

THE ARANUI CONTROVERSY 1962 - 1967

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PREFACE

"It could be argued that even those who take a sceptical view of the study of human behavior but are willing to admit the desirability and the possibility of adding to understanding through case study research may well be distrustful of its value because of its imperfect coverage of the variables in any given administrative situation.....Perhaps only the novelist steeped in administrative experience could capture through that experience and his literary imagination the total picture of the making of decisions....."(Willson 1961 p15)

To a large extent the author agrees with this argument. Yet he lays no claim to having grasped all the variables involved in the Aranui dispute. He has, rather, tried to limit the number of variables dealt with to as few as were necessary to provide a coherent explanation. The political interests of the different parties, for example, could have been discussed but were nevertheless ignored as being not crucial to the understanding of the relationship which developed between the Christchurch Drainage Board and the Aranui residents.

CHAPTER I

OVERVIEW OF THE SITUATION

The city of Christchurch (N.Z.) was initially planned to be a piece of England away from England. On paper, the proposed settlement was to be of not more than one thousand acres in extent with not more than another thousand acres of surrounding suburbs. In 1849 Captain Thomas chose the site: literally a patch of land encompassed by swamps and sand dunes. Not much larger than had been specified by the promoters, Wakefield and Godley, the area selected had only its flatness and its proximity to the Port of 'Lyttleton' to recommend it as the central location of a city.

"The fact is that Wakefield and his associates, in the planning of Christchurch showed the same 'blind spot' which caused so many of their plans to go awry. So obsessed were they by their own ideals for the new settlement that they became oblivious to facts which others of less intellectual capacity might have seen at a glance. How could they hope to restrict the growth of a city? And once their dreams had been frustrated, and the city began to spread seaward, the settlers had to face the absolute necessity of clearing away water from an area, the structure of which was made up of sand dunes alternating with large areas of swamp." (Hercus 1948 p7)

The Christchurch District Drainage Act of 1875 resulted in the election of the first Christchurch Drainage Board in the same year. Lack of drainage and sewage facilities in the new settlement gave rise to serious health problems - outbreaks of disease and a high death rate.

building of a sewage reticulation system and settling basins were accepted. This project was supervised by a sub-committee of the Board and was completed in 1882 in spite of the construction difficulties caused by excessive amounts of sub-terranean water. The settling tanks were built beside the Estuary and sludge from them was used as fertilizer on the Board's property which surrounded them. With the growth of the city another disposal system was established and the sewage was pumped to the Farm to be processed in three large septic tanks. In time the septic tanks became overloaded and during the 1950's the Board had to again embark upon a programme of expansion. This programme strained its resources to the full even though loan moneys were used. Belated extensions to the reticulation system were made and a new treatment plant was built on the old Farm property. The Board was under pressure from many quarters through these years; each quarter alleging some inadequacy, or need, requiring the Board's attention. Between 1952 and 1962 the number of connected premises rose by over 50% to 57,248 (Star 6/7/66).

With the inevitable growth of the city, the land to the seaward side of the site chosen by Captain Thomas was drained and sub-divided for residential use. This three and one half mile wide strip of land was built on: partly because of the shortage of land closer to the central business area of the city, partly because of the presence of employment-providing industries and partly because of the demand for cheap sections. The people who built here were in the main of working class status.

Presumably, when the Sewage Treatment Farm was first established there were no neighbouring residents to complain about any smells in the area. It could be argued that any plant processing sewage will occasionally afflict the surrounding area with unpleasant odours. Breakdowns and maintenance operations might be expected to, at least occasionally, result in the emission of odours. In 1962 the new Sewage Treatment Works was commissioned and it is a fact that since this date urbanization about it quickened. Moreover, the people moving into the area, and the people already resident there, began to complain of intermittent, unpleasant smells which, they alleged, originated at the Works.

The Christchurch Drainage Board was initially set up to deal with particular difficulties facing the early settlers. The proliferation of specialist public bodies seems to have become a pattern in New Zealand government. This fact has, in turn, meant that the formation of resident associations is an almost characteristic feature. People wanting amenities in their district and having to deal with several public bodies have usually concerted their efforts through locally founded committees or associations. Such a body is the Aranui Progress League which was formed in the early 1950's to advance the progressive interests of the residents of Aranui - a district immediately North and West of the new Sewage Treatment Works.

Though the Board had handled its routine business adequately in the past it lacked the established procedures to handle the complaints about the new plant. No doubt the Board's inability to act decisively on this matter was, in part, a consequence of its being composed of

laymen. It employs experts (secretary, engineer, chemist etc.), however, upon whom it depends for technical advice. Indeed, it is likely that these experts will have moulded Board opinion on matters relating to Board business. Sometimes advice will be sought from independent sources, for example, the University (or the Department of Scientific and Industrial Research (D.S.I.R.)).

The University of Canterbury has always maintained close relations with the wider community and has never been unwilling to provide assistance or advice when approached. The Zoology Department, for example, advised the Board on the problem of midge control after the new plant was commissioned.

Any discussion of Board-resident relations must consider the influence of independent experts. It must also consider the impact of comments in the newspapers delivered to the residents.

The people of Christchurch have been served, over the years, by two daily newspapers. Both papers tend to be conservative. They have similar circulations (1960 approx. 60,000) although the morning paper, the 'Press', would have a smaller city circulation than the evening paper, the 'Star'. The 'Press' might be described as solid and respectable in contrast with the 'Star' which might be described as entertaining and community-involved. The Aranui residents, in addition, have delivered to them, free of charge, a bi-monthly newsheet called the 'Pegasus Post'. These newspapers, at least until 1967, were the most important vehicles of public opinion concerning the Aranui smells. They gave the League more publicity than any of the other mass media.

With the Board being criticised by a group of ratepayers alleging the malfunctioning of one of its installations, it might have been predicted that the Board would:

1. consult its own experts,
2. if its own experts were criticised - seek easily available, independent expert advice,
3. if the advice, so far gained, was unacceptable or contradictory - seek overseas expert advice,
4. if the criticism continued - set up a sub-committee to investigate the problem fully.

In the pages that follow, the author will attempt to formulate an explanation of the relationship which obtained between the Christchurch Drainage Board and the residents of Aranui during the years 1962 - 1967.

CHAPTER II

DRAMATIS PERSONAE & GEOGRAPHICAL AREA

A. The Christchurch Drainage Board.

Members of the Board are elected by the residents of the Board's territorial districts every three years. There will be approximately 160,000 electors by 1968. In the past, the proportion of eligible residents who have actually voted has been small (5% 1964 cf. 30% for the City Council 1965). The Board felt that its low polling figures could be explained by the fact that the Drainage Board-Transport Board elections had always been held separately from those for other territorial authorities (City Council, Hospital Board, Catchment Board and Harbour Board). For this reason the Board proposed that all the Christchurch local bodies should have their elections at the same time. The same district divisions, electoral rolls and polling facilities could then be used by all the territorial authorities. This proposal was accepted by all the authorities concerned and the New Zealand Government scheduled the necessary legislation for the 1967 parliamentary sessions. The 1967 Drainage-Board-Transport-Board elections have been postponed until 1968.

The Drainage Board has consisted of fourteen members in the past.

Members are elected on a district basis. And each year, the members elect from their ranks a chairman.

Board members and their occupations as at July 1967:

M.R. Carter	Own building business
G.A.G. Connal	Retired solicitor
J.F. Davidson	Plant engineer - Millers Ltd.
J.K. Dobson	Company manager
T.D. Flint	Business manager
E.C. Leach	Bus driver
A.J. McTainsh	Company manager
G. Ogilvie (Coopted 1967 to replace civil engineer McClelland who moved to Australia)	Civil engineer (Helped construct the new Works)
F.R. Price (Chairman 1967)	Retired school teacher
C.H. Russell	Own plumbing business
R.I.T. Sandford	Fitter
E. Vincent Smith	Retired tailor
R.H. Stillwell	Retired
R.J. Stubberfield	Union organizer

Though Board candidates stand on political party tickets (Citizen, Labour, Independent) behavior at Board meetings tends to be apolitical because of the nature of the Board's work.

The fourteen members staff three standing committees (Finance, Works, Construction & Treatment) and other temporary, specific-interest sub-committees that might be set up to consider such things as tenders, appointments etc. The system of setting up temporary, specific-interest

committees has, over the years, become the set procedure used by the Board to handle contingent issues.

In 1966 the Board resolved that members would receive thirty shillings attendance money: the maximum annual amount not to exceed £78. This meant that the Board was the last Christchurch territorial authority to defray its members expenses. The Board, also, agreed that the chairman should receive an honorarium of £400 (cf. Waimari County Council chairman honorarium of £1,000).

B. The Aranui Progress League.

The league was set up during the 1950's with the aim of working for the benefit and progress of the Aranui district. It has concerned itself with problems which individuals could not manage on their own, such as those involving negotiations with public bodies.

In 1967 the League had 70-80 financial members and was an association and not a corporation. Election of officers was carried out at the annual general meeting by a show of hands procedure.

Officers and their occupations as at April 1967:

Patron	J. Mathison	M.P. for Avon
President	B.R.G. Holmes	Builder
Deputy president & rep. to A.A.P.R.C.*	R. Booth	Clerk of works
Vice presidents	D. Liddell	Grocer

Vice presidents	L. Musson	Hairdresser
	P. Pope	Hairdresser
Auditor	W. Seymour	Clerk
Committee	J.S. Porter	Grocer
	W. Pate	Commercial traveller
	R. Bullen	Engine driver

C. The Geographical Location.

For the purposes of this study the Aranui district is defined as the area between Wainoni Road and Cuthberts Road.* The street map and the aerial perspective which follow indicate the position of the Sewage Treatment Works relative to the residential area from which complaints were received at the Works.

In 1962, when the Works was opened, most of the surrounding land was open farm land. By 1967 the area to the North and West of the Works had been built upon so that houses lined the Northern Works boundary. The area between Bickerton Street and Shortland Street contains some twenty factory sites (Christchurch Regional Planning Authority Map, August, 1966).

The area is generally clean and well cared for. The houses and sections are of State Advances quality: moderate by New Zealand standards.

* See Street Map: E1 & G7

UNFOLD STREET MAP

(Appendix VI.)

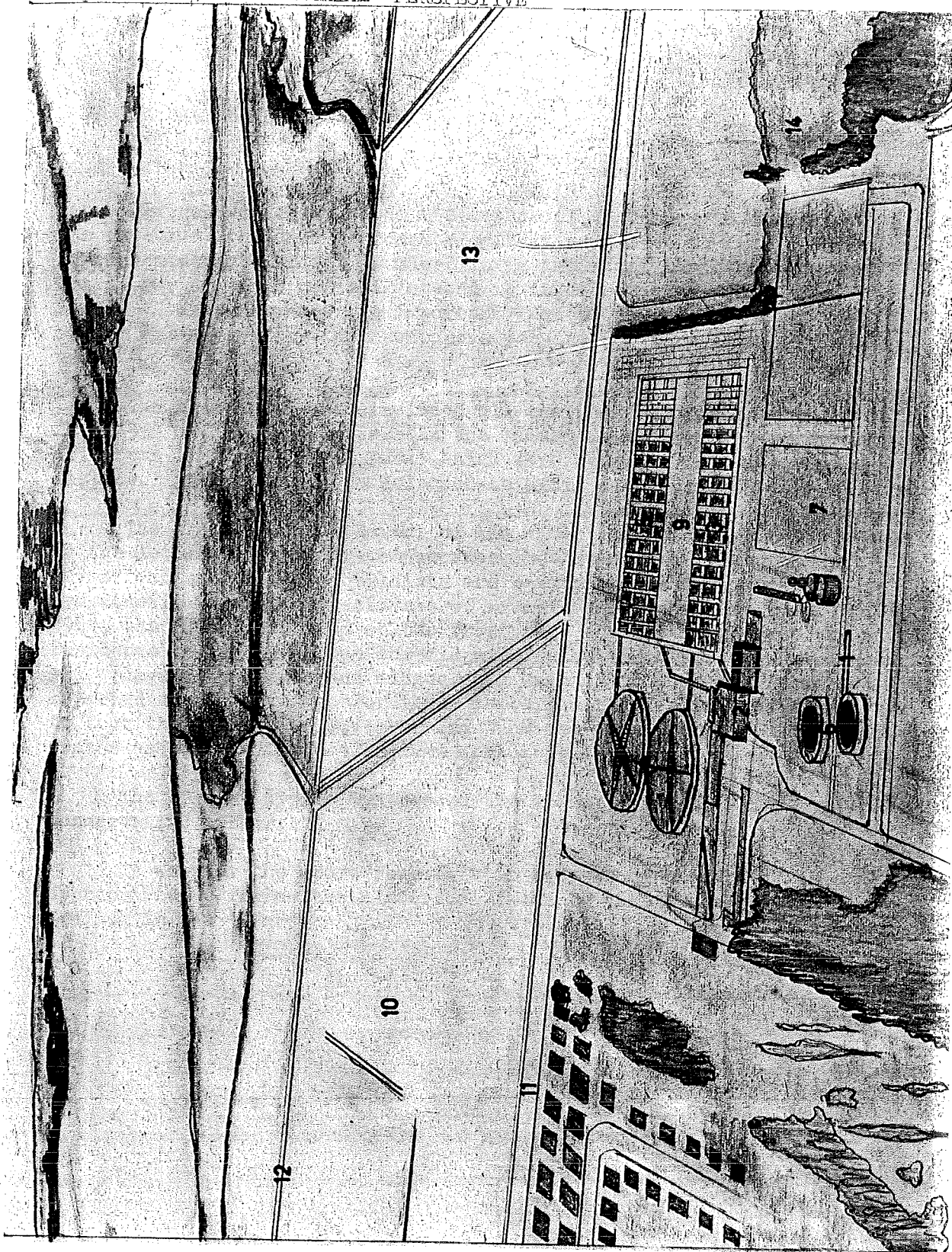
KEY TO STREET MAP

- | | |
|--------------------------|---------------------------|
| * P(s) = Poultry farm(s) | 10. Woollen Mills |
| 1. Sawdust burning | 11. Wire burning & dump |
| 2. Sawdust burning | 12. Unauthorized dump |
| 3. Leather burning | 13. 14. - - |
| 4. School refuse burner | 15. Unauthorized dump |
| 5. Kerrs Reach | 16. Grit manufacturing |
| 6. Timber burning | 17. Animal Home |
| 7. Timber burning | 18. Gelatine factory dump |
| 8. Vanish manufacturing | |
| 9. Plastic burning | |

KEY TO AERIAL PERSPECTIVE

1. Influent structure
2. Operations building
3. Pre-aeration & primary sedimentation tanks
4. Trickling filters
5. Secondary sedimentation tanks
6. Sludge digester
7. Old septic tank
8. High pressure gas storage tanks
9. Future sedimentation tanks
10. Oxidation ponds
11. Cuthberts Road
12. Dyers Road
13. Unused pond
14. Old sludge tank

AERIAL PERSPECTIVE



A PRELIMINARY NOTE TO CHAPTER THREE

References are cited at the bottom of each page to indicate the date and it should be remembered that usually both daily papers carried similar articles. Where it is important that the paper be noted, the relevant paper is stated in inverted commas (e.g. the 'Press' or the 'Star'). Where the important fact to be noted is that the matter was treated by the newspapers per se, the term - the Press - is used.

The news items used included all the news reports in the 'Press' from 1954 on, all the letters in the 'Star' from October 1960 on and all items in the 'Pegasus Post' which were relevant to the Aranui dispute. These data were selected to avoid duplication.

The letters to the Editor of the 'Star' were chosen in preference to the letters of the 'Press' because the 'Star' was more active in investigating readers' complaints and seemingly was considerably more sympathetic toward the residents of Aranui. For example, October 20th 1961, the 'Star' reported on the front page a visit it paid to the residents to inquire about the midge nuisance and stated Pages Road was plagued by stench and midges. On March 29th 1963 the 'Star' reported having arranged for three members of Parliament and a reporter to tour the Works. On November 2nd 1966 the 'Star' allotted 21 column inches as compared with 12 column inches in the 'Press'.

The 'Press' typically treated the Aranui issue in a more conservative manner.

It was for the above reasons that the author thought it appropriate to follow the historical facts in the 'Press' and public feeling in the 'Star'.

CHAPTER III

THE DISPUTE

AS IT HAPPENED THROUGH TIME

By 1954 it had become apparent that the city's drainage and sewage facilities were inadequate. The Board was met with demands for improvements. Things became so difficult that the Board had to send delegates to Wellington to discuss its problems with the Minister of Health.¹ In 1958 the Board called for tenders for the construction of the new Sewage Treatment Works. A tender was accepted and it was said at the time that the contract was for the first stage of a plant designed to cater initially for 300,000 people and eventually for a city of 500,000.²

The course of the construction of the new Works received occasional newspaper comment. It was the biggest earth moving job in Christchurch since the construction of the runways at the Airport.³ The Board had a film made which it felt would be of historical and technical interest to the people of Christchurch.⁴ A park area

1 Press Editorial 21/10/54

2 Press 14/5/58

3 Press 20/5/58

4 Press 18/6/58

next to the Works was cooperatively planned and set out by the Board
 and City Council.⁵

The Chairman of the Board, Mr. Price, said that the insect and
 smell troubles which had occurred at Mangere (Auckland) after the
 opening of the new purification works there would not occur at the new
 Christchurch Works. Mr. Price said that the Board would not have the new
 Works commissioned until all initial difficulties had been overcome.
 The Chief Engineer had visited the Mangere plant regularly to learn
 from the Auckland Board's experience. The Works area, Mr. Price said,
 would be developed into a pleasant place of interest and the Board
 would have the oxidation ponds declared a wild life sanctuary.⁶

In the final stages of construction, the Works was inspected by
 a representative of the designers who declared that the plant was
 something the Christchurch public could be proud of and that the Works
 would be adequate for decades to come. He congratulated the Board on
 its planning and the contractors on their work.⁷

In spite of these public reassurances, as the Works approached
 completion, there were complaints of midges and smells which the
 residents alleged came from the new Works. The Chief Engineer stated
 that the smells were a passing phase.⁸ The 'Star', however, reported
 that the Aranui residents were being plagued by a disgusting stench and
 clouds of midges which were making the lives of those living about the

5 Press 27/5/59

6 Press 17/2/61

7 Press 18/4/62

8 Press 13/10/62

Works a misery. The Chief Engineer replied stating that the smell had been caused by the emptying out of the old septic tanks and was not associated with the new Works. Sludge had been spread out to dry because it was too costly to bury it. He did not expect that the smell would last much longer ⁹ and he apologised for any inconvenience that had been caused to the neighbourhood. ¹⁰

The construction work was finished at the Works. The Press published several articles and photographs with the announcement that the Works was to be commissioned and would be open for public inspection after the official ceremony. It was stated that the plant had been tested for six months and was the most modern of its kind in New Zealand. 11

On opening day the Board's Chemist, Mr. Lambden, was reported as denying that complaints of midges and mosquitoes from residents living on Mount Pleasant, some two miles away from the Works, could be connected with the Works. Mr. Price reiterated that, with the help of the City Council Reserve Department, the Board was determined to make this important part of the Board's undertakings an asset to the city. ¹²

Yet the complaints persisted. The Board had to seek advice from the 'Universiy' about the midge problem and residents complained to the Works staff about smells they thought were emitted by the Works. Contrary to the prevailing opinion, the Mount Pleasant War Memorial Centre expressed the belief that the smell came not from the Works

9 Star 20/10/62

10 Press 22/10/62

11 Press 26/10/62

12 Press 29/10/62

but the Council's rubbish dump - the Board referred this opinion to
¹³
 the Council.

