,582,923 | 19,773 | 21 | 6 | 26,123 | 4,990 | 644 | 5,634 | 2,240 |
| Greymouth .. | 8,106 | 1,325,090 | 7,855 | 16 | 8 | 4,600 | 1,574 | 567 | 2,141 | 1,051 |
| Hamilton .. | 16,138 | 5,180,604 | 16,747 | 42 | 10 | 13,955 | 1,504 | 249 | 1,753 | 2,921 |
| Hastings .. | 12,747 | 3,547,255 | 14,923 | 31 | 9 | 6,535 | 954 | 10 | 964 | 2,461 |
| Hawera .. | 4,660 | 1,346,295 | 6,885 | 24 | 7 | 3,530 | 67 | 4 | 1,327 | 1,327 |
| Hikurangi .. | 1,042 | 159,928 | 900 | 1 | .. | .. | .. | .. | .. | 175 |
| Hokitika .. | 2,714 | 395,008 | 2,962 | 3 | 3 | 1,575 | 1,075 | 450 | 1,525 | 603 |
| Invercargill .. | 21,495 | 5,349,550 | 23,606 | 118 | 31 | 40,150 | 2,933 | 570 | 3,503 | 4,635 |
| Kaiapoi .. | 1,598 | 317,348 | 2,047 | 3 | 2 | 1,000 | 20 | 5 | 25 | 465 |
| Kaitangata .. | 1,376 | 102,375 | 1,078 | 3 | 2 | 550 | 50 | 1,200 | 1,250 | 135 |
| Lawrence .. | 676 | 57,165 | 639 | 2 | .. | .. | .. | .. | .. | 100 |
| Levin .. | 2,659 | 765,743 | 3,209 | 5 | 2 | 5,047 | 2,374 | 447 | 2,821 | 480 |
| Masterton .. | 9,094 | 2,571,760 | 11,722 | 27 | 8 | 18,691 | 1,629 | 34 | 1,663 | 2,533 |
| Milton .. | 1,423 | 229,843 | 2,091 | 10 | .. | .. | .. | .. | .. | 165 |
| Napier .. | 15,302 | 4,114,397 | 24,186 | 31 | 16 | 69,390 | 4,756 | 315 | 5,071 | 4,394 |
| Nelson .. | 11,208 | 2,991,217 | 16,660 | 30 | 12 | 16,740 | 1,436 | 65 | 1,501 | 2,026 |
| New Plymouth .. | 16,636 | 5,063,573 | 17,599 | 39 | 7 | 22,465 | 4,235 | 200 | 4,435 | 1,795 |
| Oamaru .. | 7,486 | 1,541,183 | 7,205 | 12 | 5 | 11,050 | 718 | 230 | 948 | 1,011 |
| Ohakune .. | 1,398 | 99,654 | 1,113 | 6 | 3 | 1,440 | 335 | 100 | 435 | 214 |
| Opotiki .. | 1,438 | 333,497 | 1,838 | 4 | 2 | 650 | 373 | 1 | 374 | 385 |
| Otaki .. | 1,712 | 305,218 | 1,703 | 7 | 4 | 5,037 | 4,482 | 2,177 | 6,659 | 366 |
| Pahiatua .. | 1,667 | 359,158 | 3,060 | 4 | 2 | 3,650 | 925 | .. | 925 | 464 |
| Palmerston North | 22,191 | 7,522,610 | 27,989 | 122 | 28 | 119,770 | 4,014 | 1,097 | 5,111 | 4,881 |
| Petone .. | 10,935 | 3,151,633 | 14,732 | 20 | 6 | 8,630 | 113 | .. | 113 | 2,041 |
| Port Chalmers .. | 2,165 | 303,496 | 1,816 | 2 | 1 | 600 | 180 | .. | 180 | 252 |
| Pukekohe .. | 2,536 | 800,718 | 2,700 | 4 | 2 | 335 | 183 | 7 | 190 | 820 |
| Rotorua .. | 6,532 | 1,372,041 | 6,735 | 19 | 8 | 31,380 | 821 | 30 | 851 | 980 |
| Taihape .. | 2,181 | 409,132 | 3,360 | 6 | .. | .. | .. | .. | .. | 514 |
| Taumarunui .. | 2,636 | 655,757 | 2,788 | 9 | 5 | 17,550 | 2,155 | 3,194 | 5,349 | 484 |
