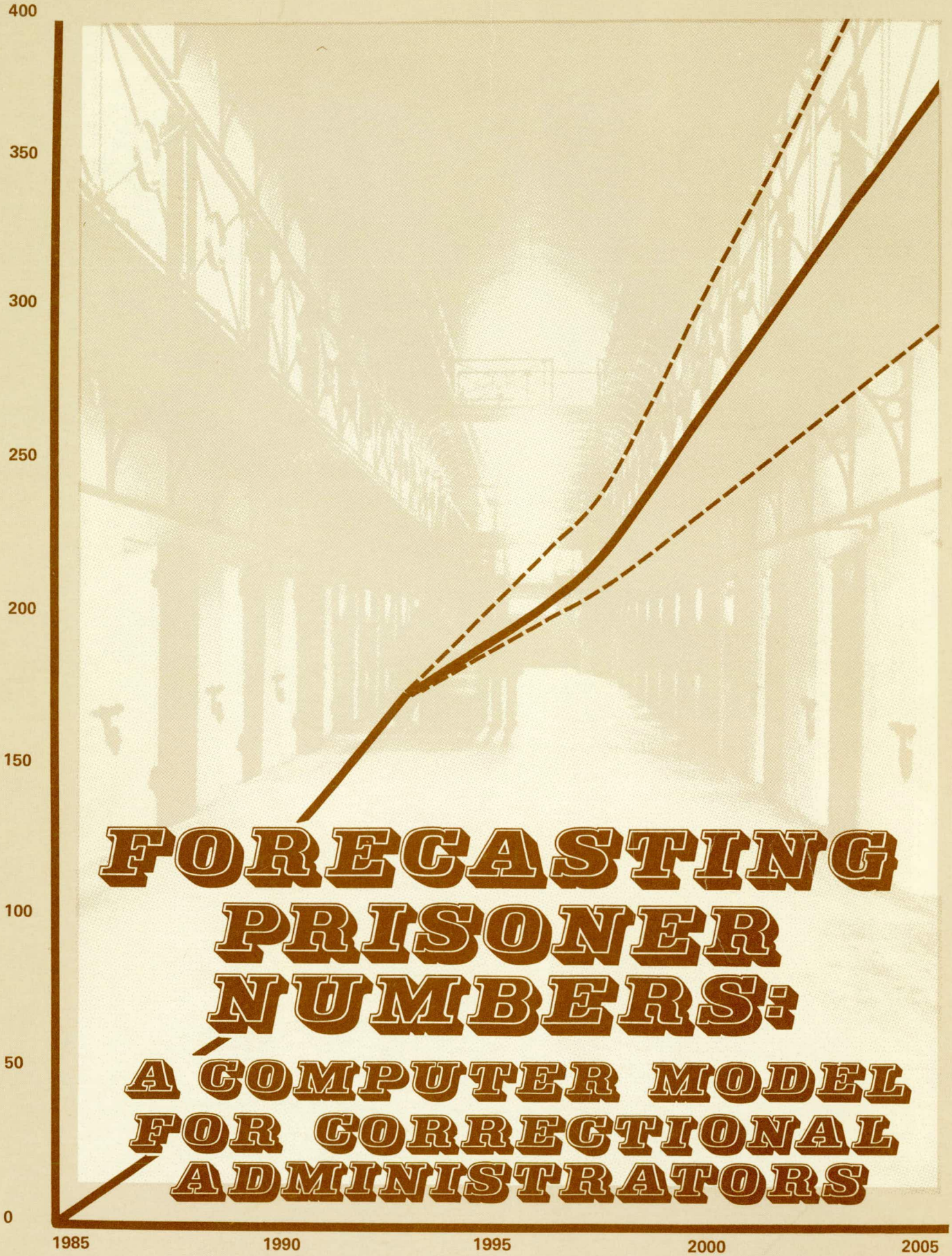

FORECASTING PRISONER NUMBERS: A COMPUTER MODEL FOR CORRECTIONAL ADMINISTRATORS

JOHN WALKER

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THE AUSTRALIAN INSTITUTE OF CRIMINOLOGY

FORECASTING PRISONER NUMBERS:

A COMPUTER MODEL FOR CORRECTIONAL ADMINISTRATORS

D. V. Barry Room
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Acknowledgments

This is the second edition of this publication. Since its first publication in October 1984 this work has formed the basis of forecasting not only in its original context, Victoria, but also in Queensland and the Australian Capital Territory. Work is also in progress on adapting the model to the New Zealand context. The author would like to thank all the people whose helpful comments and practical assistance have been incorporated into this project. Certain individuals, in particular, should be singled out: Charlie Rook of the Victorian Office of Corrections for his enthusiastic commitment to the original model, and Graham Simpson of the New Zealand Ministry for Justice, and Mike O'Leary of the Queensland Prisons Department, for their invitations to apply the model to other jurisdictions, which have inspired numerous improvements to the model.