At this time, it seems that even if the residents had not become actually 'anti' the Board the 'Star' had taken sides. The 'Star' had three parliamentarians visit the Works and published a photograph showing them there. This photograph was placed in the centre of the front page with the caption, 'Something Smells'. Miss Howard, M.P. for Sydenham, was shown doubled up clutching a handkerchief to her nose. The members did not reach a conclusion regarding the source of the alleged smells but this did not stop a correspondent to the 'Star' from remarking that the photograph was proof enough of the source of
¹⁴
 the smell.

Symptomatic, however, of growing residential discontent, a local housewife, Mrs. Lucas, and her neighbour, Mrs. McIntosh, initiated a petition to protest against the smells which they believed emanated from the Works. They collected signatures from 500 householders in the area and had Miss Howard present the resulting petition to the City
¹⁵
 Council. This petition might have stimulated the City Council Health Department's report to the Council not long after. The Chief Health Inspector, Mr. Milthorpe, told the Council that providing an adequate spraying programme was continued there would be no further midge nuisance. Further, there had been no smells verified to have been from the Works since alterations had been made at the Works some four months earlier. But several other sources of smell had been traced, for example farms

13 Press 26/10/62

14 Star 30/3/62

15 May 1963:
 telephone conversation

and factories. Miss Howard accepted Mr. Milthorpe's report regarding the midge problem but hoped that the investigation into the problem of the alleged smells would continue. She said that only recently the smells had been as bad as they had ever been. ¹⁶ Mr. Neville, who for one year replaced Mr. Price as chairman of the Board, remarked that the Board had nothing to hide and that it would do all it could to alleviate any smells the Works might cause. Mr. Lambden, however, said that the smells did not come from the Works and Mr. Price said that the smells varied from time to time and originated at different sources. ¹⁷

Whether Mr. Price was right or not need not be the point here - what is interesting is that there are already signs that the Works had gained a reputation as being a source of smells. In a letter to the 'Star', a resident of North Beach compared a fowl farm near his home to the Works. ¹⁸

A breakdown of the No. 1 trickling filter was to create a strong, persistent and continuous odour for several days. According to Mr. Lambden only a few complaints were received at the Works. ¹⁹ The 'Press' reported, though, that the bad smell experienced by residents of Shortland Street had been traced to a breakdown of the filters. ²⁰

Aroused by a situation, that might have been seen as getting worse rather than better, the League met to discuss what could be done about the matter. It was agreed that the members would collect information regarding the smells and the effects of these on house values to

16 Press 17/9/63

17 Press 18/9/63

18 Star 30/10/63

19 Lambden file 19/11/63

20 Press 30/11/63

present to the Board. The League set up a committee, also, to prepare a petition, and the president, Mr. Seymour, told members that if they should smell anything like a sewage plant they should telephone the Works staff to make sure that they, at least, knew the residents had noticed it and did not like it.

During the succeeding month the Board received a letter from a city law firm requesting information concerning the Board's action regarding the smells. The Board replied that it was at all times prepared to investigate complaints but that it would be more helpful if the Board's staff could be notified immediately the smells became apparent. The Board's receipt of this letter was noted in the 'Press'. It was stated that a firm of solicitors, acting for a Shortland Street resident, had informed the Board of a noticeably strong stench coming from the new Works and that the Board had decided to send a 'suitable' reply. A few days later it was reported that the Board would ask the residents for more details before acting.

A 'Star' correspondent, perhaps influenced by the Board's last statement, argued that the smells were generated in the reticulation system and wondered whether or not a good flushing out of the sewer pipe lines would help.

It is clear that opposition to the Board was beginning to crystallize. Faced with continued complaints the Board decided to

21 Press 16/2/64

22 Lambden file
28/2/64

23 Press 18/3/64

24 Star 20/3/64

25 Star 28/3/64

have a wind recorder installed at the Works and it instructed Mr. Lambden to make inquiries as to whether there was equipment which could be bought to keep odour records.²⁶

It has already been mentioned that stench and midge troubles had occurred at Mangere. A royal commission of inquiry had been set up to investigate the situation there. A letter to the 'Star' claimed that the information which Mr. Lambden had given to the Commission of Inquiry about the Christchurch Works was, 'that week's funny story'. The correspondent said that since 1962 numerous complaints had been telephoned to the Works. They had been greeted with, 'there is no smell here'.²⁷ On the preceding Friday the stench had been terrific. Two days later, Mr Seymour, as president of the League, challenged Mr. Lambden's statement to the Commission of Inquiry that, 'except for the first year of operation there had been no complaints of midges or smells from the Christchurch Drainage Board's Sewage Treatment Plant..'. Mr. Seymour said he had spoken to several residents since Mr. Lambden's report had been published and it seemed clear that residents were still ringing the Works staff to complain. He, also, claimed that the smells seemed to disappear shortly after complaints were made.^{*28} A writer to the 'Star' said that it was evident that Mr. Lambden was not a resident of the district.²⁹ A writer to the 'Press' said that there had been numerous complaints and hence the Commission of Inquiry would have been

26 Press 22/4/64

29 Star 28/11/64

27 26/11/64

*That the residents thought there was a valve
*at the Works which allowed the Works staff
to control the smells was a joke at the Works.

28 Press 28/11/64

better served if the residents of Aranui had given evidence instead of Mr. Lambden. A note from the Chief Engineer was printed with this letter, however, pointing out that the evidence which Mr. Lambden had given to the Commission of Inquiry had been mainly related to the oxidation ponds and midge infestations.³⁰

The Works staff received 47 complaints from 35 residents within 15 days.³¹ Of these 47 complaints only 21 were judged, by Mr. Lambden, as being likely to have involved the Works. Seven complaints had been received just before a League meeting - a fact which Mr. Lambden thought the result of the League President's advice, 'If you smell anything which smells like a sewage plant ring them up and tell them about it'.³²

At the next Board meeting, Mr. Davidson told the members that there was justification for complaints. Yet he admitted that he had toured the Works and had not smelt anything obnoxious there.³³ He said if the plant had a defect then this should be fixed; if not, an investigation should be made. For the latter purpose he proposed a committee of laymen. This idea was opposed by Mr. Price (who was again chairman of the Board). Mr. Price advocated an independent investigation and said that the trouble could be caused by the disposal of excessive amounts of liquid into the sewer mains forcing accumulated gas out of the vented manholes.³⁴

A locally distributed notice announcing a League meeting stated

30 Press 4/12/64	31 Lambden file February 1965	32 Lambden file
33 Board minutes 14/3/65 Lambden file		34 Press 14/3/65

that business would include: Smell ex-Sewage Treatment Works and a report on the petition. The notice contained the following paragraph:

"Do you suffer from the smell believed to come from the Sewage Treatment Works? If so be sure to register your complaints by telephoning the Works (Ph. 896 444 - listed in the directory under the Christchurch Drainage Board). Please give your name and address when requested to as we understand complaints are not recorded when residents decline to give this information. In addition, be sure to sign our 'smell PETITION and give YOUR fullest support at the above meeting where this matter will receive further consideration. HELP us to help YOU. See you on March 15." ³⁵

The 'Star' report on this meeting noted that concern had been expressed that nothing had been done since a petition had been presented to the City Council in 1963. Mr. Seymour had said, while speaking about the action the League had taken since Mr. Lambden's report to the Commission of Inquiry sitting at Auckland, that it was obvious that not enough people were telephoning complaints to the Board.

"I have people come and ask me what I am going to do about the terrible smell, they don't make their own complaints. If you smell anything like a sewage plant, ring them up and tell them about it. Make sure that, at least, they know we notice it and that we don't like it." ³⁶

Even while the League was meeting, according to the 'Star', residents were complaining to the Works staff - in fact, a 'Star' reporter, ³⁷ Mr. Dick, had been one of the complainants.

Mr. Davidson said that the Board had not discussed the smells because it had never received any official communications. Miss Howard felt that it was beyond her understanding how a public body could

pretend that there wasn't a smell in view of the complaints which had been expressed through the newspapers. Mr. Davidson promised to investigate the report that smells were experienced shortly before, and one hour after, surplus gas was burnt off at the Works. He said he would inquire, too, whether a similar problem was experienced at other plants.³⁸

Possibly becoming sensitive to mounting public opinion, the Board wrote to the 'Star' to explain that it was as concerned as anyone else about the alleged smells and that it had approached the Department of Scientific and Industrial Research (D.S.I.R.) for a scientific inquiry into the problem. This was reported under the headline: 'D.S.I.R. Aid Involved in Obnoxious Smells'.³⁹

In a confidential report, designed to prepare Mr. Price for talks with the D.S.I.R., Mr. Lambden said that compounds likely to be given off from sewage and cause a nuisance would be sulphur compounds, derivatives of decaying protein substances. A gas chromatograph would be required if the existence of these was to be established objectively. Mr. Lambden pointed out, however, that since September 1963 the District Health Inspector had inspected the Works twice weekly and though he had been asked if there was anything the Works staff could do to lessen the alleged smells he had not required them to do anything.

Mr. Lambden's showing at the Mangere Commission of Inquiry had not been forgotten. Mr Seymour was reported as being amazed that a member of the Board could say that the complaint book had never been tabled.

On the one hand, he said, residents were ringing the Works and being told that their complaints were being recorded, and on the other, Mr. Lambden had told the Commission of Inquiry that the Christchurch Works staff had received no complaints.

At Auckland, the Commission of Inquiry had recommended that the Auckland Regional Authority take new measures to investigate the midge and stench problems associated with the Mangere Purification Plant.

At Christchurch, the Drainage Board members were becoming divided over the smells issue. Mr. Davidson was censured, by Mr. McClelland, for saying that the Board was disappointed with the Works. Mr. Davidson refused to withdraw his remark.

The Board, waiting for the D.S.I.R. assessment of the situation, agreed to keep the League informed. Mr. Davidson recommended that the residents report their complaints through the League to avoid bad feeling and said that he thought the Board would be pleased to have members of the League tour the Works. Another Board member, Mr. Stubberfield, suggested that the League withhold its petition until the Board had heard from the D.S.I.R.

Members of the League did tour the Works. Mr. Lambden guided them around and explained the treatment process to them. He consequently received a letter of appreciation from the secretary of the League and was able to note in his file that no formal complaint had been forthcoming.

40 Star 24/3/65

41 Star 27/4/65

42 Press 27/4/65

43 Lambden file 11/6/65

Several weeks passed and there was still no word from the D.S.I.R. Mr. Davidson asked Mr. Price if anything had come of the resident's request for an investigation. Mr. Price replied that the Government Analyst, Mr. Alcorn, had not yet reported on the matter and that, in the meantime, the Council had been asked for information too.⁴⁴

At the next Board meeting Mr. Davidson tabled a letter which had been written by the president of the Mangere Resident Association to Mr. Seymour.⁴⁵ Mr. Davidson seems to have thought that the letter, which told Mr. Seymour what the Mangere Resident Association had done and what the League should do, reinforced the League's case. Protest meetings, letters to the Prime Minister and Health Department, petitions and pressure for an inquiry were some of the tactics used by the Mangere residents.⁴⁶ Far from seeing this letter in the same light as Mr. Davidson, Mr Lambden felt it constituted proof that the League's complaints had been premeditated and hence were contrived.

Communications between the Board and the Council put Mr. Milthorpe in the position of having to present another report on the Aranui problem to the Council. He said that there was no doubt in the minds of the officers of his department that offensive odour from the Works could be & had been detected outside the Board's property.⁴⁷ Seeing a copy of Mr. Milthorpe's report, Mr Lambden noted that it was at variance

44 Press 23/6/65

45 30/6/65

46 Lambden file
photocopy

47 Lambden file 7/7/65: Milthorpe report

with what the Council's district health inspector had led him to believe and that details had not been given to substantiate the report. In a communique to the Chief Engineer, Mr. Lambden suggested that the Council should be asked for the details that had been omitted from Mr. Milthorpe's report.⁴⁸ The Chief Engineer asked the Council for this information but the Council responded by referring the Board back to Mr. Milthorpe's report.

So the Board was left without data which it thought the Council might have and was still waiting for a response from Mr. Alcorn of the D.S.I.R. The lack of response from the D.S.I.R. had begun to annoy the League. Mr. Stubberfield received a letter which conveyed the League's concern.⁴⁹ Mr. Davidson brought the matter up again at a Board meeting. Mr. Price argued that it could fairly be said that the D.S.I.R. was waiting for information from both the Board and the Council before coming to a conclusion.⁵⁰ The silence of the D.S.I.R. was reported in the 'Press'.

The Chief Engineer again wrote to the Council requesting the data Mr. Milthorpe had omitted from his report. He said that since it was the Board's property that was being inspected the Board would like copies of all past and future reports made by the district health inspector.⁵¹ The council replied advising the Board that it would make

48 Lambden file
7/7/65

49 Lambden file
23/7/65

50 Lambden file
Board minutes
24/8/65

51 Lambden file 1/9/65

its data available to the D.S.I.R. as an independent investigator.

The League had waited long enough. It now presented its petition of 1850 names to the Board. The Board referred it both to its Works & Treatment committee and to the D.S.I.R.⁵² The Works & Treatment committee invited residents to co-operate in tracing the smells. Analysis of the petition indicated that a large number of signatures had come from areas from which the Works staff had never received complaints.⁵³ Data was still being forwarded to the D.S.I.R. and the Board was still waiting for Mr. Alcorn to decide if it called for a full scale investigation.⁵⁴

At last Mr. Alcorn wrote to Mr. Lambden. Noting the evidence he had received from Mr. Lambden, he said he could not, on the basis of this, recommend to his Head Office any practical line of chemical investigation. Interested parties, he suggested, should wait to see what effects, if any, changes the Board contemplated making to the sewer mains in Ottawa, Shortland and Bickerton Streets might have before deciding to act further. In the meantime the recording of complaints and weather conditions should be continued and the Works staff in conjunction with other local body officials might compile a list of all possible sources of smell in the area.⁵⁵

Mr. McClelland moved that the Board adopt Mr. Alcorn's suggestions and set up a sub-committee to implement them. Mr. Davidson, while seconding this proposal, expressed disappointment with Mr. Alcorn's

52 Press 29/9/65

53 Lambden file
Lambden analysis

54 Press 27/10/65

55 Lambden file: letter 21/12/65

statement and asked if the proposed committee could release a statement to the residents to let them know what was being done. Another Board member, Mr. Leach, asked if representatives of the League could be appointed to the committee. ⁵⁶ Mr. Tucker was instructed to advise the City Council of Mr. Alcorn's recommendations and ask if it was prepared to be represented on the proposed committee.

A month later the 'Pegasus Post' reported that a committee had been set up - the article was titled, 'The Smell' . ⁵⁷

Leaflets were distributed again to advertise a League meeting. It was stated that business would include the 'Aranui Smell'. A note said, "If you smell the distinctive sewage odour, please ring the Sewage Treatment Works (telephone 896 444) at once and report it" . ⁵⁸

Stimulated by the embarrassment of continued complaints and with the recommendations of the Mangere Commission of Inquiry in mind, that local bodies should be empowered to buy the land surrounding sewage treatment works, the Board discussed and approved a proposal to buy the land around the Works. ⁵⁹ It also agreed that the League should be invited to send a representative to the new joint committee. Mr. Alcorn and Mr. Lambden were requested to attend this meeting as well

The newspapers reported that the Board had appointed four representatives (Price, Davidson, McClelland and Lambden) to a joint committee to which had also been invited representatives of the League, D.S.I.R. and Council. Mr. Davidson was reported to have said that

56 Lambden file:
Bd. mins. 21/17/65
59 Press 23/2/66

Peg. Post 17/2/66

58 Lambden file
February 1966

the smells were 'pretty atrocious' and could be traced to the trickling
 60
 filters.

The Board instructed Mr. Tucker to write to the chief designer
 of the Works, Dr. Caldwell, stating the facts of the joint committee
 61
 and requesting advice about the trickling filters.

The League seems to have been governed by momentum now. On
 page eight of its flower show programme the problem of the smells was
 again discussed. This would have been prepared before the recent
 Board-League communications for it stated the position was that the
 D.S.I.R. had been asked to undertake a survey of possible sources of
 smell but had not yet decided whether to comply with this request or not.
 The residents were again exhorted to phone the Works. It was noted
 that only twenty residents had attended the last meeting which coupled
 with the wide publicity and poor turnout at other meetings had to be
 interpreted as apathy on the ratepayers' part toward moves the League
 was making in their interest.

Not long after a League notice announced another League meeting.
 It was announced that business would include the 'Aranui Smell' and that:

"Significant progress has recently been made and an opportunity
 for the residents to play a much more vital role in this matter
 has arisen. Be sure to continue ringing the Sewage Treatment
 Works (telephone 896 444) when the distinctive odour is smelt."⁶²

Hard after this meeting of the League came the inaugural meeting
 of the Joint Committee - to be called: The Aranui Air Pollution Research

63

Committee (A.A.P.R.C.) - Mr. Alcorn was elected chairman. Following the inaugural meeting of the A.A.P.R.C. Mr. Alcorn and Mr. Price visited the Department of Psychology and Sociology at the University to discuss the feasibility of a public opinion survey. At the University they met Dr. R.A.M. Gregson, an expert in the psychology of olfaction.