| Tauranga .. | 3,393 | 890,294 | 4,066 | 17 | 3 | 8,975 | 7,708 | 3,749 | 11,457 | 642 |
| Te Aroha .. | 2,367 | 721,943 | 3,816 | 8 | 2 | 1,360 | 177 | 5 | 182 | 459 |
| Te Awamutu .. | 2,224 | 659,279 | 3,132 | 13 | 7 | 10,425 | 2,302 | 15 | 2,317 | 536 |
| Timaru .. | 17,428 | 4,727,570 | 16,534 | 54 | 16 | 29,655 | 2,289 | 40 | 2,329 | 2,601 |
| Waihi .. | 3,900 | 283,027 | 2,714 | 18 | 9 | 14,500 | 3,134 | 100 | 3,234 | 664 |
| Waipukurau .. | 2,048 | 463,005 | 2,658 | 2 | 1 | 2,357 | 824 | .. | 824 | 400 |
| Wairoa .. | 2,519 | 544,252 | 3,609 | 8 | 5 | 2,735 | 672 | 85 | 757 | 669 |
| Waitara .. | 1,977 | 332,968 | 2,179 | 1 | 1 | 150 | 150 | 50 | 200 | 244 |
| Wanganui .. | 23,168 | 5,982,496 | 29,709 | 100 | 24 | 35,161 | 6,562 | 537 | 7,099 | 6,629 |
| Wellington .. | 115,653 | 43,618,038 | 168,771 | 635 | 136 | 1,137,755 | 15,513 | 663 | 16,176 | 32,324 |
| Westport .. | 4,238 | 525,368 | 4,260 | 17 | 3 | 4,550 | 6,883 | 2,210 | 9,093 | 690 |
| Whangarei .. | 7,154 | 2,330,245 | 7,719 | 16 | 7 | 7,090 | 2,093 | 210 | 2,303 | 712 |
| Woodville .. | 1,030 | 165,894 | 1,297 | 2 | 2 | 4,117 | 3,260 | 856 | 4,116 | 322 |
| | 745,306 | 238,552,056 | 908,350 | 2,978 | 765 | 3,106,533 | 156,476 | 24,820 | 181,296 | 149,455 |

TABLE IIIA.—AVERAGE STATISTICS FOR ALL FIRE DISTRICTS WHICH HAVE BEEN IN OPERATION FOR THE THIRTEEN YEARS 1924-36.

| District. | Population. | Municipal Rates. | Rates per Head. | Insurance Premiums. | Insurance Premiums per Head. | Number of Fires. | Fires per 1,000 of Population. | Highest Fire Loss in any Individual Year. | Fire Loss. | Fire Loss per Head. | Loss per Fire. | Fire Brigade Expenditure. | Expenditure per Head. | District. |
|---------------------------------------|-------------|------------------|-----------------|---------------------|------------------------------|------------------|--------------------------------|---|------------|---------------------|----------------|---------------------------|-----------------------|--|
| | £ | £ s. d. | £ | £ s. d. | £ s. d. | | | £ | £ | £ s. d. | £ | £ | s. d. | |
| Auckland Metropolitan* | 126,876 | 619,316 | 4 17 4 | 177,464 | 1 8 0 | 190 | 1.50 | 114,709 | 65,730 | 0 10 4 | 345 | 23,738 | 3 9 | Auckland Mtrpltn.* |
| Balclutha | 1,572 | 3,735 | 2 7 6 | 2,039 | 1 5 11 | 2 | 1.37 | 7,090 | 43,905 | 0 11 6 | 421 | 328 | 4 2 | Balclutha. |