J. Walker

Foreword

The Australian legal and penal system, despite the unfortunate impression it sometimes gives, via the media, to the public, is constantly changing and reacting to new developments. For example, the Australian police forces have had to cope with increases of something like 300 per cent in certain categories of reported assaults,* 600 per cent in robberies and 400 per cent in break-and-enters over the last 20 years, not to mention traffic offences of which several new species have been made law in that time. Similar proportionate increases have taken place in the numbers of court hearings and charges heard in the same period. Penal institutions have taken their share of the 'output' of these proceedings, and, even with increasing use of non-custodial penalties, prisons have catered for something like a 40 per cent growth in daily average numbers of prisoners. Furthermore, largely because prisons are so labour-intensive, the average cost per prisoner has risen by something like 250 per cent in real terms during the same period, even though by and large we have reduced the capital component of these costs by cramming more prisoners into the same increasingly crowded and outdated prisons.

Much of the increase in these numbers is due to growing population, so that, with an increasing tax-base, the community has been able to provide for commensurate increases in the numbers of police, judicial officers and correctional facilities. However, as in other Western countries, our correctional administrations are currently under particular pressure as prisoner numbers grow in spite of strenuous efforts to divert offenders to non-custodial forms of punishment. 'Demand' for prison accommodation has almost everywhere outstripped supply, but because of the economic and financial constraints applying to state governments at this time there is great reluctance to commit the funding required to construct more accommodation without considerable study of the whole range of options.

This monograph is designed to assist in the identification of future trends in prisoner numbers, both in the presence and absence of diversionary policies such as community-based corrections or prisoner early-release schemes. The selection of policy mixes appropriate to particular circumstances depends on relative costs and degrees of public acceptance of the policy options, and these in turn depend on the circumstances and precise

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* These figures are based on tables in Source Book of Australian Criminal & Social Statistics 1900-1980, Satyanshu K. Mukherjee, Evelyn N. Jacobsen and John R. Walker, Canberra: Australian Institute of Criminology, 1981.

details of the policies themselves, so only the analytical techniques, with appropriate examples, can be shown here. The reader should not infer any recommendations in relation to the actual policies discussed. It is intended, however, to show how policy options can be compared with a view to determining the most appropriate options, particularly in a public climate in which the costs of imprisonment are seen as an undesirable burden on the taxpayer while the alternatives to imprisonment are sometimes seen as inadequately protecting that same law-abiding taxpayer.

Part One consists of a discussion, with examples from Victoria and Queensland, of the statistical relationships between the demographic structure of the general population and the composition of the 'clientele' of the justice and penal systems. Evidence is produced in support of the contention that these relationships are sufficiently stable over time to be used in projecting future client numbers. Part Two is a very brief discussion of the types of model which have traditionally been used in this area of forecasting, and a summary of the sequential structure of the model eventually developed for forecasting the Victorian and Queensland corrections populations. Part Three discusses how these types of models should be used and presents examples of the range of outputs obtained.

PART I

THE KEY FEATURES OF A CORRECTIONS FORECASTING MODEL

Introduction

This is a subject which has only recently become a public issue, not only in Australia but also in the United States, where much effort has been directed to producing reliable forecasting models since rapid increases in prison populations made the construction of additional facilities necessary.

Initial attempts at forecasting prisoner numbers were based on simple trend extrapolation, and failed miserably as crime rates soared above previously known values. On reading of escalating crime rates, members of the public, politicians and the judiciary all tended to demand greater punishment for offenders, completely overlooking the fact that much of the escalation was caused by juveniles for whom custodial sentences were entirely inappropriate, but the resulting longer sentences added further to the burdens on the prisons.