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At the next Board meeting, Mr. Davidson moved that a full report of the negotiations with the Council for the data which the Chief Engineer had twice before requested be tabled at the next meeting of the Board.

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This was possibly more politic than necessary because, since the Council had refused the data last, the Works staff had been duplicating the District Health Inspector's reports. The data in which Mr. Davidson was interested was no longer recent enough to be of much use. Mr. Tucker, however, writing to the Council, outlined the developments on the smell problem since 1965 and expressed concern over the Council's reluctance to give the Board the data which the Chief Engineer had requested earlier. Mr. Tucker said that he had been directed to make a formal application for this data.

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Some time was to elapse before Mr. Milthorpe was to respond to this application.

In the meantime the Board received advice from Dr. Caldwell who said that, from his own observations and from discussions with Mr. Lambden, he was confident that the trickling filters were not a source of odour. It is not uncommon, he said, to find a sewage treatment

63 Lambden file
21/3/66

64 Foddy file

65 Lambden file
26/4/66

66 Lambden file 30/6/66

works blamed for odours which, upon analysis, were found to have their origin in a nearby industry or other source.⁶⁷

Within this period the Board was having to consider and approve extensions to the Works. This fact excited criticism from a Board member, Mr. Flint, who said that in 1962 the Board had been told that the Works would be adequate for decades to come.⁶⁸

Again the dispute exhibited signs of poor communications between the participant parties. The 'Pegasus Post' printed a letter from a Liberal Party representative who asked 'how long the D.S.I.R. would dally and how long the Board's Chemist would be so enamoured with his new toy that he could not believe it could be a nuisance'. The writer argued that lack of atmospheric ventilation coupled with inversion effects were part of the bother.⁶⁹

Mr. Milthorpe finally reported to the Board. He stimulated Mr. Davidson to accuse his Board colleagues of having adopted an 'ostrich-like attitude' in not admitting the smells in the Aranui area came from the Works. He said Mr. Milthorpe's report bore out what he had been saying for the past sixteen months. Residents, he said, had bought homes in the area for three to four thousand pounds and he doubted if they could sell them for two thousand pounds.⁷⁰

A fact which becomes increasingly clear is that both Mr. Lambden and Dr. Caldwell were coming to be seen, by the residents, as barriers to action. A Pegasus Post correspondent said that both were still

67 Star 7/7/66

68 Press 16/7/66

69 3/8/66

70 Star 24/8/66

denying that the Works smelt. The correspondent said that the Board should accept its responsibility and use all its resources to track the smell down: it would have ample opportunity during the warmer months ahead. The special committee which had been set up, the correspondent complained, had only met once in five months: the residents deserved
71
better.

So the problem of the smells was far from being a dead issue. A 'Star' report said the 'Aranui Stench' again results in complaints, and Mr. Lambden was quoted as saying that the stench, on occasions, was really caused by residents burning high sulphur content coal. Several residents' opinions were reported. Mr. Neary, speaking on behalf of the Clean Air Society, said that it was a disgrace that in a major city like Christchurch such a situation should have existed for
72
three years.

Yet, not all the residents disagreed with Dr. Caldwell and Mr. Lambden. W.E. Davies, in a letter to the 'Star', contended that the smell in the Aranui district came, not from the Works but, from
73
polluted mud in the Estuary. Mr. Seymour, however, said Mr. Davies had written nonsense.
74
And Mr. Holmes, who had replaced Mr. Seymour
75
as president of the League, also took exception to Mr. Davies' view.

The dispute was moving into a new phase. The Clean Air Society suggested to the League that both bodies should hold a joint public
76
protest meeting to register their common concern over the smell nuisance.

71 Pegasus Post
11/9/66

74 Star 1/10/66

72 Star 22/9/66

75 Star 3/10/66

73 Star 29/9/66

76 Early November

The situation was still a little unstructured, though; - a 'Star' correspondent again advanced the view that the smells came from the sewer mains ⁷⁷, a second said that smells from the Estuary were totally different from those originating at the Works which were sometimes so nauseating that it was difficult to breathe ⁷⁸, a third 'Star' correspondent agreed with the second ⁷⁹, and a fourth said the Board had taken steps to shift the smell to an adjacent residential area but did not explain this contention ⁸⁰.

Amidst the heightening interest, the Pegasus Post claimed the sewer stench season would soon arrive. A photograph showed a sand tray which, the article said, was one of many being used to deaden the smells from the manholes. ⁸¹

At a second meeting of the A.A.P.R.C., Mr. Alcorn said that there appeared to be three lines of investigation: (1) a survey to establish the frequency and severity of the smells experienced by the residents, (2) use of the gas chromatograph just purchased by the Board and (3) the erection in the area of the recording instruments used by the Christchurch Air Pollution Advisory Committee 1959 - 66. The League's representative, Mr. Booth, suggested that observers be employed in the same way that observers had been employed at Mangere. Dr. Gregson, who had been invited to attend this meeting, said it seemed to him that

77 Star 6/10/66

78 Star 10/10/66

79 Star 14/10/66

80 Star 17/10/66

81 Pegasus Post 18/10/66

much of the Committee's problem arose from semantic factors. He offered to train volunteers to be able to make standardized observations.

Mr. Booth asked if the League could be informed about what was happening.

The Committee authorized Mr. Alcorn and Mr. Tucker to prepare a 'suitable' statement for the Press. It was agreed that the Council's Health

Department should be invited to nominate a representative to the Committee. 82

The League and Clean Air Society distributed notices advertizing the proposed joint protest meeting. The leaflet stated;

"This smell problem concerns YOU and YOUR property. No further delays in efforts to solve it can be permitted as even now the Drainage Board is making preliminary moves to extend the Sewage Treatment Works which could result in more smell more often and even more misery for local residents. The Drainage Board has been allowed to 'pigeon-hole' this matter for too long. They have done virtually nothing about it. Some Board members and senior Works staff won't even admit any smell comes from the Works. But YOU know better than that. Let's fight this all the way! JOIN THE CAMPAIGN TO ERADICATE THE SMELL." ⁸³

The meeting was also advertized among the public notices in the Press. The notice began, 'Stand Up and Speak Out Now'. 84

Consequently, approximately 150 residents met to be addressed by six speakers (the presidents of the League and two clean air societies, the M.P. for the district and his political opponents). The most important outcome of this meeting turned out to be the passing of a motion put by Mr. Mathison, the M.P. for Avon, that:

"This representative meeting being concerned at the continuing objectionable smells in the Aranui, Wainoni and Bromley district support the Aranui Progress League in its discussions with the

82 Foddy file, Comm. min.s 27/10/66

83 Lambden file

84 Press 1/11/66

Christchurch Drainage Board and suggest that the League should issue notice to the Board that if it has not taken steps to eliminate the cause of the smell within six months, the League be empowered to seek a writ in the⁸⁵ Supreme Court to compel the Board to take appropriate action."

Following the protest meeting the League distributed a notice announcing a meeting to decide what action should be taken to implement the above motion. The notice stated:

"Now the time is approaching when the evidence of the 'Aranui Smell' will increase sharply, it is most important that YOU register YOUR smell complaint with the Sewage Treatment Works. The Works telephone number is 896 444. Keep this number handy and be sur⁸⁸ to phone them when the smell is prevalent in YOUR street."

A few days later the 'Star' commented on the League's activity and on its replies from the Prime Minister and Leader of the Opposition. 88

At the same time as the League was thus active the A.A.P.R.C.'s investigation programme was beginning to move. Dr. Gregson wrote to the secretary of the A.A.P.R.C. (Mr. Tucker, who was provided by the Board) confirming that he could begin screening volunteers to be used as smell wardens. ⁸⁹ He had preliminary instructions issued to the people whose names had been forwarded to him by the League. Of the 15 original volunteers ⁸ gave excuses as to why they could no longer undertake training and one failed to turn up to her first appointment. Eventually 9 women attended the University for training. The Board had agreed to share on a 50/50 basis with the Council the cost of training ⁹⁰ 20 people.

85 Attended Foddy

86 Lambden file

87 Attended Foddy

88 Star 30/11/66

89 Foddy file
23/11/66

90 Foddy file

The scheme to have wardens at 'six pounds a nob' was derided by one resident who said the Aranui people 'knew where the smell came from'.⁹¹

The Pegasus Post reported that residents whose faces were taking on a somewhat pinched look through being obliged to hold their noses might take small comfort from the fact that councillors Smith and Pickering had been appointed to the A.A.P.R.C.⁹²

Mr. Neary, the spokesman for the Clean Air Society, and Board member Mr Leach were to have a minor clash. Mr. Neary, writing to the 'Star', said that Mr. Leach was falling over backwards to be fair to the designers and operating staff of the Works.

"The Sewage Treatment Works cannot emit odours because they were designed by experts and operated by specialists! The typical odour has been reported as far away as Richmond and Latimer Square * and is sometimes as lively as a well-behaved tannery"

Mr. Leach countered and Mr. Neary replied by refuting an implication made by Mr. Leach that his interest in the Aranui problem was not entirely public spirited. Mr. Neary said he had been brought into the dispute when Mr. Lambden had told a complainant that offensive odour had been often the result of residents burning high sulphur content coal.⁹³

Behind the scenes, Dr. Gregson had completed his undertaking for the A.A.P.R.C. He reported the results of the training sessions to Mr. Tucker and informed Mr. Tucker that the preliminary results of a survey of public opinion in the Aranui district made by the author would

91 Star 16/12/66

92 17/2/66

93 Star 28/12/66

* Some three miles away

94

be available for the next A.A.P.R.C. meeting. At this next meeting, the author told the members that more residents than had actually complained had said that they had been bothered by the smells. He said that whether or not the Works was a source of odour was not the real problem - the fact remained that the residents thought it was. The author made the comment, also, that the Board and Works staff were seen by the residents as having not discussed the problem freely enough.

Still active on the problem, the League had its solicitor convey to the Board the possibility of a court action if there was no abatement of the alleged smells within six months from the time of the protest meeting. Mr. McClelland reacted to the League's action by declaring that the League was being used for cheap political advantage.

Mrs. Lucas wrote to the 'Press' deploring the way the petition which she and a neighbour had initiated in 1963 had been shelved and the way the National Party Board members had been content to ignore the problem.

In response to Mr. Lambden's having categorized 27 of 83 complaints, received for the preceeding month, as possibly the result of the Council's rubbish dump, Mr. Mathison and Mr. Stubberfield inspected the Council's dump and both agreed that it was not the source of bother, Mr. Stubberfield, however, remarked that the way residents spoke to the Works staff over the telephone was often disgraceful. The Works, he said, was not the only possible source of smell in the district.

The situation was beginning to crystallize. The A.A.P.R.C.

94 Foddy file

95 Press 1/3/67

96 Press 2/3/67

97 Press 6/3/67

*i.e. Citizens - local body level
National Party - national level

deliberations were beginning to influence the course of events. A Board member argued that the Board ought to seek overseas advice. Mr. McClelland suggested that the Board ought to improve its public image and invite residents to tour the Works.

Mr. Booth told the League that the smell from the trickling filters was the real bone of contention, 'and that any other smells were just red herrings'. Mr. Stubberfield told the League that he was certain the filters were the source of the smells. One League member said that motorists sped along Cuthberts Road, past the Works, because of the smell.

An interim report was released, by the A.A.P.R.C. to the Press, which mentioned the various approaches the Committee had been using. Dr. Gregson took exception to a comment made in this report to the effect that the gas chromatograph constituted the most scientific approach. None of the chemical information that was being collected, he said, would have the slightest relevance to the solution of the Aranui problem unless it was clearly and directly linked with human experiences.

Dr. Gregson and the author attended a meeting of the A.A.P.R.C. to answer, or clarify, any points which the members wanted to raise concerning their final report which had been submitted to Mr. Tucker a few weeks earlier. The committee agreed to release this report to the mass media on the day of the next Board meeting when it would be tabled for Board discussion. The general conclusions reached by

98 Press 29/3/67

99 19/4/67

100 29/4/67

101 Press 2/5/67

102 13/7/67

Dr. Gregson and the author were:

1. Opinions and evidence gathered from respondents, the Christchurch City Council Health Department and by the University would seem to indicate that bad smells, which are predominantly believed to come from the Sewage Treatment Works (or vented manholes) do trouble the residents of the Aranui area. More people than those who have communicated with the Sewage Treatment Works staff have been bothered by bad smells.
2. Whether the odours are evaluated by residents in a manner congruent with the physical stimuli intensity levels is another problem. It would appear, however, that evaluations are made more extreme by perceived lack of communication from the Christchurch Drainage Board and perceived lack of action on the Christchurch Drainage Board's part. The Christchurch City Council Health Department inspectors have stated in interview that the smells are not as bad as some of the residents would claim, yet, they agree that the residents are troubled by smells. If the residents are in fact troubled by smells, the Christchurch Drainage Board would do well to realize that its denying the existence of a problem results in resident reaction rather than resident acquiescence.
3. The General Situation is characteristically one containing several parties lacking a coherent communications system and not always agreeing on what role each should be playing.

The Board accepted this report, discussed ways of dealing with the trickling filters and agreed to seek the League's interest and support. There was no doubt that there were other sources of smell in the Aranui area, one member of the Board said, but the Board would do its utmost to reduce any contribution the Works made to these smells. 103

The 'Press', the 'Star' and the New Zealand Broadcasting Corporation reported the latest developments. A 'Star' editorial stated that:

" ... For seven years the vexed question of whether, or not, there are smells and, if so, whether they come from the Board's Sewage Treatment Works, has been debated endlessly and, occasionally,

acrimoniously. In the past, residents have been frustrated by the apathy and negative attitude of the Board..... Some public bodies would have been only too ready to keep such a condemnatory report private, and to have confined subsequent discussion to committee debate. It is a mark in favour of the Board's policy of keeping the public informed that this was not done..... The Board's sensible reaction, sparked though it was by outside pressures, should be noted by other public organizations." ¹⁰⁴

Mr. Holmes, speaking for the League, welcomed the Board's decisions and said that the League would willingly cooperate with the Board. ¹⁰⁵

POSTSCRIPT

Note on the Smell Wardens

During December 1966 and January 1967 nine volunteers were trained, under Dr. Gregson's supervision, for the A.A.P.R.C. In a preliminary investigation, these volunteers were required to record observations made on two days in February and two days in March 1967 - results indicated that this line of inquiry was promising. The A.A.P.R.C. had Dr. Gregson design another investigation which was eventually conducted in June using five of the nine observers who could be driven about the Aranui district to make observations at several pre-set points. Possibly because it was winter, the women did not observe any smells throughout this investigation and subsequently expressed the fear that they might only be going to be used when the smells were not, in fact, prevalent. Mr. Tucker, on behalf of the A.A.P.R.C., however, was stimulated to ask Dr. Gregson if more volunteers could be trained to allow a more ambitious study possible during the warmer 1967-8 months.

In spite of the consequences of the Gregson-Foddy report* the University did train further wardens and it appears at the time of writing that the A.A.P.R.C. investigations proposed for the 1967-8 summer months will still be carried out.

* i.e. as mentioned pp 38-39

CHAPTER IV

WERE THERE SMELLS?

The situation in the Past.

In the first instance, this study was directed toward collecting information which would be of use to the A.A.P.R.C. and Christchurch Drainage Board. The first question to which an answer had to be provided was the practical one: were there smells? As this chapter will indicate, there is no conclusive way of answering this question. A soundly based answer will require physical, chemical, psychological and sociological evidence. It is important that this argument be accepted, since, from the standpoint of this study, the question asked has special significance. A research worker trying to understand the dynamics of a social system has to be able to say what, in the Weberian sense, is social action and what is non-social action (see Coser & Rosenberg 1957 p76). Aranui residents might have been bothered because others in the district told them that smells were emitted from the Works or because they had noticed smells themselves and decided for themselves that these could only have come from the Works.

An answer to the question posed is required if the Aranui dispute is to be classified as either the result of social factors or the result of physical factors.

There is reason to believe that residents of the Aranui district have always been troubled by smells. The Christchurch Air Pollution Advisory Committee's 1966 report states that pollution of the Estuary and lower reaches of the Heathcote river has made both likely sources of obnoxious odours and that botanical research on plant life in the Estuary has indicated a reduction of seaweed growth since the Works was commissioned. The odour of decaying seaweed had, on several occasions during the preceeding years, been the source of nuisance.

A Doctor's wife told the author that there had been smells in the Aranui district ever since she could remember and she had lived in the district for eighteen years. Mr. Mathison told those who attended the joint protest meeting that the smells had been worse before the new Works had been opened.

There may, then, have always been smells in the Aranui district yet for the purposes of this study it is, perhaps, more important to assess the state of affairs that obtained after 1962. We can begin by noting that there have been six occasions when the Board admits the Works has been a source of unpleasant odour. The Christchurch Air Pollution Advisory Committee and A.A.P.R.C. were both supplied with the details relevant to these occasions:

October 1962 Contractor spread sludge from old septic tanks.

March 1963 Unused pond partly filled to drown weeds.

November 1963 No. 1 filter broke down.

Note that the complaints are more frequent during the summer months and that they become more frequent each year. Moreover, since the events, which the Board admits might have excited complaints, all occurred during summer months, a relationship between them and the complaints cannot be inferred. The fact that the complaint rate increases markedly each year, however, is evidence that the complaint behavior became institutionalized.

In all, only .48% of the Aranui residents (approx. 3300 in 1966) complained to the Works staff directly and less than one half (49%) of the households, in the streets canvassed, were represented in the League's 1965 petition.

Discussion of the Survey Results.

The above complaint rate could well have been considered to be insignificant, especially when the League's advertizing efforts are kept in mind. Indeed, Mr. Lambden, and consequently the Board, happened to view the complaints as having come from a minority. Some of the survey data are pertinent here. Though those who complained to the Works staff were in the minority, the great majority of respondents, when asked if they had been bothered by bad smells in their area, said they had. At the 95% confidence level, this means that between 2280 and 3070 of the 3300 householders would say that they had been bothered by smells. Similarly, between 1120 and 2080 would say that the Works was a major source of smell. A more detailed analysis of the survey data relevant to the question, 'were there smells?' follows. The details of the survey design and the full analysis may be found in the appendix.