| Christchurch | 88,088 | 234,106 | 2 13 2 | 112,869 | 1 5 8 | 134 | 1.49 | 95,575 | 43,078 | 0 9 10 | 322 | 12,527 | 2 10 | Christchurch. |
| Dannevirke | 4,406 | 11,291 | 2 11 3 | 7,664 | 1 14 10 | 6 | 1.43 | 8,680 | 1,051 | 0 4 9 | 166 | 694 | 3 2 | Dannevirke. |
| Dargaville | 2,050 | 12,507 | 6 2 2 | 3,599 | 1 15 1 | 5 | 2.36 | 4,655 | 2,257 | 1 1 10 | 462 | 551 | 5 5 | Dargaville. |
| Dunedin Metropolitan | 68,416 | 190,758 | 2 15 9 | 80,121 | 1 3 5 | 107 | 1.57 | 59,793 | 26,814 | 0 7 10 | 249 | 14,054 | 4 1 | Dunedin Mtrpltn. |
| Feilding | 4,434 | 16,190 | 3 13 0 | 6,723 | 1 10 4 | 6 | 1.37 | 5,044 | 1,779 | 0 8 0 | 293 | 719 | 3 3 | Feilding. |
| Foxton | 1,739 | 4,766 | 2 14 10 | 1,852 | 1 1 4 | 4 | 2.17 | 6,830 | 2,567 | 1 9 6 | 681 | 463 | 5 4 | Foxton. |
| Gisborne | 13,867 | 61,830 | 4 9 2 | 23,300 | 1 13 7 | 22 | 1.58 | 24,240 | 11,419 | 0 16 6 | 521 | 2,471 | 3 7 | Gisborne. |
| Greymouth | 6,192 | 16,771 | 2 14 1 | 7,477 | 1 4 2 | 9 | 1.48 | 32,174 | 9,088 | 1 9 4 | 989 | 1,020 | 3 4 | Greymouth. |
| Hamilton | 15,050 | 58,837 | 3 18 2 | 21,073 | 1 8 0 | 20 | 1.32 | 25,746 | 4,563 | 0 6 1 | 229 | 2,723 | 3 8 | Hamilton. |
| Hastings | 11,361 | 36,184 | 3 3 9 | 16,130 | 1 8 5 | 18 | 1.60 | 24,504 | 7,675 | 0 13 6 | 419 | 1,767 | 3 1 | Hastings. |
| Hawera | 4,674 | 15,569 | 3 6 8 | 7,851 | 1 13 7 | 8 | 1.70 | 11,876 | 1,927 | 0 8 3 | 243 | 1,178 | 5 0 | Hawera. |
| Hokitika | 2,509 | 3,826 | 1 10 6 | 2,903 | 1 3 2 | 5 | 2.07 | 8,591 | 2,635 | 1 1 0 | 509 | 590 | 4 9 | Hokitika. |
| Invercargill | 19,504 | 70,940 | 3 12 9 | 23,408 | 1 4 0 | 37 | 1.91 | 47,221 | 13,140 | 0 13 6 | 354 | 5,319 | 5 6 | Invercargill. |
| Kaipoi | 1,717 | 2,207 | 1 5 9 | 2,404 | 1 8 0 | 4 | 2.42 | 25,984 | 3,837 | 2 4 9 | 925 | 663 | 7 9 | Kaipoi. |
| Kaitangata | 1,475 | 1,678 | 1 2 9 | 1,111 | 0 15 1 | 2 | 1.20 | 4,343 | 916 | 0 12 5 | 518 | 161 | 2 2 | Kaitangata. |
| Lawrence | 662 | 1,279 | 1 18 8 | 717 | 1 1 8 | 1 | 2.09 | 3,770 | 453 | 0 13 8 | 328 | 91 | 2 9 | Lawrence. |
| Levin | 2,592 | 6,147 | 2 7 6 | 3,815 | 1 9 5 | 13 | 1.95 | 9,745 | 6,090 | 0 16 7 | 424 | 628 | 4 10 | Levin. |
| Masterton | 8,585 | 27,525 | 3 4 1 | 12,735 | 1 9 8 | 5 | 1.54 | 18,539 | 6,090 | 0 14 2 | 460 | 2,011 | 4 8 | Masterton. |
| Milton | 1,525 | 4,019 | 2 12 9 | 2,206 | 1 8 11 | 1 | 0.90 | 1,000 | 163 | 0 2 2 | 118 | 185 | 2 5 | Milton. |
| Napier | 15,896 | 57,354 | 3 12 2 | 23,998 | 1 14 7 | 21 | 1.33 | 24,692 | 9,677 | 0 12 2 | 459 | 3,985 | 5 0 | Napier. |