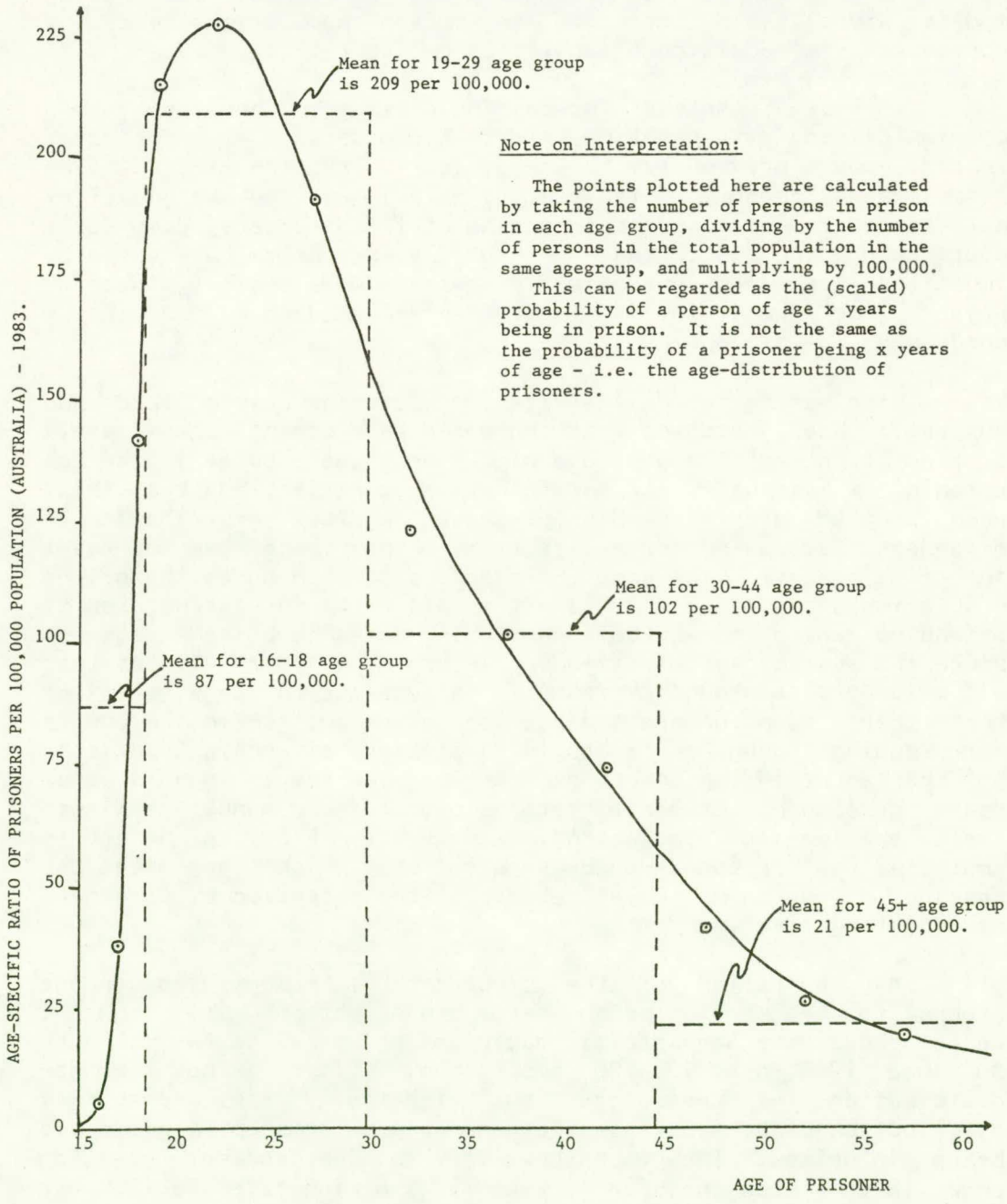
More enlightened analysts in both the United States and Australia[1] have observed that two world wars coming approximately a generation apart produced a highly pronounced bulge in the age pyramid of virtually all participating countries, and that this, when coupled with the highly skewed age/sex distribution of offenders, accounted for a very large proportion of the increases in crime rates. The same observation, carried on to the prison population, suggested that some time after the increased rates of offending would come commensurate increases in prisoner numbers since the average age of offenders is around 19 years whereas that of prisoners is around 29 years.[2] This is due to the simple fact that there is an understandable lack of enthusiasm in the courts for sending young, particularly first-time, offenders to prison, so that an offending cohort of young persons has to spend several years developing criminal records before their numbers begin to swell the prison populations. However, this lag effect is amplified as prisoner numbers also stay high long after the passing of the crime 'wave' because of the retention of prisoners serving long terms.