Of the 104 respondents, 50 complainants and 41 non-complainants said that they had been troubled by air pollution and, when asked specifically about bad smells in the air, 48 complainants and 43 non-complainants said that they had been troubled both by air pollution and by bad smells specifically. The evaluations of intensity and qualitative character of the smells, however, differed between the complainants and the non-complainants.

The smells were:

	Very unpleasant	Quite, or not noticeably unpleasant
Chronic complainants	27	2
Moderate complainants	23	5
Non-complainants	21	24

$\chi^2 = 20.41$ d.f. 2 Sig. .001

Twenty complainants and 26 non-complainants reported noticing air pollution when they moved to the area. Twenty-one complainants and 13 non-complainants said that they thought air pollution had got worse since the new Works had been opened. Ninety-one of the 104 respondents mentioned the Works as the major cause of air pollution - 61 mentioned it alone. Only 4 mentioned the Estuary, 2 the old treatment plant site and 10 indicated that they had no idea as to the source of the alleged smell.

Thirty spontaneous comments made by respondents (20 of whom were non-complainants) put the blame on the Works but implied that the smells were neither intense nor very noticeable (e.g. 'not bad here', 'occasionally', 'troubled by a smell once'). Twelve spontaneous

comments were less moderate (e.g. 'this week worst since came', 'getting worse').

If the complaints had been stimulated by League pressure, rather than objective atmospheric conditions, this fact should be apparent in the relevant survey data. To questions asking what weather conditions had been concomitant with the smells, no general agreement was apparent. Fifty five respondents volunteered 'wind direction' as important, 14 hot or calm conditions, 3 cold or frosty nights. The notion that the residents had agreed to 'push' one line, rather than another, is not supported by the data. Instead, it seems that the residents did not pay much attention to the weather conditions. Further, it is interesting to note that neither the complainants nor the non-complainants had much idea how to instigate action on a community problem. Men whom respondents saw as being able to do something were:

	M.P.	League men	Neighbours	City councillors	None d.k./n.a.*
Complainants	10	6	6	2	28
Non-complainants	11	7	7	0	27

Thus, it appears that there was no general agreement reached among the residents as to what they should do. When asked if they had ever complained about some aspect of their area to the newspapers, Works staff, Council or M.P., respondents gave the following responses:

* = don't know & no answer

	No complaints	Complaints to Works staff	Other
Complainants	11	38	3
Non-complainants	45	1	6

Note that a proportion of the people whose names were filed at the Works did not communicate to the Works staff intending to complain but to help the Board and its staff in their investigations. This should have been expected as the Board was on several occasions reported in the Press as wanting the residents' cooperation.

The Aranui Progress League appeared to be associated with the pattern of complaint behavior:

Source of information:

	Newspapers/T.V./friends own observations	League
Complainants	28	24
Non-complainants	38	13

χ^2 df 1 Sig .05

Familiarity with the League:

	Unfamiliar	Familiar/very familiar
Complainants	19	33
Non-complainants	36	16

χ^2 df 1 Sig .001

Yet, a sense of contributing to community decisions was not related significantly with the League (χ^2 sig. .1) And organization membership was not related to complainant behavior (χ^2 sig. .98) or evaluation of the alleged smells (χ^2 sig. .75).

The conclusion that the survey data would seem to support, then, is that: while the League was related to the complainants' behavior, the perception of the situation shared by League members and followers was too similar to that held by the residents in general to argue that complaints were stimulated by organizational factors alone.

The Way Mr. Lambden Evaluated Complaints received at the Works.

Of the 560 complaints received at the Works, Mr. Lambden classified 281 as possibly legitimate. The other complaints he graded as coming from localities too distant from the Works, out of the windline or as being unsubstantiated either because the smell complained of had been found to be insignificant or because it had been found to be non-existent.

Discussion of Unsubstantiated or Insignificant Complaints.

A complaint which Mr. Lambden and the author investigated together (Nov. 1966) was possibly a typical case. A telephone call was received from a portion of Shortland Street which is within sight of the trickling filters. Even though the area was, perhaps, 30° out of the windline from the Works (Wind SSE and gusty), faint whiffs of smell - very like the odour experienced immediately alongside the filters - could be occasionally detected. While Mr. Lambden contended that the smell was insignificant, the author thought that it was strong enough for an unsuspecting person to have noticed.

Mr. Lambden's tendency to evaluate any alleged smell as either insignificant or non-existent was possibly determined by two facts. Firstly, it did not occur to him that a faint smell could be legitimately

called 'vile' - this is the problem of qualitative versus quantitative judgment. Secondly, adaptation effects might make it difficult, or impossible, for people to detect the filter smell when they have just come from the Works. The District Health Inspector, for example, said that he was often unable to notice odour on his way from the Works that he had noticed when arriving. Three facts are important here: (1) human-beings exhibit remarkably little sensitivity to changes in an odour stimulus intensity, (2) observers seem able to make, at best, about three intensity judgments - weak, strong and very strong (Gregson - work for the A.A.P.R.C. 1967) and (3) olfactory fatigue is selective and individuals take time to recover from adaptation effects (Moncrief 1951). These facts support the contention that Mr. Lambden may well have been an unsuitable person to have had investigate the complaints: as would any other person employed at the Works have been.

Olfactory detection thresholds for humans are quite low. For some substances, such as sulphur compounds, they are very low. Unfortunately, there are few facts and figures available in the literature on olfaction. It may be that the mere fluctuation of odour stimuli can be distracting, and hence, unpleasant. Again past experience might cause individuals to evaluate certain smells as 'unpleasant'. In the case of some odours intensity does not have to be much more than the detection threshold to be called strong (e.g. H_2S - Gregson, A.A.P.R.C 13/7/67). The residents might well have been disturbed by 'insignificant' smells.

Discussion of Cases Judged Out of the Windline.

Many of the complaints that Mr. Lambden classified as illegitimate were classified so because

he judged them to have come from out of the windline from the Works. Generally, working on the assumption that air currents are necessary to transmit a smell from one place to another, the residents of Breezes Road, Tomrich Street, Shortland Street and Ariel Place should have been troubled when the wind was SW or WSW. According to advice Mr. Lambden received from the Christchurch Airport Meteorological Office (mid-1965) the SW and WSW winds are predominantly winter winds in Christchurch. Yet, the residents had complained most during the warmer summer months when the wind was typically from the sea (E) or from a NW quarter.

Because Mr. Lambden perceived some residents to be applying an inversion theory that had been advanced at Mangere, he sought advice from the Meteorological Office regarding the likelihood of atmospheric inversion effects occurring about the Works (Sept. 1966). He was informed that inversion effects do not occur in Christchurch during the summer months when the residents had tended to complain most often. If inversion effects did, in fact, occur, it could be argued that smells would rise from the filters to a certain height to be noticed by residents living in areas at the same height above sea level as the inversion ceiling. However, since the land about the Works happens to be reasonably flat, inversion effects, even if they did occur during the summer months, would not affect the likelihood that residents would be afflicted by smells. Smoke experiments, which Mr. Lambden conducted (Sept. 1966), indicated that air currents do not rise from the filters but move across them and then along the ground.

Mr. Lambden thought that if odour stimuli were emitted from the filters, an observer would find that the smell was more intense the nearer he was to the filters. To postulate that any odour stimuli would travel with the wind, in a plume of ever increasing cross-section and decreasing concentration, is not unreasonable (see Sutton 1947). Mr. Lambden has frequently insisted that the smell from the trickling filters is normally not noticeable at more than 120 feet downwind from them. But residents have complained at distances as great as one to two miles from the Works. Should odour stimuli travel in filaments of almost constant concentration (see Wright 1964 p13), then, residents one to two miles from the Works might well detect smell from the filters of the same strength as that noticed much closer to them.

Mr. Milthorpe (A.A.P.R.C. 13/7/67) has argued that Mr. Lambden's method of classifying complaints was too gross. Direction had often been ascribed to wind conditions also described as calm and it has been these cases which have been typically judged to be out of the windline from the Works. Coupled with diffusion effects, calm conditions may mean that areas quite a number of degrees out of the windline could have been afflicted with odour stimuli.

Clearly Mr. Lambden's notions about the way odour stimuli could be emitted from the Works were too simple. One might assume that the way in which gases disperse from a sewage treatment works would be influenced by the nature of the gases (temperature, density etc.) and whether, or not such gases react chemically with components of the atmosphere (see Beardsley, who uses this idea to explain experience at a sewage treatment Works in Los Angeles. 1954 p68).

Other Investigations Mr. Lambden Conducted.

In addition to his interest in air currents, Mr. Lambden investigated certain operating characteristics of the trickling filters. Arguing that the level of bacterial activity in the filters was a constant (which would not have been the case for either the Council's dump or the Estuary), Mr. Lambden nevertheless kept records of the level of dissolved oxygen in the filter effluent (to make sure that the filters never became anaerobic i.e. putrifying) and the temperature of the fluent as it passed through the filters.

For reasons which he could not clearly explain, to the author, Mr. Lambden thought that since the filters ran at a virtually constant temperature, any odour stimuli emitted would have been emitted when the temperature difference between the filters and atmosphere was zero. Working with this idea in mind he was not able to find a relationship between the temperature records and the complaint pattern. This is not very odd since it seems more logical, to the author, that odour stimuli would have been emitted from the filters when the temperature differential between the filters and atmosphere was greatest. On the one hand, in cold weather fluent trickling through the filters would have warmed the air beneath the filters which would have risen through the filters dragging odour stimuli with it, while on the other hand, in hot weather, fluent trickling through the filters would have cooled the air above the filters which would have sunk through the filters dragging odour stimuli with it. In fact, the residents did tend to complain most during the warmer weather and

the District Health Inspector says that the worst smells that he experienced about the Works occurred in frosty weather. Perhaps fewer complaints were received during the winter months because of decreased physiological sensitivity on the part of the residents, or because doors and windows were kept shut. Relevant to the first suggestion, Mitchell (1967) found that environmental temperature changes accompanied within subject variation for olfactory detection tasks (sig. .0001 level): when 'cold' subjects were allowed to sit in front of a heater to 'warm up' within subject variation was no longer important.

Evaluation of Mr. Lambden's Investigations.

Asked about his investigations, Mr. Lambden explained that he had looked at the physical variables which he had felt might be related to the pattern of complaints received from the residents. All his findings had been negative. This is important since it is postulated that Mr. Lambden would have been a major factor behind the Board's attitudes and yet telling criticisms can be levelled against his data and interpretations.

Communications With the Mental Hospitals.

While interviewing a sample of Aranui residents, the author noticed that more of those who had complained, than those who had not, displayed signs of skin diseases or irritability. If smells had made living conditions in the area really intolerable, one might have expected a higher incidence of nervous complaints in the area than found in other more congenial residential areas. Communication with the mental health units in Christchurch disclosed that during early

1967 three people (from Shortland Street, Tomrich Street and Ariel Place) had been admitted to Sunnyside Hospital. The Doctor in charge of these patients, however, felt that their admission reflected more the facts that they were, all three, Dutch immigrants and acquainted with a fourth, possibly paranoid, resident who had spread rumours and gossip about the patients, than stress caused by environmental factors. A nurse felt that the patients had been more depressed by the physical features of their area and by the unlikeliness of ever being to sell their properties than by atmospheric conditions in their district.

Evidence From the University.

Some interesting facts emerged from the A.A.P.R.C. smell warden training sessions conducted at the University. As part of their training the trainees were required to describe five complex, unknown (to them) odours, one of which was a sample of the filter effluent, in terms of ten standard odours. It was found that the trainees described the effluent (as putrid) as reliably as they could recognise the standards they had been trained to recognise. Moreover, even though the trainees were instructed to use only standard terms to describe the unknown odours, three or four spontaneously called the effluent, 'the Aranui smell'. Hence, it could be argued that the observers had most likely experienced the effluent smell in the past. In the field, the wardens did report the presence of putrid smells on one of four observation days.

General Discussion.

Any modern urban area suffers to some degree from

air pollution, be it fumes, smoke, dust or smog. Noticeable smells in any urban neighbourhood are neither rare nor surprising. People adjust to such troubles usually and accept them as facts of city life. Normally, smells will be either ignored or, because of adaptation factors, unnoticed. Sewage treatment works, however, belong to a class of facilities that attract attention because they have negative associations for people. Dr. Caldwell was possibly correct when he said that it was not unusual for sewage treatment works to be blamed for odour emitted from nearby industries. Thus, the New Zealand Commission of Inquiry into alleged Nuisance at Mangere (not to be confused with the 1964 Commission of Inquiry) said in its report (Aug. 1959 p9):

"Many of the residents seem to have been uncertain of the nature of the offending gases and to have confused ideas as to the origins of their troubles. It is, we think, clear that as the emission of yellowish, acrid gases from the fertilizer chimney stacks is obtrusively evident, there has been an inclination with some people to blame the effluents when emissions from the mudflats were the real causes of the trouble. The term 'the yellow flag' is current in the district and refers to these emissions of acrid gas....."

People may, also, tend to ascribe odour to things that they think are likely to emit odours. For example, Mr. Lambden and the author investigated a complaint of smell in the McBratney Road area (Nov. 1966). The trouble was found to be caused by two market gardens which had been covered in chicken manure. The resulting smell was local in extent. But the interesting thing about this case was that a resident, though she had seen the manure being forked off a truck, thought the smell came from the Works two miles away.

In the absence of concrete facts, interested parties in the Aranui dispute characteristically engaged in free speculation - a fact which might have intensified, rather than assuaged, conflict. Besides the claim that smells were emitted from the trickling filters there were claims that smells were emitted from: the Council's rubbish dump; varying sources; several sources; farms and factories; pollutants in the rivers and Estuary; the reticulation system; the vented manholes when the mains became gorged; the gas holding tanks at the Works; and the old septic tank sites. Various political interests might sometimes have pressed individuals into advancing one or other of the different explanations. Mr. Mathison, for example, when requested to address the protest meeting, was aware that his political interests were at stake and stipulated that he should speak before his political rivals did. Again, Mr. Lambden probably felt that it was his duty to point out the proximity of the dump and Estuary to the Works.

The advancing of so many theories to account for the alleged smells was only possible because the situation was so complex. There might well have been several sources of smell. * Deciding evidence would be difficult, if not impossible, to obtain. Confusion, created by argument over each theory, made the situation even more muddled and progress toward a resolution of the conflicting pressures was retarded.

Conclusions

We have considered the evidence relevant to the question: Were there smells? How should we now answer this question?

* See Street Map, Vol. 10

Unfortunately, it has not been possible to reach a simple, categorical reply. It can be said that more residents than Mr. Lambden knew about were prepared to say that there had been smells. It can be said that Mr. Lambden's investigations may not have been theoretically well based. The fact that residential discontent continued for so long - years, rather than weeks - would seem important. It seems unlikely that protest would have continued for so long without some sort of objective provocation. The evidence, then, which Dr. Gregson and the author considered has been set out. The conclusions which they thought most reasonable were stated in their final report to the A.A.P.R.C. These conclusions were listed at the end of the preceding chapter.

CHAPTER V.

ANALYSIS OF THE HUMAN BEHAVIOR INVOLVED IN THE ARANUI DISPUTE

Residents' reactions to neighbourhood problems can have costly consequences. Industry in Los Angeles (U.S.A.) was forced to spend millions of dollars on anti-air pollution devices before it was proved that the city's air pollution problems were caused more by the exhaust gases from automobiles, than the fumes from factories(Hodges 1958 p171). In Newark and Elizabeth N.J. (U.S.A.) violent community protest forced the temporary closing of one of the United States' busiest airports after a series of tragic accidents had aroused widespread fears and anxieties (Borsky 1954).

Why do some communities react to troubles while others do not? Why do some reactions die out? At Mangere (N.Z.), for example, residential protest over midges and smells alleged to come from the Purification Plant in the area led to a commission of inquiry. The Commission of Inquiry made recommendations, the midge problem was solved but the smells are, presumably, as bad as ever. The residents have learned to live with them (remark made in a letter to Mr. Seymour written by the president of the Mangere Resident Association).

Cases such as these, and the questions they give rise to, highlight the importance of sociological research into social phenomena like the Aranui dispute.

It is convenient to begin this analysis with the statement that: whether or not smell of a given intensity will be evaluated as being intolerable will in part depend upon the prevailing norms; if the norms become more limiting then a community trouble will become more salient in the minds of the members of the community. In one value climate a smell of intensity level X may go unnoticed while in another a smell of identical intensity level may excite protest. Hence if the values prevalent in a community change, a smell of intensity X can come to be defined as a problem though it was not initially so defined (Medalia & Finkner 1965 p54). In the Aranui case there was evidence which suggests that the residents of Aranui have always been aware of unpleasant smells (see chapter IV). Perhaps the type of person who has taken up residence in the district in more recent years has changed or perhaps national values related to air pollution or health hazards have changed.

Community values may be relevant to disputes in other ways than that just discussed. Should residents feel that their rights are being violated by public officials then opposition to these officials may constitute moral resistance (Green 1961). The Aranui residents might have seen the Board as acting without due regard for them as citizens. In fact, the Aranui residents did tend to exhibit a distrust of public officials (see appendix IV).

If an event threatens an important aspect of the residents' lives (e.g. health, property, religion, employment etc.), Coleman (1957) argues, it may spark off a controversy. In the Aranui dispute, complainants did tend to be the residents who were worried about the effects of the smells on their health and property (see appendix IV).

So much for the social values relevant to the Aranui dispute.

In the last chapter, the conclusion was reached that the Aranui residents were afflicted by smells in their district. The evidence would suggest that these smells were emitted either from the trickling filters or vented manholes. Hence, much of the complaint behavior can be viewed as similar reactions to the same environmental stress, rather than some kind of 'social' or 'imitative' action. Thus, the question: why do different people act together to meet a community issue? needs to be considered here.