| New Plymouth | 15,334 | 55,158 | 3 11 11 | 18,875 | 1 4 8 | 16 | 1.07 | 9,593 | 5,160 | 0 6 9 | 315 | 2,002 | 2 8 | New Plymouth. |
| Oamaru | 7,437 | 26,368 | 3 10 11 | 8,000 | 1 1 6 | 7 | 0.94 | 23,878 | 4,510 | 0 12 1 | 645 | 1,082 | 2 11 | Oamaru. |
| Ohakune | 1,476 | 71,138 | 3 11 1 | 30,840 | 0 18 9 | 5 | 3.94 | 11,825 | 3,381 | 2 5 10 | 628 | 428 | 5 10 | Ohakune. |
| Palmerston North | 20,093 | 25,831 | 2 9 4 | 13,310 | 1 5 9 | 36 | 1.78 | 31,637 | 13,460 | 0 13 5 | 376 | 3,974 | 3 11 | Palmerston North. |
| Petone | 10,350 | 25,831 | 2 9 4 | 13,310 | 1 5 9 | 9 | 0.89 | 5,070 | 1,715 | 0 3 4 | 187 | 1,662 | 3 2 | Petone. |
| Port Chalmers | 2,546 | 4,450 | 1 15 0 | 2,250 | 0 17 8 | 3 | 1.14 | 2,135 | 733 | 0 6 2 | 270 | 245 | 1 11 | Port Chalmers. |
| Rotorua | 5,054 | 9,023 | 1 15 9 | 6,987 | 1 7 8 | 9 | 1.81 | 7,416 | 2,705 | 0 10 9 | 296 | 1,072 | 4 3 | Rotorua. |
| Taurarunui | 2,480 | 8,191 | 3 6 1 | 3,266 | 1 6 4 | 6 | 2.54 | 7,942 | 2,012 | 0 16 3 | 319 | 523 | 4 3 | Taurarunui. |
| Tauranga | 2,867 | 8,105 | 2 16 7 | 3,201 | 1 11 4 | 4 | 1.53 | 11,457 | 2,688 | 0 18 9 | 614 | 647 | 4 6 | Tauranga. |
| Te Aroha | 2,429 | 6,331 | 2 12 1 | 3,806 | 1 9 4 | 4 | 1.75 | 4,426 | 1,824 | 0 15 0 | 429 | 606 | 5 0 | Te Aroha. |
| Timaru | 16,480 | 54,300 | 3 5 11 | 17,907 | 1 1 9 | 17 | 1.05 | 19,457 | 5,167 | 0 6 4 | 296 | 2,509 | 3 0 | Timaru. |
| Waikato | 3,440 | 4,747 | 1 7 7 | 2,811 | 0 16 4 | 10 | 2.96 | 5,909 | 2,938 | 0 17 11 | 289 | 690 | 4 0 | Waikato. |
| Waitara | 1,826 | 4,288 | 2 7 0 | 2,535 | 1 7 9 | 2 | 0.94 | 5,044 | 1,636 | 0 17 11 | 925 | 231 | 2 6 | Waitara. |
| Wanganui | 24,394 | 98,146 | 4 0 8 | 34,954 | 1 8 8 | 38 | 1.57 | 14,074 | 8,406 | 0 6 11 | 218 | 7,076 | 5 10 | Wanganui. |
| Whangarei | 6,968 | 25,243 | 3 12 6 | 8,060 | 1 3 2 | 8 | 1.16 | 36,569 | 6,090 | 0 17 6 | 755 | 1,032 | 3 0 | Whangarei. |
| All districts | 526,364 | 1,860,552 | 3 10 8 | 704,120 | 1 6 9 | 794 | 1.51 | .. | 280,361 | 0 10 8 | 353 | 99,645 | 3 9 | All districts. |
| Twelve years' average, whole Dominion | 1,484,970 | 5,366,410 | 3 12 3 | 1,867,912 | 1 5 2 | 4,664 | 3.14 | 1,636,119 | 1,057,132 | 0 14 3 | 227 | .. | .. | Twelve years' average, whole Dominion. |

* Includes statistics for Onechunga, Mount Roskill, and Newmarket Fire Boards from date of inception to date of incorporation in Auckland Metropolitan Fire Board. † Nine-year average. ‡ Twelve-year average. § Ten-year average.

TABLE III.B.—AVERAGE STATISTICS FOR OTHER FIRE DISTRICTS.

| District. | Period of Average (Years). | Population. | Municipal Rates. | Rates per Head. | Insurance Premiums. | Insurance Premiums per Head. | Number of Fires. | Fires per 1,000 of Population. | Highest Fire Loss in any Individual Year. | Fire Loss. | Fire Loss per Head. | Loss per Fire. | Fire Brigade Expenditure. | Expenditure per Head. | District. |
|------------|----------------------------|-------------|------------------|-----------------|---------------------|------------------------------|------------------|--------------------------------|---|------------|---------------------|----------------|---------------------------|-----------------------|-------------|
| Birkenhead | 4 | 3,427 | £ 12,597 | £ s. d. 3 13 6 | £ 4,123 | £ s. d. 1 4 1 | 1 | 0.43 | £ 802 | £ 279 | £ s. d. 0 1 8 | £ 187 | £ 508 | s. d. 3 0 | Birkenhead. |
| Cambridge | 5 | 2,188 | 7,973 | 3 12 11 | 3,207 | 1 9 4 | 3 | 1.39 | 3,175 | 1,538 | 0 14 1 | 506 | 480 | 4 5 | Cambridge. |
| Eltham | 12 | 2,028 | 6,528 | 3 4 5 | 2,574 | 1 5 5 | 3 | 1.68 | 2,672 | 1,071 | 0 10 7 | 314 | 454 | 4 6 | Eltham. |
| Hikurangi | 8 | 1,210 | 2,228 | 1 16 10 | 1,146 | 0 18 11 | 1 | 1.23 | 1,204 | 424 | 0 7 0 | 284 | 219 | 3 8 | Hikurangi. |
| Nelson | 3 | 11,236 | 36,040 | 3 4 2 | 16,329 | 1 9 1 | 12 | 1.04 | 3,924 | 2,262 | 0 4 0 | 194 | 2,194 | 3 11 | Nelson. |
| Opotiki | 7 | 1,331 | 4,012 | 3 0 3 | 2,046 | 1 10 9 | 3 | 2.36 | 3,609 | 908 | 0 13 8 | 289 | 551 | 8 3 | Opotiki. |
| Otaki | 11 | 1,624 | 4,623 | 2 17 0 | *1,884 | 1 3 2 | 3 | 2.07 | 6,659 | 1,461 | 0 18 0 | 435 | 344 | 4 3 | Otaki. |
| Pahiataua | 10 | 1,539 | 4,086 | 2 13 1 | 3,258 | 2 2 4 | 3 | 1.75 | 11,775 | 2,638 | 1 14 3 | 981 | 387 | 5 0 | Pahiataua. |
| Pukekohe | 10 | 2,515 | 12,578 | 5 0 0 | 3,184 | 1 5 4 | 3 | 1.05 | 5,680 | 836 | 0 6 8 | 317 | 672 | 5 4 | Pukekohe. |
| Taihape | 6 | 2,414 | 9,366 | 3 17 7 | 3,726 | 1 10 10 | 1 | 0.62 | 856 | 204 | 0 1 8 | 136 | 527 | 4 4 | Taihape. |
| Te Awamutu | 9 | 1,887 | 9,811 | 5 4 0 | 3,352 | 1 15 6 | 3 | 1.71 | 4,510 | 1,161 | 0 12 4 | 362 | 489 | 5 2 | Te Awamutu. |
| Waipukurau | 10 | 1,967 | 6,142 | 3 2 5 | 3,099 | 1 11 6 | 4 | 1.93 | 7,167 | 1,755 | 0 17 10 | 462 | 339 | 3 5 | Waipukurau. |
| Wairoa | 10 | 2,469 | 10,182 | 4 2 6 | 4,129 | 1 13 4 | 5 | 1.68 | †101,707 | †12,853 | 5 4 1 | 2,571 | 546 | 4 5 | Wairoa. |
| Wellington | 10 | 110,080 | 464,955 | 4 4 6 | 188,255 | 1 14 2 | 184 | 1.67 | 294,070 | 86,642 | 0 15 9 | 471 | 27,975 | 5 1 | Wellington. |
| Westport | 12 | 3,973 | 9,237 | 2 6 6 | 4,270 | 1 1 6 | 5 | 1.34 | 11,989 | 3,331 | 0 16 9 | 624 | 639 | 3 3 | Westport. |
| Woodville | 5 | 1,104 | 2,678 | 2 8 6 | 1,422 | 1 5 9 | 3 | 2.72 | 4,116 | 1,474 | 1 6 8 | 491 | 372 | 6 9 | Woodville. |

* Six-year average. † Fire-loss figures corrected in accordance with returns supplied subsequently.