People may be motivated for a variety of reasons to exhibit similar community behavior simply because the situation provides roles into which the variously motivated behavior can be channelled. An act of complaint, such as writing letters to the newspapers, could be motivated by the desire to protect dependents and property, by the desire to strengthen the case for anti-air pollution measures, by the desire to create political capital to further political career hopes etc.

Mr. Lambden thought that the complaints were stimulated by a few activists and that most of the residents were not bothered by smells. As was indicated in the last chapter, though, the situation was not as simple as he claimed it was. Yet there were a few activists.

The housewives who initiated the 1963 petition, the League presidents and Mr. Davidson, all played central parts in the dispute. Further, Mr. Lambden himself was a central figure. It would seem that Board decisions and policies relevant to the residents' allegations were, probably, predominantly based on data and recommendations it received from Mr. Lambden (this has been stated to the A.A.P.R.C. by Price and Russell). But, material, which Mr. Lambden collected, would have been related to his understanding of the situation. Observations made would have been those which, he felt, were pertinent to the residents' allegations and these observations would have influenced his opinions governing further observations.

Finding himself in the position of having to investigate, and evaluate, complaints received from the residents, Mr. Lambden amassed several folders full of information which he used in reports both to the Board and to the A.A.P.R.C.

Mr. Lambden thought that if the League became knowledgeable about the results of the different investigations that he carried out, the members would change their allegations to be in accordance with his findings. This disposition to suspect the validity of the residents' allegations prevented him from freely communicating with the residents. His behavior at the A.A.P.R.C. meetings, too, tended to be cautious if not defensive.

Though Mr. Lambden felt that roofs and air filters would be fun to design he did not feel that he would be justified in recommending such on the strength of the data he had collected. Even if odour was

emitted from the Works it would have had to be fairly intense and have bothered a reasonably large number of residents before the Board, in Mr. Lambden's view, would have been justified in spending large sums of public money on control measures.

In the role of chemist, and as one of the Board's employees, Mr. Lambden considered that his job was the running of the Works as efficiently as possible, which did not mean involving himself in political debate with the residents living about the Works. He was concerned with the objective, physical facts of the situation and he felt that the data he had collected did not evidence a problem. An argument advanced by Raulet (1961) is relevant here. Raulet says that in the fluoridation disputes, health professionals (doctors, chemists etc.) defeat their own interests by spurning political involvement. Assuming their professional, authoritarian roles, they seemingly confirm their opponents' charges that they are undemocratic. By avoiding partisanship they appear to be keeping information back and are exposed to charges of unfair play and suspicion. Finding that their intentions are impugned and that their claims to authoritativeness are often unacknowledged they react by retreating further into their professional roles which leads to further charges of undemocratic behavior. To some extent a similar line of reasoning might explain Mr. Lambden's part in the Aranui dispute.

The press clippings looked at in chapter III suggest that Mr. Lambden was viewed by the residents as a key figure. Remarks made by Mr. Milthorpe and by respondents suggest that he antagonized the residents

by denying that smells from the Works could bother them. Of the 52 complainants interviewed, 18 spontaneously commented that Mr. Lambden had been an obstacle preventing them from achieving anything. Probably, Mr. Lambden was bound to have been seen as biased, by the residents, simply because he was an employee of the Board and responsible for the Works.

The fact that Mr. Lambden was essentially in a position of role conflict seems to have been reinforced by the fact that he was not in a position to make policy decisions. The Board, having not communicated its intentions to the residents, was content to use Mr. Lambden as a barrier between it and the residents. It is neither clear why the responsibility of investigating and evaluating complaints was, even after protracted protest, left to Mr. Lambden, nor why the Board never arranged to discuss the matter publicly. The following instances illustrate the lack of public discussion: (1) The Board neither discussed the purchase of the gas chromatograph with the residents nor admitted, publicly, the limitations of the instrument, (2) One of the A.A.P.R.C.'s wardens telephoned Dr. Gregson (June 1967) to say that she, and the other wardens, were worried that they had been employed when there was no smell about - actually Mr. Tucker had realized this and asked the author about the possibility of the A.A.P.R.C. having more volunteers trained so that a more ambitious investigation could be conducted during the warmer months, but he had not said anything to the wardens. (3) Mr. Alcorn felt that he had been 'bulldozed' into the position of chairman of the A.A.P.R.C. Such cases indicate that the Board - other parties

communications were inadequate and that the Board did not enjoy the trust of the different parties involved in the dispute.

The residents thought that the Board had not discussed the problem of the alleged smells publicly (see appendix IV). It would seem that the Board, as a public body, did not know how to discuss the problem diplomatically for fear of committing itself to unnecessary, or useless, courses of action. Part of the Board's inability to discuss the matter publicly might have arisen from the fact that the Board was composed of laymen, rather than experts, in community administration. A good deal of the Board's difficulty, however, arose from the fact that its meetings, as those of a public body, are subject to Press scrutiny. The Press could, and did, attend the Board's meeting to report any business that came before the Board. Any data which was tabled at a Board meeting became public knowledge and could be used by interested parties. Thus, Board members perceived that even tentative discussion about the alleged smells would be construed as evidence that the Works was to blame and responded by discussing the matter in sub-committee.

Another factor that should be mentioned is that the exact relationship between the Board and residents was never very clear. Typical of local bodies, the Board's responsibilities and powers are not well known or formally set out anywhere. The Board seemed to act more like a self-interested body than a service committee. Just why it should have behaved in this way, and whether such behavior is characteristic of public bodies generally, are sociological problems

in themselves. A possible reason for such a development was that the Board was associated with a utility which had few positive associations. The dearth of public interest in Board elections would have meant that Board members would not have had the opportunity to sense the mood and opinions of the different segments of the public.

The relationship which developed between the Board and the League hints at what may very well be a fairly common phenomenon. In essence the Aranui study deals with non-democratic aspects of a society that is generally held to be governed democratically. The Drainage Board members were elected according to legally prescribed procedures by the people of Christchurch at large. A small proportion of the electors, dissatisfied with the Board's performance on a particular issue which was of close concern to them but not to the larger proportion of electors, consciously or unconsciously, made the League an 'anti' Board body. That this should have happened in a society like that of New Zealand could be argued to have been inevitable for at least three reasons. Firstly, when people come together, be it on public boards or in resident associations, norms and role expectations develop which define the groups for the members (see Madge 1962 pp458-9). These norms and role expectations act back on the members' original motives for associating together and change them (see Homans 1951 p108). Secondly, because the Board members represent a larger population than that from which the complaints came they will tend to be more concerned with diffuse issues than with specific problems. Thus the Board would have been seen, by the complainants, as unsympathetic while the League

would have been seen, by the Board, as an isolated, minority group. A third reason, perhaps complementary to the last, is that a concern with technical problems might cause groups to lose sight of, or become more distant from, the people they serve. The fact that the Board was largely composed of laymen meant that it tended to look to expert, rather than public, opinion.

Anti-Board reactions to the consequences of committee dynamics were probably complemented and reinforced by another factor. Paradoxically, this factor concerns the Board's practice of consulting groups which may be affected by its plans (e.g. regarding the Estuary). Information which the Board has supplied to different groups, has typically been reported from the viewpoint of possible disadvantages to the different groups. The Board might have tried to communicate with interested parties on most issues before it but it has not appeared to in the relevant Press reports. Instead, the image of the Board manifested through the newspapers has been one of a local body that is habitually involved in controversy, rather than discussion. This general image may well have had a halo effect on the Board's relations with the Aranui residents.

Lack of public discussion between the Board and the residents could reflect a state of discordance (see Olsen 1965). The residents' opinion that the Board should have discussed the matter of the alleged smell publicly was apparently not shared by the Board members. Further, it could be argued that there was a need for a central agency which could have adjudicated between the Board and residents.

In spite of the fact that New Zealanders are most pervasively dominated by the New Zealand Parliament (see Local Government in New Zealand 1949) they are more directly governed through local bodies. The setting up of local bodies and ad hoc authorities is a colonial tradition so that contemporary New Zealand can be compared with nineteenth century Britain where a proliferation of separate forms of social organization, only partially connected and sometimes super-imposed upon one another excludes anything which could be called a system (see Webb & Webb 1922 p478). The need for a central agency was suggested, again, by the fact that the Mangere Commission of Inquiry's recommendation - that, local authorities be empowered to buy land about sewage treatment works - went unattended. Between 1962 and October 1966 over 120 residential properties were sold East of Pages Road. Even in 1966 homes were being built within sight of the trickling filters.

The residents and Board members beheld the Aranui problem in different perspectives. One party complained about the lack of action on the other party's part. Complaints which were ostensibly about environmental conditions, however, could be reinterpreted as reflecting the residents' fear that some of their interests were being threatened. If the complaints, moreover, are related to the interrelationships and expectations implicated in the network of social roles, a tentative explanation of the tensions which prevailed between the League and the Board can be formulated within Gouldner's theory of group tensions (Gouldner 1954).

To the degree that the League's demands and expectations were specific and the Board's concerns diffuse the two perspectives would have been incongruent. Tensions between the groups would have been related to the time the Board took to act; ignorance of each other's point of view; expectations being seen as illegitimate (e.g. that the residents live with the smell or that the Board spend thousands of pounds on covers for the trickling filters); distrust between the parties; and the failure of each party to positively sanction each other (e.g. the Board never gave recognition of any help which the residents proffered and the residents never acknowledged steps which the Board and Works staff took to eliminate the smells). These hypotheses were not specifically tested in this study which, for this reason, illustrates, rather than proves, some of Gouldner's ideas.

SUMMARY

In this chapter and the last, the Aranui dispute has been discussed on the levels of the physical and the social.

It has been concluded that the physical environment included intermittent smells of variable intensity emitted from the Works and other sources in the district. The important thing to note is that no party was able to prove that the smells either did or did not come from any particular source. This indeterminate state of affairs gave rise to various theories, and argument which resulted over each theory only served to make the situation even more obscure. Though maintenance operations and breakdowns might have initially created a reputation for

the Works, the regular occurrence of smells, and the almost equally regular newspaper reports of protest, made the residents susceptible to demands from a few individuals for concerted action. People like Mrs. Lucas and Mrs. McIntosh (the housewives who initiated the 1963 petition), Mr. Dick (the 'Star' reporter who lived in Bickerton Street), Messrs. Seymour and Holmes (presidents of the League), stimulated and spearheaded protest from the residents. Board members, like Mr. Davidson and Mr. Stubberfield, interested themselves in the problem, perhaps because they were trying to build up political capital for more ambitious political moves, or, perhaps because they had been troubled by the smells themselves - Mr. Davidson, for example, works across the road from the Works at Millers Ltd.*

Because the Board became divided over the issue, a deadlock resulted at Board level. Mr. Price (a retired school teacher) and Mr. McClelland (a civil engineer) resisted Mr. Davidson (a plant mechanic) and Mr. Leach (a bus driver). Disparity of the Board members' educational attainments and the resulting poor communications between the members of the Board might have been a factor making for Board difficulties.

At a more general level, it was argued that because Board members were laymen, Board opinion was shaped by Mr. Lambden's understanding of the situation. Mr. Lambden was by training a chemist and not a public relations man. His tendency to doubt the sincerity of complainants and his unwillingness to discuss the matter with the residents did more

* See Street Map E5.

to annoy them than anything else.

Lacking precedents, the Board had no established methods for handling the problem. The fact that it was unsure, firstly, if the Works was, in fact, to blame and, secondly, what should be done if it was, coupled with its exposure to the Press, meant two things. The matter was drawn back behind the scenes into sub-committee and the residents, having no idea what was being done, concluded that nothing was being done.

The situation was characterized, generally, by inadequate communications between the participating parties. This state of affairs arose because of a number of factors: Mr. Lambden's personality, the Board's acting as a self-interested body, the Board's public image and a typical lack of cooperation between local authorities.

Whether or not the smells were intense enough to justify the Board's spending thousands of pounds was a question which would depend upon the crystallization of norms governing how intense smell from the Works could be before it should be deemed intolerable. Such norms are, probably, eventually achieved by public debate.

CHAPTER VI

THE ARANUI STUDY IN SOCIOLOGICAL CONTEXT

We have come to the point where it is necessary to place the Aranui study into its sociological context. Yet, for a number of reasons this need is easier to admit than satisfy. There is, in fact, little literature immediately relevant to the Aranui study. Most investigations of community organization have looked at complete communities - villages and small towns - and have focussed upon relatively permanent features of the social structure(e.g. see Lynd & Lynd 1929, Willson 1961, Lowry 1962). The Aranui study concerns a dormitory suburb and a transient, contingent power structure. Relations between the Aranui residents and the Drainage Board have never been very formal. The leaders of the League raised 'anti' Board feeling not because other groups wanted them to do so but because they themselves were troubled by the smells. The Board, having to attend to the needs of a more inclusive area than the environs of Aranui, was only partly concerned with the needs of the Aranui residents. This study focuses on the behavior of a fraction of a total community which concerned itself with one item of a local authority's business. But it should be stated clearly, the author does not want to suggest that the Aranui

neighbourhood is characterised by anomie or that there is no orderly social activity (sports clubs, plunket society etc.). He does want to suggest, however, that, relative to the cases described in the literature, the Aranui study does not deal with a well-developed, unified power structure.

Several studies of local body behavior focus on resident resistance to formally proposed community change (e.g. the fluoridation dispute studies); the reverse is true for this study which focusses on the resistance of a local body to the demands of a sector of its electors. Labour management studies have had an economic bargaining factor as a central variable - the participant parties in the Aranui affair lacked economic or physical sanctions which they could apply to one another.

The League was looked at from the point of view of its performance on one issue - no attempt was made to discover whether or not Aranui activists exerted an influence on other issues, or in other community or metropolitan associations, as well and in this way defined a stable power structure (see Scoble 1961 for an example of a multi-issue stable structure study). They might have. Yet, the author has no reason to state that the Aranui residents, who have opposed the Drainage Board over the smell problem, would necessarily be generally socially influential in their neighbourhood. Instead, he sees these people as residents who, because they were afflicted by the same environmental stresses, cooperated.

If there have been attempts to conduct the type of investigation

reported here they have been few in number. It is true that the author, as an advisor to the A.A.P.R.C., acted in a role of participant observer. Perhaps, few researchers have had the opportunity to study similar conflicts, at least, from the inside.

Studies of community leadership have tended to be comparative, rather than descriptive. There has been an increase in interest in dimensions along which leadership varies (e.g. 'scope', 'legitimacy' etc. see Bonjean & Olson 1964-5). Thus, Rossi (1956-7) advances a general theory of community decision-making while noting that few studies have attempted to follow particular issues from start to settlement and that the large number of Inter-University Case Programme studies are primarily concerned with non-local issues. Unlike Rossi's article, this study focusses on actual interactions and personalities rather than the variables of formal, or institutionalized, authority.

The closest study to the Aranui study found by the author is the study, 'Coventry Moves a Market' reported by Willson 1961. Yet, even this study, in Willson's words, "...lacks sadly the details of councillor participation, in the internal political manoeuvrings within, and between, committees and the influence of particular individuals or groups". Many of the details that Willson did not have access to are the very type of details which were available to the author. It should be remembered, too, that the original motive behind the Aranui study was a practical one in that data was sought to help the Drainage Board solve the Aranui dispute. This fact had two implications;

firstly, the author was himself a factor that influenced the outcome of the dispute and, secondly, interest was directed toward some variables and not others in accordance with the practical aims of the study. The goal was to identify factors which initiated, fostered and perpetuated conflict between the residents and the Board. The task was to discover causal relationships, rather than sequential patterns through which the dispute moved. A number of applicable schemata are to be found in the literature (see Coleman 1957 p12, Sanders 1961, Pendray cited in Hodges 1958, Klapp & Pagett 1959). Such schemata, however, do not facilitate control. Again, attention was paid to social processes, rather than static status variables. Three studies which have tried to identify variables which differentiate complainants from non-complainants are the Borsky (1954), Jonsson (1964a) and Medalia & Finkner (1965) studies. Unfortunately such studies have tended to reach different conclusions regarding the differential power of the various status attributes (sex, age, occupation etc.). This disagreement, the author feels, results because the different types of community troubles have different operating characteristics. The Aranui dispute, for instance, centred on the discontent in a suburban locality caused by unpleasant, intermittent smells from unproven source(s) and of unagreed intensity; while: the Borsky study centers on the reaction of residents, living about airports, to the fear of plane crashes; the Jonsson study looks at reactions to stress caused by traffic, neighbour behavior and factory fumes; and: the Medalia-Finkner study looks at reaction to air pollution caused by a kraft mill.

The objective definition of community troubles would appear to be necessary before comparative generalizations can be made. It should be noted, though, that this is not a simple matter (see appendix V). The difficulty is that definitions would seem to inevitably include terms relating to threshold levels and values and both these factors vary between people, and within individuals, over time.

The Aranui study was not specifically concerned with aspects of a formal power structure. Though some sort of community decision-making process was involved, is it appropriate to speak of 'community power', in any classic sense, in a case like this? From one point of view, the situation could be described as one containing two main parties, both of which were socialized in the same general culture and interacted until agreement was precipitated by a third, uncommitted, expert group. From another point of view, it can be observed, "...that the ability to raise issues into controversies is an important source of power"(Rossi 1956-7 p441). The League through persistence and the fortunate supporting influence of experts was able to motivate the Board to act. If the Aranui study deals with a form of social power this power was more the ability to get the Board to agree to help than the ability to control the Board by force.

It is the author's contention that none of the published studies on community power has managed to reflect the essence of civic behavior. Of all the recent studies, Polsby's (1959) approach would seem to be the most applicable to the New Zealand scene. Polsby investigated the business, social and political elites of New Haven, and

found remarkably little overlap between these spheres of power.

Much confusion has resulted from the desire to develop reliable methods to identify community leaders. To the extent that community members are oriented to broader social realities than the local situation, however, there is no reason why leadership structures should develop at the community level. This comment is particularly pertinent to an urban neighbourhood.

If the interaction between the Aranui residents and the Drainage Board was at all typical of local body affairs in New Zealand, then power processes which occur in the New Zealand political machine are diffuse, 'polyolithic' and complex. These processes could be superimposed, adjacent, integrated or separated in countless fashions and the notion of the existence of leaders as, 'men who get things done around here' would be too naive to explain activities outside the domestic back-yard. Moreover, this conclusion would be reinforced if it was found that the pluralist's contention that there is little overlap between spheres of power (see for example Polsby 1959) applies to suburbs such as Aranui.

Theories of political life which seek to explain political reality by reference to the emergence of a national personality type that is disposed to invest political interests in the hands of the professional politicians and accept inevitable trends (see Riesman 1950); by reference to myriad pressure groups acting as checks upon one another (see Truman 1951); by reference to the bargaining processes within a political party (see Eldersveld 1964) or by reference to the

autonomy of top bureaucrats (see Mills 1956) miss the sort of sub-, or non-, political party politics described in this study.

Finally, we have to look at a problem which, but for the practical aspects of this study, we would have looked at first: what should the theoretical aim behind community studies be? Rossi (1956-7) says:

"It is only when we examine and compare a number of decisions that the tendencies characterising different issues and decision-makers can be discerned. In other words, research on decision making should be intensive and comparative rather than the case study technique"

In another plea for comparative studies, Rossi (1960) complains of the non-cummulative nature of community studies. He says that each investigator has claimed that his community must be recognised as being different from the communities that others have looked at; that the only firm generalization that one can make is, '... the power structure of local communities and decision making processes to be found therein show a significant range of variation'. The failure of generalizations concerning the sources of variation to emerge, he argues, is explained by the lack of comparative studies and the lack of a conceptual scheme specifying the important elements of community structure. Rejecting the goal of developing a grand scheme, Rossi advances the notion that schemes should be worked up to be pertinent to the problem at hand. Even if we agree with Rossi, we are not forbidden to ask: where do we get the material to make the comparative studies Rossi calls for? Is the collecting of case studies the first step? Is Rossi calling for too much too soon? Rossi himself looks at case studies to find support for his thesis that differences in community power structures

reflect differences in the political lives of the different communities. He describes four types of power structures: pyramidal (boss rule - typical of unified, established communities), caucus rule (committees of equals - typical of dormitory suburbs), 'polyolithic' rule (separate leaders for different spheres of activities) and amorphous structures (no power behavior apparent at all). The case study, it seems, is still necessary.

It may be felt that the author has done exactly what Rossi complains about and has, in effect, said: Aranui is different from all other community situations studied. Yet, the author has tried to define the nature of the phenomenon studied because he recognises the strength of Rossi's criticism of community studies that one of the reasons for the failure of researchers to formulate generalizations has been their lack of a conceptual scheme. The attempt has been made, not to isolate Aranui from, but to relate Aranui to, the wider New Zealand society.

It is customary to conclude scientific reports by indicating the direction that future work could profitably take. This is not difficult in the present case, because two interesting findings, at least, have emerged.

The first, the argument that the Christchurch Drainage Board behaved like a closed, self-interested group, is worth pursuing. Do all public committees tend to behave in this fashion? If they do - what are the broader implications for political life in general? Do local bodies always have difficulty cooperating with one another?

The second subject that would repay further investigation is the non-democratic element in resident associations' opposing elected representatives. Will disputes, such as the one studied here, lend support for Sir Mathew Oram's call, as president of the New Zealand Constitutional Society, for the New Zealand Ombudsman to be given the power to investigate grievances that private citizens have against local bodies? Are such developments inevitable in any contemporary, western polity?

¹ Press 23/10/67.

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APPENDIX I

PRIMARY SOURCES OF INFORMATION.

1. 1/11/66 Aranui Progress League's public protest meeting. Notes on what president of the League and M.P. for Avon said to 150 residents.
2. Nov. 1966 Content analysis of press clippings from 1960-66 to delineate the situation as it had been recorded in the newspaper archives and to gauge to what extent the newspapers could have been a causal factor in the dispute.
3. 21/11/66 Introduced to Chief Chemist of Christchurch Drainage Board, Mr. Lambden, general discussion of problem and tour of Works.
4. 21/11/66 League meeting. Notes on business, 35 attended, spoke to executives after meeting.
5. 23/11/66 - 2/12/66 Visits to Works to peruse the Chemist's files. Also many discussions with Chemist and Works staff.
6. 5/12/66 Interviewed local Doctor's wife. Notes on her perception of situation, League and Works staff.
7. 6/12/66 Interviewed personnel of City Council Health Department.
8. 24/1/67 - 1/2/67 Questionnaire administered to sample of residents.
9. 27/2/67 Report to A.A.P.R.C. on results of survey.
10. 14/3/67 Interviewed M.P. for Avon.
11. March 1967 Communicated with Mental Health Units.
12. 11/12/67 Telephone conversation with local Doctor.
13. 26/6/67 Telephone conversation with the Secretary of the Christchurch Drainage Board, Mr. Tucker, about constitution of the Board.
14. 26/6/67 Telephone conversation with the President of the League about constitution of the League.
15. 13/7/67 Discussion with Chairman of Construction & Treatment sub-committee, Mr. Russell.
16. 13/7/67 Meeting of A.A.P.R.C. - discussion of University report prepared by Dr. Gregson and the author.

APPENDIX II

SAMPLE USED FOR RESIDENTIAL OPINION SURVEY.

Using the names from the Chemist's files (complainants) the author scored individuals for the number of times they had communicated with the Works staff. Arbitrary cut-off points were set from the resulting distribution pattern so that three complainant groups were identified: those who had complained 1-2 times (113), those who had complained 3-12 times (37) and those who had complained more than 13 times (6). Using a random selection procedure (scattering cards with names written on them over the floor before sweeping them up and shuffling them) 29 of the first group and 18 of the second group were selected, while all of the last group (5 as 1 was abroad) were taken, to complete the sample. The sample was composed in this fashion so that complaint behavior could be used as a variable. The sizes of the sub-samples were set with the thought in mind that the author had to do all the interviewing himself and yet with the hope that the numbers would be great enough to allow the results to be generalized.

Because the situation allowed it - few investigators have complete lists of names - the members of the complainant sample were matched with people who had not complained to the Works staff (non-complainants). To do this, the author stood at the gate of each complainant, threw a dice and alternatively counting clockwise and anti-clockwise, taking care to avoid other complainants, selected one of the complainant's non-complaining neighbours for interviewing (neighbours considered were those immediately adjacent and the three opposite these two and the complainant). Non-complainants were selected in this way so that the author could see if there were any differences between residents who had complained to the Works staff and residents who had not complained to the Works staff but who had been living in the same atmosphere as those who had complained since they had been living in the same geographical locality. The following weaknesses of the matching procedure are recognised. On the one hand, people who did not complain even when those about them were complaining may have been physiologically insensitive or not well integrated into their community, or, on the other hand, people who did not complain even when those about them were complaining may yet have been semi-converted to the view that smells were emitted by the Works by the complainants living about them - in either case the resulting sample of non-complainants would have been biased. It was hoped that neither weakness actually obtained and the assumption was made that those who had not complained, even though they lived near people who had, did not complain because they were not, in fact, bothered by the alleged smells.

The sample members were interviewed 21/1/67 - 1/2/67 (104 respondents). Three names in the initial sample of complainants had to be replaced since these people had shifted from the district; they were replaced from their respective complainant categories. There were

no refusals excepting one non-complainant who said that he would rather not answer the questions as he was employed at the Works; he was not pressed.

Using the sampling procedure outlined, the probability of a resident being interviewed, as a complainant, was greatly less the further the resident lived from the Works.

	$-\frac{1}{4}$ mile	$\frac{1}{4}-\frac{1}{2}$ mile	$\frac{1}{2}-\frac{3}{4}$ mile	$\frac{3}{4}-1$ mile	$1-1\frac{3}{4}$ miles
each P.S.	.116	.043	.0014	.0014	.00052
Number S.s interviewed	(10)	(13)	(9)	(13)	(7)

(S = 1 complainant.)

Total number of dwellings in 5 zones = 3272 (Town Planning Authority Map August 1966).

Respondents generally seemed pleased that something was being done at last and thanked the author for calling.

APPENDIX III

QUESTIONNAIRE USED.

UNIVERSITY OF CANTERBURY.

DEPT. PSYCHOLOGY & SOCIOLOGY.

A CONFIDENTIAL OPINION SURVEY

We are carrying out this survey to find out what the folk like yourself think about the area you live in. Any information you give us will be anonymous. Because different things are important to different people, we do not expect you to have an opinion on everything. If you do not have an opinion for some of the questions just tell us that.

I wonder if we could begin with this question:

1. How many years, would you say, you have lived in this area?
.....years
2. Have you ever thought of moving from the area?
.....yes no
3. In general, how would you rate this area as a place to live?
 excellent
 good
 fair
 poor
 very poor
 d.k./n.a.

(If excellent - fair ask Qs 4 & 5 in order, otherwise, ask 5 first. Begin first Q asked with, 'What are some of the things', and the second Q with, 'Are there some things')

4.you like about the area, things that make it a good place to live?
 anything else?
5.you do not like about the area, things you think are disadvantages?
 anything else?

(If S has not mentioned air pollution/odours as a disadvantage)

- 5b. Have you ever been troubled by air pollution in this area in the past? yes..... no

(If 'no' skip on to Q 15)

If yes : Which of these statements do you think describes the

situation in recent years? (Present card A)

- a. air pollution has become more of a problem each year
- b. air pollution has become less of a problem each year
- c. air pollution has continuously been a problem

5c. When did you first notice air pollution in your area?
.....

6. Do you think that any air pollution that might occur in this area should be just accepted as part of the district yes... no ...

7. Which of the following do you think the term air pollution means?
- a. dirt and dust in the air
 - b. bad smells in the air
 - c. haze or fog in the air
 - d. - something else

8. Have you ever been troubled by bad smells in the air in this area yes no

If yes: would you say they have been:

- a. very unpleasant
- b. quite unpleasant
- c. not noticeably unpleasant

Do you ever worry about the effects of these bad smells on your health? yes no

If yes: often sometimes very rarely

Do you ever worry about the effects of these bad smells on your property? yes no

If yes: often sometimes very rarely

Have you ever thought that weather conditions have had anything to do with the bad smells you have experienced? yes ...no.....

If yes: under what weather conditions would you say they have been worst?

- 9a. Do you think that air pollution in this area:
- a. can be reduced
 - b. can not be reduced
- b. If can be reduced:
- a. can be eliminated
 - b. can not be eliminated ...

10 What do you think are the major sources of air pollution in your area? It would help us if you could give us them in order of the most important to the least important.....
.....

any others

11. (For sources related to companies, public bodies or private citizens).
Which one of these statements do you think best describes the effort the source(s) you have mentioned, are making to control air pollution in this area? (Present card B).

	S1	S2	S4	S5
a. no effort
b. little effort
c. some effort
d. a great deal of effort
e. d.k.

(If the Works has not been mentioned skip on to Q 14)

12. Do you think the Drainage Board or Sewage Treatment Works staff have freely discussed the Sewage Treatment Works with the residents in this area? yes.....no
d.k.....

If no: Do you think this is because the Drainage Board members or Sewage Treatment Works staff feel that they do not have to discuss the Works with the residents or because they think the residents are not interested:

feel they do not have to
think the residents not interested
d.k./n.a.

Do you think the Drainage Board and Sewage Treatment Works staff do not need to discuss such matters publicly or do you think they should?

do not need to
they should
d.k./n.a.

- 13a. What has the Drainage Board or Sewage Treatment Works staff done to lessen any nuisance the Treatment Works may have caused?
- b. Is there anything which you think the Drainage Board or Sewage Treatment Works staff should do that they have not as yet done?
14. How would you say that you get most of your information about what is being done about air pollution, would you say: the newspapers, T.V., a public body, the Aranui Progress League or friends have done most to inform you about what is being done about the air pollution in your area?

Do you get as much information as you want from these differnt sources?

15. In general, would you say that you are:

	very dissatisfied	dissatisfied	neutral	satisfied	very satisfied
with the quality of the streets in your area (i.e. road surfaces)					
with the standard of local shopping facilities.					

16. Have you ever complained about some aspect of your area to one of the following?

	one of the newspapers	your local M.P.	some other person or organization
yes			

17. People have different ideas of how they fit into community affairs - would you say you are: (Present card C).

- a. a person who contributes to community decisions
- b. an ordinary person in the community
- c. not part of the community at all

18. Generally speaking, do you think there are any men in this district who are able to say what should be done? If you do, who do you think they are?

name	occupation
.....
.....
.....

19. Would you say that you are unfamiliar, familiar or very familiar with the activities of the Aranui Progress League.

- unfamiliar
- familiar
- very familiar

20. Do you think the Aranui Progress League has achieved anything that will help you?yes no d.k.....

Comments Qs 20 and 21:

22. Would you say whether you agree very strongly, agree strongly, agree, neither agree nor disagree, disagree, disagree strongly, or disagree very strongly with the following statements please: (Present card D)

	AVS	AS	A	=	D	DS	DVS
a. Public bodies should be very careful how they spend the public's money							
b. Members of the public have a right to tell public bodies what to do since the money comes from them anyway							
c. It is alright for residents to demand that public bodies fix any trouble in their area because the public bodies have more money than they have							
d. Members of the public should not try to tell Public Bodies how to spend rate money since they do not have the necessary knowledge							
e. It is silly for private citizens to demand that public bodies spend a lot of money to fix some trouble or other because such demands always come back to their own pockets anyway							
f. Public bodies should only fix troubles caused by their own organization							
g. It is the job of public bodies to fix anything that troubles private citizens							
h. If private citizens move to areas where there has always been some problem or other they have no kick coming							

- i. People who stand for public office have a sense of civic duty
- j. People who go into public office are usually out for all they can get
- k. Elected officials become tools of special interests no matter what (i.e. get under the thumbs of men behind the scenes)
- l. Local officials soon lose touch with the people who elected them no matter what
- m. If people knew what was really going on in high places it would really blow the top off things

.....
.....
.....
.....
.....

Now we would like a few facts about yourself - of course any information you give us will be anonymous.

- 23. Would you say you know the names of:
most several or few of your neighbours?
- 24. Have you any hobbies? yes no
If yes: what are they?
cooking, gardening, wood/metal work, art etc.
- 25. Do you belong to any of the following kinds of local organizations:
Name
Sports club
women's guild
men's working club
business Ass.
service organization.....
P.T.A.
cultural club/Soc.
church
other
- 26. Are you single, married, widowed/divorced?
- 27. How many children have you living with/ near you?

28. How many relatives do you have who live in your district?
 parents
 brothers & sisters
 cousins
 inlaws
29. What age were you when you left school?
30. Did you have any training of some sort after you left school?
 yes no
 If yes: details
31. What is your occupation? (Husband's if S is a housewife)

 details and address of employment

32. Have you got a telephone? yes no

Well, that's the lot - thank you very much for your cooperation.

INTERVIEWER RATINGS

S's age 20-35 36-55 56+

S's ethnicity

S's interest in the subject of air pollution:

High: S made spontaneous comments about air pollution - wanted
 to talk about it

Ave.: S answered Qs without being pushed but did not volunteer
 information

Low : Had to drag answers from S

Rapport: friendly Antagonistic
 1 2 3 4 5 6 7

Sex: M F

Complaint rating (from Chemist's files) 0...1...2...3...

S's state of health: good poor

Distance of S's home from the Works:

$-\frac{1}{4}m$... $\frac{1}{4}-\frac{1}{2}m$... $\frac{1}{2}-\frac{3}{4}m$... $\frac{3}{4}-1m$... $1-1\frac{1}{4}m$...

APPENDIX IV

FULL ANALYSIS OF RESIDENTIAL OPINION SURVEY DATA.

Data to help answer certain questions were collected by administering a questionnaire to 52 of the 159 people whose names had been recorded at the Works and 52 matched pair residents - chosen from the same locality and of the same sex as pair complainants.

Complainants are graded 1, 2 or 3 depending on whether they had complained 1-2, 3-12 or 13+ times, to the Works staff, respectively

Since responses to the different questionnaire items do not correlate highly with one another these items are for analytical purposes considered to be independent. Thus χ^2 values are reported as measures of association. Chi square values are given alone only when the table to which they pertain exhibits a clear and meaningful trend.

Confidence limits - for generalizing to the total population involved (complainants and non-complainants) have been calculated and are given at the end of the analysis but for the sake of clarity have not been included in the text of the analysis.

Of the 104 respondents, 50 complainants and 41 non-complainants said they had been troubled by air pollution, and when asked specifically about bad smells in the air, 48 complainants and 43 non-complainants said they had been troubled. The important thing to note is the large proportion of non-complainants who said that they had been troubled both by air pollution and by bad smells specifically. The evaluations of intensity or qualitative character of these smells, however, differed:

The smells are:

	Very unpleasant	Quite or not noticeably unpleasant
complainants 3	27	2
complainants 2+1	23	5
non-complainants	21	24

$\chi^2 = 20.41$, df. 2, Sig. .001 level

The tendency to complain was neither matched by a tendency to complain about other aspects of the district such as shopping facilities or streets (χ^2 Sig. .9 & .7 respectively) nor related to organization membership (χ^2 Sig. .75).

More complainants (29) than non-complainants (19) had thought of moving from the area and yet the greater proportion of complainants (41) - a proportion comparable to non-complainants (45) - rated their area as an excellent, good or fair place to live. It would appear that it is only the alleged smells which trouble residents to any great extent.

Twenty six complainants and 26 non-complainants reported noticing air pollution when they moved to the area. Twenty one complainants and 13 non-complainants said they thought air pollution had got worse since the new Works were opened. Ninety one of the 104 respondents mentioned the Works as the major source of air pollution - 61 mentioned it alone. Only 4 mentioned the estuary, only 2 the old treatment plant site while 10 indicated that they had no ideas as to the source of the alleged smells.

Evaluation of the alleged smells was not related to perception of what had been done by the Christchurch Drainage Board or Works staff (χ^2 Sig. .7) - though 52 respondents said that either they thought nothing had been done or they did not know if anything had been done. Opinion as to whether the smells had been continuous, were increasing, lessening or had never been a bother was not related to the tendency to complain (χ^2 Sig. .5) but 78 respondents said the smells were either worse or had been a continuous problem. Perception of whether the smells were increasing, continuous, lessening or had never been a bother was not related to the way the alleged smells were evaluated (χ^2 Sig. .7).

Perception of the recent situation was not significantly related to respondent's sources of information (χ^2 Sig. .3), organization membership (χ^2 Sig. .5) or sense of contributing to community decisions (χ^2 Sig. .98).