TABLE IV.—AREAS PROTECTED BY FIRE BOARDS.

| District. | Population. | Rateable Capital Value. | Number of Fire Calls. | Fires involving Property. | Insured Fire Loss, Buildings and Contents. | Uninsured Fire Loss, Buildings and Contents. | Total Fire Loss. | Protected by | Remarks. |
|---------------------------|-------------|-------------------------|-----------------------|---------------------------|--|--|------------------|----------------------------------|---|
| Belfast (works only) | .. | £ .. | .. | .. | £ .. | £ .. | £ .. | Christchurch Fire Board | Payment for attendances. County pays £25 p.a. plus £5 for every call in excess of five. |
| Fairfield | .. | .. | .. | .. | .. | .. | .. | Hamilton Fire Board | County pays £750 p.a. to Fire Board. |
| Feilding (works only) | .. | .. | .. | .. | .. | .. | .. | Feilding Fire Board | Payment for attendances. |
| Green Island | 2,277 | 385,730 | 22 | 2 | 20 | .. | 20 | Dunedin Metropolitan Fire Board | Borough pays £750 p.a. to Fire Board. |
| Hamilton (Hospital only) | .. | .. | .. | .. | .. | .. | .. | Hamilton Fire Board | Nominal payment. |
| Hawera | 600* | 210,000* | .. | .. | .. | .. | .. | Hawera Fire Board | County pays £75 p.a. to Fire Board. |
| Mangere | 760* | 522,000* | .. | .. | .. | .. | .. | Auckland Metropolitan Fire Board | County pays £75 p.a. plus £5 for every call in excess of ten. |
| New Lynn | 3,491 | 636,425 | .. | .. | .. | .. | .. | Auckland Metropolitan Fire Board | Borough pays £100 p.a. plus £5 for every call in excess of ten. |
| Cashmere | .. | .. | .. | .. | .. | .. | .. | Christchurch Fire Board | County pays £300 p.a. to Fire Board. |
| Fendalton | .. | .. | 40 | 9 | 1,200 | 561 | 1,761 | Christchurch Fire Board | County pays £450 p.a. to Fire Board. |
| Riccarton | 11,786 | 3,824,638* | .. | .. | .. | .. | .. | Christchurch Fire Board | Borough pays £450 p.a. to Fire Board. |
| St. Kilda | 7,752 | 1,782,066 | 28 | 7 | 1,159 | .. | 1,159 | Dunedin Metropolitan Fire Board | Borough pays £550 p.a. to Fire Board. |
| West Harbour (works only) | .. | .. | .. | .. | .. | .. | .. | Dunedin Metropolitan Fire Board | Payment for attendances. |
| | 20,666 | 7,360,859 | 90 | 18 | 2,379 | 561 | 2,940 | | |

* Estimated.

Approximate Cost of Paper.—Preparation, not given; printing (2,234 copies), £21 10s.