The tendency to complain was not related to the effort that the Board or Works staff were perceived to have expended in trying to control the alleged smells.

Thirty spontaneous comments made by respondents (20 non-complainants) put the blame onto the Works but implied that the smells were neither intense nor noticed very often (e.g. 'not bad here', 'occasionally', 'troubled' by a smell once') - 12 spontaneous comments were less moderate (e.g. 'this week worst since came', 'getting worse').

To questions asking what weather conditions had been associated with the smells, no general agreement was discovered. Fifty five respondents volunteered 'wind direction' as important, 14 hot/calm conditions, 3 cold/frosty nights. The notion that the residents have jointly agreed upon a response was not supported. Instead it seems that the residents did not define weather conditions as an important factor.

It is interesting to note that neither the complainants nor the non-complainants had much idea of how to instigate action on a community problem: the men who were thought to be able to do something were:

	M.P.	League men	Neighbours	City Coun- cillors	d.k./n.a. none
complainants	10	6	6	2	28
non-complainants	11	7	7	0	27

Thus it would seem that there was no general agreement reached among the residents as to what they should do or who they should approach.

When asked if they had ever complained about some aspect of their area to the: newspapers, Works staff, Council or M.P., the respondents gave the following answers:

	no complaints	Complaint to:	
		Works staff	other
complainants	11	38	3
non-complainants	45	1	6

The fact that only 38 of the 52 complainants admitted to having complained to the Works staff is thought provoking. It seemed that a number of the residents whose names had been filed at the Works had not communicated intending to complain but rather intending to help the Board and Works staff in their investigations. This should have been expected as the Board had several times been mentioned in the Press as wanting the cooperation of the residents. At the very least the manner of filing details at the Works indicates a lack of communication between the Works staff and the residents.

What Status Variables Distinguished the Complainants From the Non-complainants?

It would appear that the complainants tended to have better jobs and hence were probably more intelligent and probably had higher social status than non-complainants.

	Social rating of Occupation		
	highest	average	lowest
complainants	21	17	4
non-complainants	15	10	27

$\chi^2 24.72$ d.f. 2 Sig. .001 level

More complainants than non-complainants seemed to be middle aged

	20-35yrs.	36-55yrs	56+yrs.
	complainants	14	33
non-complainants	24	17	11

$\chi^2 11.41$ d.f. 2 Sig. .01 level

The above two tables afford some clues to an explanation of why all individuals who might be exposed to air pollution do not complain to some authority. Taking into account the results of similar, previous sociological surveys, it is likely that the lower status individuals will neither know to whom to complain nor feel very effective against people in employment which they perceive to be somehow better, or more important, than their own. Younger residents are likely to have fewer civic skills and more family responsibilities than middle aged residents while the older residents are likely to lack the energy for community affairs and the physiological sensitivity to be in fact troubled (31% or 5/16 of the respondents 56+ years old rated the smells very unpleasant compared with 68% or 60/88 of the respondents under 56 years of age).

Are There Any Significant Relationships Between the Status Variables, Evaluation of the Smells & Complaint Behavior?

Length of residence was not related to the responses regarding whether the smells had got worse or not (χ^2 Sig. .7), nor age (χ^2 Sig. .3), but opinion as to when air pollution first became noticeable was:

	5+ yrs.	3-5 yrs.	-2 yrs.
	Always/when first came/d.k.	21	26
Worse since new Works	28	5	1

χ^2 d.f. 2 Sig. .001 level

N.B. A similar result obtained for age (χ^2 Sig. .001) but not for education (χ^2 Sig. .7).

Yet length of residence was not significantly associated with the frequency that respondents mentioned the Works as a source of smells (χ^2 Sig. .2) or with the evaluations of the alleged smells (χ^2 Sig. .1). Age was not associated with the alleged smells (χ^2 Sig. .2).

The following table indicates that complainants tended to have been resident in the area for more than 5 years:

	Number of years resident:		
	5+	3-5	-2
complainants	30	16	6
non-complainants	24	17	11

χ^2 d.f. 2 Sig. .001

When the Works were opened it was publicised that no nuisance was expected. A disappointed expectations factor might be an important variable. Eight respondents (6 complainants) stated that they did not feel they should just accept air pollution as part of their district. This opinion was not significantly related to occupation (χ^2 Sig. .1) though it might be related to education (χ^2 Sig. .5) - the better educated being less disposed toward accepting air pollution:

	Should accept air pollution:	
	yes	no
educational rating -	9	28
0	5	31
+	1	29

χ^2 d.f. 2 Sig. .1

Whether a respondent (or spouse) worked outside the Aranui area, apparently, had nothing to do with the way the alleged smells were evaluated (χ^2 Sig. 1.0).

What Are the Effects of Attachments to the 'Self'?

Neither relatives nor children as attachments, in the Coleman sense, which might commit respondents to their district seemed to be important (children χ^2 Sig. .8).

Complainants seemed to be more prone to worrying about the effect of the alleged smells on their health than did non-complainants:

	Worry about health	
	yes	no
complainants	12	11
complainants	8	20
non-complainants	7	40

χ^2 d.f. 2 Sig. .01

The worrying about health was not related to sources of information (χ^2 Sig. .9) or education (χ^2 Sig. .2) but it was related to a sense of contributing to community decisions (χ^2 Sig. .05).

Fourteen complainants and 6 non-complainants made spontaneous comments to the effect that the alleged smells caused headaches, made them vomit, woke them up, caused colds etc.

Again complainants seemed to be more prone to worrying about the effects of the alleged smells on their property than did the non complainants:

		Worry about property	
		yes	no
complainants	3+	16	6
complainants	1-2	10	17
non-complainants		17	30

χ^2 d.f. 2 Sig. .05

As above, the worrying about property was not related to sources of information (χ^2 Sig. .9) and, unlike above, it was not related to a sense of contributing to community decisions (χ^2 Sig. .7). Again worrying about property seemed to be related to education (χ^2 Sig. .05) - with the better educated tending to say that they worried about their property. Note that 32 respondents (15 of whom were complainants) spontaneously commented that the alleged smells had devalued their property.

What Are the Effects of Attachments to the Physical Environment?

The slight trend for complainants to have liked aspects of their physical environment rather than their social environment was not significant (χ^2 Sig. .2) - nor was the slight trend to dislike aspects of the social environment (χ^2 Sig. .2). Complaint rating was not related to dissatisfaction with the streets in the district (χ^2 Sig. .7) - nor with dissatisfaction with the local shopping facilities (χ^2 Sig. .9). It seems it was only the alleged smells which had troubled the Aranui residents to any extent.

What Impact Has the League Had?

To evaluate the influence of social pressures, a perception of the situation which was peculiar to an identifiable social grouping was sought which, in turn, had demonstrable ties with the complaint pattern. It would seem that the League was central to the dispute between the Christchurch Drainage Board and the Aranui residents and yet

a perception of the situation peculiar to the League members and those who said that they had received most of their information from the League was not identified.

The sense of contributing to community decisions had the greatest discriminatory power - which suggests organisational involvement should have been investigated further.

After looking at all the tables of cross tabulations the conclusion that suggested itself was that the respondents who were integrated into the community tended to know most about the League and tended to evaluate it most positively. These respondents, too, tended to have similar opinions regarding the alleged smell but these opinions were too similar to those for the whole sample to argue that social pressures alone generated and perpetuated the complaint behavior; it would be safer to conclude that physical factors caused residential discontent which was expressed, in the main, by residents associated with the Aranui Progress League.

Being troubled by smells did not seem to be related to any particular source of information (χ^2 Sig. .7) yet the League as a source of information would appear to be associated with complaint behavior:

	Source of information:	
	newspapers/T.V.	League
complainants	28	24
non-complainants	38	13

χ^2 d.f. 1 Sig. .05

The evaluation of the alleged smells and the perception of the situation in the past were unrelated to sources of information. It was an interesting finding, though, that the respondents who tended to admit that the League was their main source of information tended to have moved to the district more recently than those who did not (χ^2 Sig. .02). Sources of information were unrelated to education (χ^2 Sig. .3).

The number of neighbours known was not related to complaint behavior (χ^2 Sig. .1), years resident (χ^2 Sig. .1), age (χ^2 Sig. .3), education (χ^2 Sig. .98), occupational rating (χ^2 Sig. .2) or organization membership (χ^2 Sig. .1).

And organization membership was not related to complainant behavior (χ^2 Sig. .98) or evaluation of the alleged smells (χ^2 Sig. .75), the desire to move (χ^2 Sig. .2), the perception of the alleged smells in past years (χ^2 Sig. .5), number of children (χ^2 Sig. .2), education (χ^2 Sig. .2) or occupational rating (χ^2 Sig. .9).

Respondents who said that they contribute to community decisions tended to be complainants:

	Contribute to community decisions	Ordinary individual not part community
complainants	13	39
non-complainants	5	47

χ^2 d.f. 1 Sig. .05

A sense of contributing to community decisions was not related to evaluation of the alleged smells in past years (χ^2 Sig. .98) and was not related to organization membership (χ^2 Sig. .1), number of children (χ^2 Sig. .2) or age (χ^2 Sig. .1) though it was related to the tendency to worry about health (χ^2 Sig. .01) and occupational rating:

		Contribute to community decisions	Ordinary individual not part community
occupational rating	+	10	26
	0	6	21
	-	2	39

χ^2 Sig. .05 d.f. 2

Familiarity with the League did appear to be related to complainant behavior in that complainants tended to be familiar with the League.

	Unfamiliar League	Familiar & very familiar League
complainants	19	33
non-complainants	36	16

χ^2 d.f. 1 Sig. .001

Yet a sense of contributing to community decisions was not significantly related to familiarity with the League (χ^2 Sig. .1).

Oddly, respondents who had been resident for 3-5 years tended to be more familiar with the League than residents of shorter or longer standing.

		Years resident	
		3-5	-2
Unfamiliar League	5+	11	10
Fam. & very fam. League	34	22	7
	20		

χ^2 d.f. 2 Sig. .05

Familiarity, however, was not associated with age (χ^2 Sig. .2), education (χ^2 Sig. .2) or occupation (χ^2 Sig. .3).

Complainants tended to rate the achievements of the League more positively:

	League achieved something:		
	yes	no	d.k.
complainants	22	9	11
non-complainants	15	7	30

χ^2 d.f. 2 Sig. .02

The evaluation of League achievements was not associated with years resident (χ^2 Sig. .7), the number of neighbours known (χ^2 Sig. .8), a sense of contributing to community decisions (χ^2 Sig. .5) or education (χ^2 Sig. .1)

Do the Residents Feel that the Matter of the Alleged Smells has Been Freely Discussed?

As indicated in the next table, complainants tended to think that the Christchurch Drainage Board or Works staff had not freely discussed the Works with the residents:

	Discussed freely		
	yes	no	d.k.
complainants	9	30	13
non-complainants	20	16	16

χ^2 d.f. Sig. .01

Those who felt the matter had not been discussed freely, also, tended to think that they were not getting enough information:

Have sufficient information		Discussed freely		
		yes	no	d.k.
yes	yes	21	26	22
	no	5	22	7

χ^2 d.f. 2 Sig. .05

The better educated were more prone to express the need for more information:

Education		Sufficient information	
		yes	no
-		31	6
0		21	15
+		17	13

χ^2 d.f. Sig. .05

Yet perception of whether the matter had been freely discussed was not related to education (χ^2 Sig. .98).

Sixty four of 81 respondents who said that the Board and Works staff had done nothing, also, said that the matter had not been discussed freely or that they did not know if it had been discussed freely.

Perception of whether the matter had been freely discussed was associated with perception of the amount of effort that had been expended to control the trouble (χ^2 Sig. .2) or with sources of information (χ^2 Sig. .2).

The following table, however, suggests that ignorance may make demands more extreme:

		Believed smells can be:	
		eliminated	reduced
Discussed freely	yes	7	16
	no	21	19
	d.k.	7	13

χ^2 d.f. 2 Sig. .001

Thirty six of 48 respondents felt that the Board or Works staff had not discussed the matter publicly because they felt that they did not have to - the respondents, however, strongly tended to the opinion that the matter should be discussed publicly:

	Should be discussed publicly	
	yes	no
complainants	10	42
non-complainants	7	45

Including those who felt there was no need for the matter to be discussed publicly, 20 respondents expressed the sentiment that looking after the Works was the job of the Board and Works staff and that they should just get on with it.

How Do the Residents View the Public Bodies & Public Officials?

The 13 attitude items in the questionnaire were included to try to discover: a. whether individuals tended to evaluate themselves as being subordinate or superordinate to public bodies and b. how individuals evaluated public officials. Analysis indicated that complainants and non-complainants were not differentiated by the 13 items. The only conclusion that could be drawn from the data was that the respondents did tend to exhibit a distrust of public officials

FACTOR LOADINGS

Attitude items were included in the questionnaire to see if the way complainants and non-complainants view themselves in relation to public bodies (a-h) and the way they evaluate public officials (i-m) differ significantly. The first 9 items were formulated by the author while the last 4 are Horton & Thompson alienation scale items (A.J.S. 1962).

The items should, of course, have been pretested but since the author wanted to interview the sample of residents during the summer months he was not able to budget as much time as he would have liked to for this aspect of his research.

Factor analysis of the data obtained indicated that the items did not hang together in the way it was thought they might, though, it is interesting that those that did cluster were the Horton and Thompson scale items (factor one).

The individual raw scores for each item were standardized before being multiplied by the sign factor loadings squared (correctly, sign factor loadings should have been used but the squared scores would only have exaggerated any differences). Graphs of the sign factor squared scores indicated that the differences between complainants and non-complainants were not significant and so analysis was stopped at this point.

Thus no evidence was obtained which would allow the author to conclude that the attitudes of complainants toward public bodies and public officials differed from non-complainant attitudes toward the same attitude objects.

Correlation Matrix.

Variable	Colome
1. Years resident	1
2. When smells first noticed	11
3. Evaluation smells	14
4. Worry health	15
5. Worry property	17
6. Information from	29
7. Contribute Comm. dec.s	34
8. Familiar League	36
9. Know neighbours	54
10. Organization membership	56
11. Education	59
12. Occupation	60
13. Age	63
14. Complaint rating	70

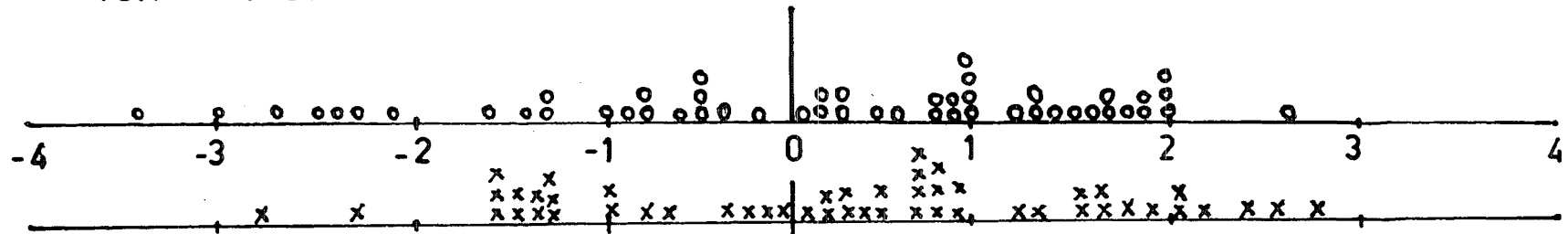
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1.														
2.														
3.														
4.		.36	.49											
5.			.51	.66										
6.														
7.														
8.							.31							
9.	.31													
10.														
11.														
12.											.33			
13.	.36													
14.														

1. Worry health (4) and Worry property (5) = largest correlation .66
2. Worry health and Worry property correlate with Evaluation smells (3) .49 and .51 respectively.
3. Association of smells with the Works (2) correlates with Worry health .36
4. Years resident correlates with age .36
5. Education correlates with occupational rating .33
6. Familiarity League (8) correlates with Sense of contributing to community decisions (7) .31.
7. The number of neighbours known (9) correlates with years resident (1) .31.

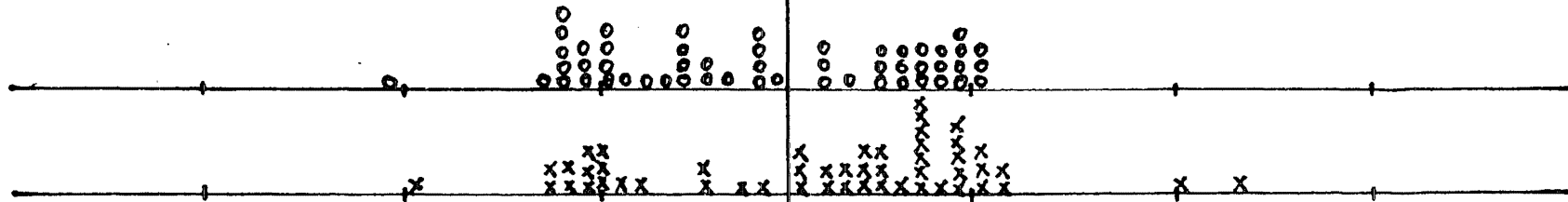
Conclusion: The fact that the perceived source of smells was a sewage treatment works could be an important factor influencing responses.
For purposes of analysis the variables can be considered independent.

COMMUNICANTS.- x NON-COMMUNICANTS.- o

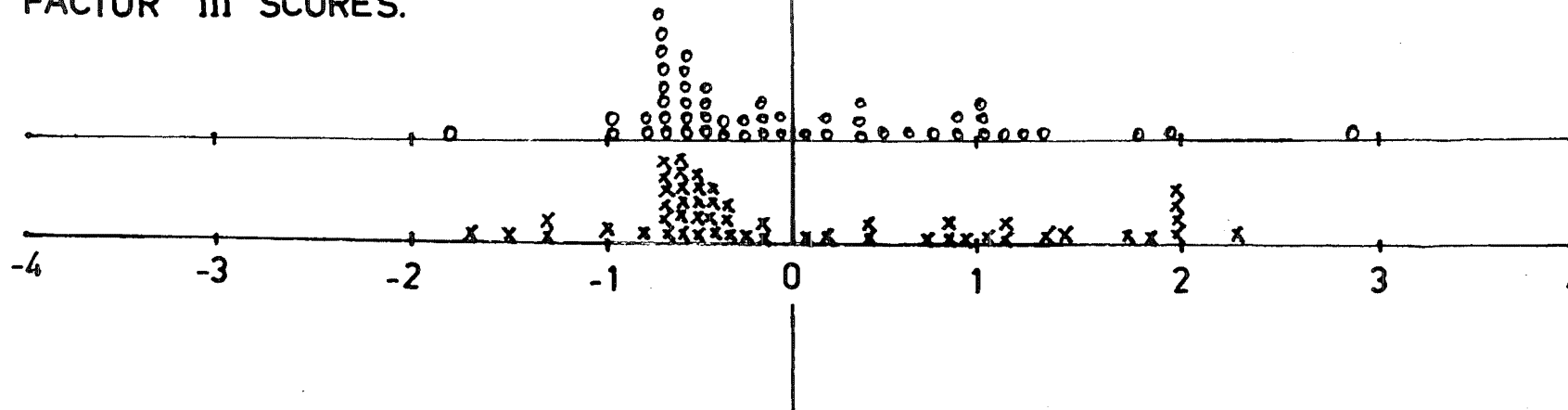
FACTOR I SCORES.



FACTOR II SCORES.



FACTOR III SCORES.



CONFIDENCE LIMITS 95% LEVEL

Variable	Complainants (Population = 156)	Non-complainants (Population=330)
1. More than five years resident	22 to 68	1030 to 2010
2. Thought of moving	36 - 80	725 - 1710
3. Rated area positively	101 - 139	2410 - 3070
4. Liked social things	61 - 118	890 - 1820
6. Disliked social things	118 - 148	1650 - 2540
8. Mentioned Works	97 - 137	1650 - 2540
9. Troubled air pollution in past	134 - 154	2150 - 2935
10. Air pollution cont. or incr.	84 - 128	1380 - 2270
11. Air pollution worse since Works	41 - 86	395 - 1260
12. Should not accept air pollution	126 - 153	2005 - 2838
13. Troubled by unpleasant smells	126 - 153	2280 - 3070
14. Very unpleasant	115 - 148	890 - 1720
15. Worry health	39 - 84	165 - 860
16. Worry property	55 - 102	660 - 1585
22. Air pollution can be eliminated	66 - 103	560 - 1260
23. Works are major source	84 - 128	1120 - 2080
24. Made some/great effort	55 - 102	860 - 1820
25. Have not discussed	67 - 112	595 - 1520
26. Feel they do not have to	44 - 89	495 - 1385
27. Should discuss	105 - 142	2040 - 3000
28. Done nothing or d.k.	112 - 144	1880 - 2740
29. Information got from League	48 - 95	430 - 1260
30. Get sufficient information	66 - 103	2145 - 2936
34. Contribute to community decisions	22 - 62	200 - 660
36. Familiar/very familiar League	76 - 120	630 - 1520
54. Know most neighbours	70 - 115	1095 - 1920
59. Plus education	36 - 80	265 - 1050
60. Higher occupation	41 - 86	595 - 1520
63. Age 36-55	76 - 120	660 - 1580
64. New Zealand by birth	112 - 144	2837 - 2970

APPENDIX V

THE LAW AND THE PROBLEM OF DEFINING KEY TERMS.

This investigation was concerned with the conflict between the Christchurch Drainage Board and the residents of Aranui. The residents defined the alleged odours from the Works as a nuisance. There is existing legislation in the New Zealand Statute Books relevant to the arguments they put forward: Town and County Planning Amendment Act 1957, section 21,

"This act applies certain controls over the use of any land or building which has one or more objectionable elements, whether of noise, smoke, smell, effluent, viabration, dust, or other noxiousness or danger or detractation from amenities either to employees or to other persons or property. Chemical works operations covered by part V of the health act 1956 are exempted from this section.

A duty is laid on any user of the land to remove or reduce any such objectionable element to such extent as is reasonably practicable and after the 1st January 1960 a local authority may require any person who is making use of such land or building either to cease that use or take such action as specified to remove or reduce that objectionable element. Provision is made for substantial fines for non-compliance with any notice and for local authorities to apply for an injunction to restrain the causing of the objectionable element" (p27 Report of the Christchurch Air Pollution Advisory Committee 1959).

Hodges (1958) notes that the Manufacturing Chemist's Association in the U.S. does not consider that air pollution exists,

"..unless concentrations (are) definitely offensive to human senses, or impairs the normal functions of the human body, or detract from the value, usefulness or enjoyment of the property".

For such legislation to be enforceable - such terms as 'noxiousness' or 'objectionable' etc. need to be defined in such a way that agreement between parties is facilitated. Yet, as Horstman, Wromb & Heller (1965) note,

"...the problem of precisely defining an offensive odour is difficult. An odour may be pleasant to one and offensive to another because of psychological associations with the odour.A working definition of an offensive odour may be: An odour that is objectionable to a majority of healthy persons exposed to its olfactory action"

Obviously definitions of this sort are not without their difficulties: terms such as 'healthy' are given statistical overtones -

what the average person thinks, what state of health the average person enjoys etc. Yet, it would seem that definitions of community troubles naturally take this form, for example:

"For purposes of this report we accept the definition of noise as 'sound which is undesired by the recipient'. This simple description emphasizes the cardinal fact that noise is subjective; a noise problem must involve people and their feelings, and its assessment is a matter rather of human values and environments than of precise physical measurement." (Wilson Report p2)

The position is neatly expressed in the following paragraph from Jonsson (1964a):

"Swedish law permits of no environmental factors which may have a disturbing effect on individual health and welfare. In the statutory provisions for hygiene, the concept of 'sanitary nuisance' has been applied to abuses arising from external environmental factors. It is not necessary that health be endangered by such factors. It suffices that they cause 'trouble' to the individuals exposed to them. However, if the external environmental factors appear to be of such a harmless nature that they do not represent a threat to the health of the individuals exposed, it will be necessary to decide whether 'sanitary nuisance' applies in such cases. This decision will depend on the frequency and intensity of the subjective trouble; firstly, the nature of the trouble; secondly, the characteristics of individuals exposed. In deciding whether a case implies 'sanitary nuisance' major importance should be attached to ascertaining the effect of disturbing environmental factors from the trouble reactions of the individuals exposed to them, they will react differently owing to the fact that between them, they possess a large number of characteristics. Obviously, it is a complicated matter to evaluate such subjectively different reactions"

(N.B. See Parrack in Handbook of Noise Control 1957 - similar argument to that formulated by Jonsson but uses paradigm to investigate and predict community reaction to noise)

Yet, the case of evaluating a public nuisance is not only influenced by individual predispositions. Social factors can enter into the problem. Consider, for example, the following extract from the Report of the Mangere Commission of Inquiry (p12):

"Transactions of the Institution of Chemical Engineers, V31 No.1 1933 at p26. This is an article by W.A. Damon dealing more directly with the Alkali Act from the alkali inspectors standpoint. The Commission desires to draw attention to the first paragraph of the introduction of

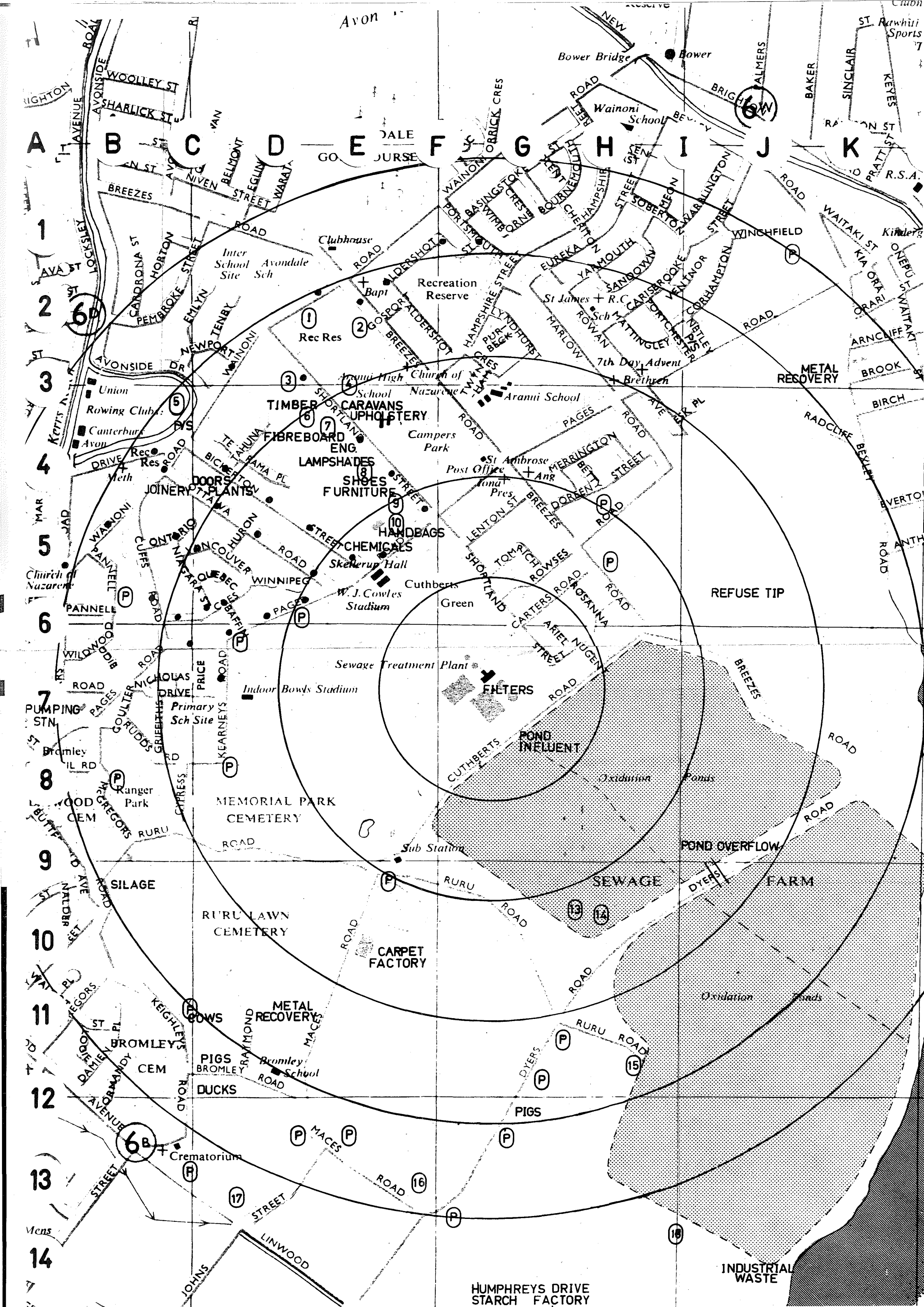
the article. This paragraph propounds the basic principles of the administration of the Alkali Act in England. Mr. Damon here says, '....there must be a tripartite compromise between (1) the natural desire of the public to enjoy an unpolluted atmosphere (2) the legitimate aspirations of manufacturers to avoid unremunerative expense and (3) the National requirements and interests'. It appears to the Commission, after reading Mr. Damon's article, that a wise administration of the English Act has resulted in the active and willing cooperation of the industrialists and that the same result could, if the administration here were similar, be expected in N.Z."

An odour problem, then, might be evaluated in terms of a cost-gain scheme to a society. Sewage treatment works are necessary for modern cities. Odour is inevitably associated with sewage. Residents must be prepared to tolerate some odour from such plants.

The sociological problem remains, however, to identify the social variables, and their states, which predict a neighbourhood reaction to different intensities of community troubles occurring within the limits of defineable neighbourhood conditions. The stumbling block in the way of solving this problem is the use of such words as 'offensive', 'objectionable', 'trouble', 'nuisance' etc. The Horstman-Wromble-Heller solution(1965) that: 'a working definition of offensive odour may be - an odour that is objectionable to a majority of healthy persons exposed to its olfactory action' is not very helpful. The way residents evaluate odours may be influenced as much by attitudes towards the sources of the odours as by the objective characteristics of the odour stimuli.

Even measurement of objective attributes of odour stimuli faces certain difficulties. Humans are more sensitive than measuring instruments for some odours. Odours may be intermittent. And hedonic evaluations can change with the intensity of the same odour stimuli. Paradigms that have been developed in the past to evaluate community odour troubles suffer from lack of attention to these problems. For example: McCord & Witheridge (1949) write (p252):

"Let it be assumed that numerous complaints are arising from the citizenry of a residential district near a highly industrialized area. Of the industries potentially involved, there is more than one plant of the same sort of industrial activity. Some of the complaints have been made by the Public Health Department, others to the councilmen of the district chiefly involved. There is no unanimity of opinion as to the source of the odour. To a mild extent the community



Avon

Bower Bridge

NEW

A B C D E F G H I J K

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Wainoni School, Recreation Reserve, Clubhouse, Inter School Site Sch

St James + R.C. Carisbrooke, 7th Day Advent Brethren, Aranui High School, Church of Nazareth

St Ambrose, Post Office, Tomat Pres, Campers Park, Fibreboard Eng, Lamps Shades, Shoes Furniture

W. J. Cowles Stadium, Cuthberts Green, Sewage Treatment Plant, Filters, Pond Influent, Pond Overflow

Indoor Bowls Stadium, Primary Sch Site, Memorial Park Cemetery, Ruru Lawn Cemetery, Carpet Factory

Bromley School, Pigs Bromley, Ducks, Crematorium, Metal Recovery, Industrial Waste

Starch Factory, Humphreys Drive

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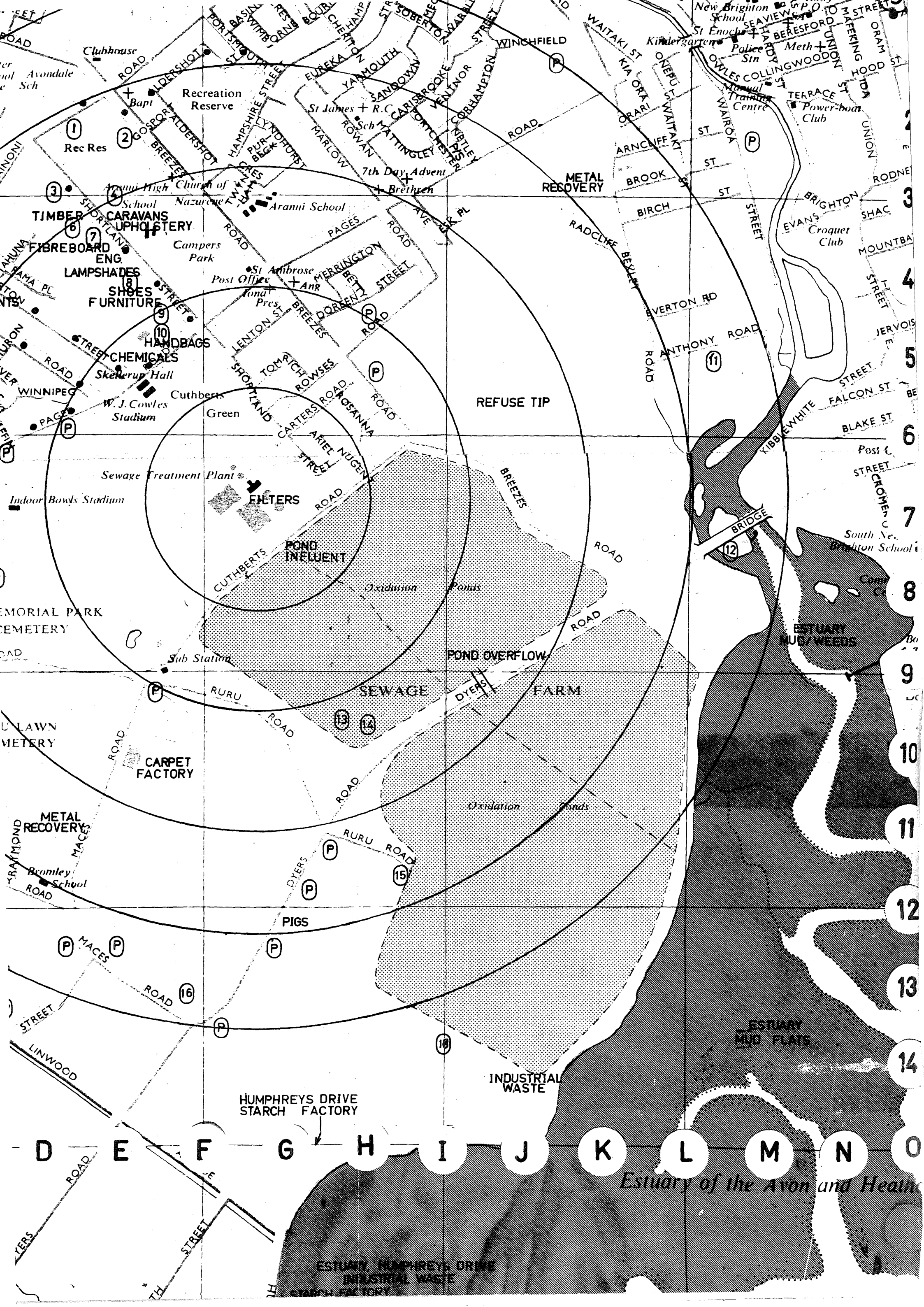
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Estuary of the Avon and Heathcote

ESTUARY, HUMPHREYS DRIVE INDUSTRIAL WASTE STARCH FACTORY

ESTUARY MUD FLATS

ESTUARY MUD/WEEDS

POND OVERFLOW

FARM

SEWAGE

Oxidation Ponds

Oxidation Ponds

POND INFLUENT

FILTERS

Sewage Treatment Plant

REFUSE TIP

METAL RECOVERY

HUMPHREYS DRIVE STARCH FACTORY

CARPET FACTORY

Indoor Bowls Stadium

W. J. Cowles Stadium

Skellern Hall

SHOES FURNITURE

LAMP SHADES

FIBREBOARD ENG.

CARAVANS UPHOLSTERY

Young High Church of Nazareth

Arann School

Recreation Reserve

Clubhouse

Bapt

7th Day Advent

St James + R.C. CARISBROOKE

St Enoch + G.P.O.

New Brighton School

St James + R.C. CARISBROOKE

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