An indication of the propensity of persons of given age groups to be serving prison terms can be obtained from Figure 1 which shows the age-specific ratios of prisoners in Australia on 30 June 1983 per 100,000 population. This is not the age-distribution of prisoners, but effectively the probability distribution of persons from the general population of a given age being in prison. The graph shows very low imprisonment rates for under 18 year olds and over 45 year olds, medium rates for 18 year olds and 30-44 year olds and very high rates for 19-29 year olds. Clearly, when the 19-29 age group is a significant proportion of the general community a high prison population should be expected, if this graph is consistent over time.

This figure itself suggests a very simple forecasting model

Figure 1

AGE-SPECIFIC RATIOS OF PRISONERS PER 100,000 POPULATION
BY AGE - AUSTRALIA 1983



Source: Walker, J. and Biles D., Australian Prisoners 1983, Australian Institute of Criminology, Canberra, 1984.

for prisoner numbers. One could obtain forecasts of the number of persons in the general population in the 16-18, 19-29, 30-44 and 45+ age groups and multiply these figures by the means suggested in the graph, that is, 87, 209, 102 and 21 per 100,000 respectively. This model, however, could not take account of changes in any factor other than population change and would therefore be of little practical value since a wide range of policing, legislative and penal policies can clearly also affect imprisonment rates, particularly in the medium-long term. Furthermore, for the same reasons, even if similar models were constructed for non-custodial sentences, based on age-specific rates, the combined models could not adequately assist the evaluation of these alternative forms of adult correction.

Adult corrections forecasting models therefore must incorporate at least four observed features of the demography, crime and justice fields if they are to be capable of adequately describing the system by which people come to serve corrective sentences:

* The number of persons in each age/sex group in the general population is reasonably predictable five, ten or even 20 years into the future so long as migration remains within expected bounds.
* The proportion of persons in each age/sex group in the general population which will be proceeded against for a given offence-type is reasonably stable over time, but may be modified by changes in the law, in social attitudes or in socio-economic conditions.
* The severity and nature of sentences handed down for a given offence-type are stable over time, but may be modified by legislation or by judicial practice.
* The rules governing parole and remission are stable over time, but may be modified by legislation or by the changing practices of corrections administrators or parole boards.

These four features are dealt with in detail below.

Forecasting the Future Age/Sex Distribution of the Population

Although there have been cases of demographic forecasting being woefully inaccurate in the long term, techniques developed since the 1950s have made it feasible not only to produce reliable projections of total populations, based on fairly sophisticated assumptions about trends in births, deaths and migration, but also to produce far more detailed projections of, for example, labour forces, rural and urban population, school enrolments and households.[3] Such forecasts are generally built upon age and sex specific forecasts of population combined with knowledge of age/sex specific participation rates in the labour force, school or household formation. Improved knowledge of inter-relationships between population and economic and social factors has resulted in greater confidence in the results of these models and, particularly in developed countries such as Australia, the basic parameters are so stable (for example, birth rates, death rates)

that forecasting population even at a detailed age/sex disaggregated level has become largely a problem of forecasting the composition of migration flows. To some extent, of course, these are government controlled so that even this problem is reduced to manageable proportions.

For some years the Australian Bureau of Statistics has been developing population forecasting models for Australia[4] and its component states and territories. They provide several sets of projections based on differing assumptions about fertility, mortality and migration. For example, the alternative fertility assumptions used in the four basic ABS models are:

Total Fertility to increase from 1936 per 1000 women in 1981 to 3020 by 1985 and to decline to a low of 1900 by 1987, remaining constant at 1900 to the year 2021.	OR	Total Fertility to gradually increase from 1936 per 1000 women in 1981 to a long term replacement level of 2110 in 1987, remaining constant thereafter.

Mortality is assumed to continue its slow decline, giving life expectations at birth of 72.25 and 73.42 years for males in 1985 and 2020 compared with a 1981 figure of 71.38 years. The corresponding values for females are 78.42 years in 1981, 79.58 in 1985 and 82.64 in 2020. No alternative assumptions are given.

Migration alternatives are: 75,000 or 125,000 persons net per year.

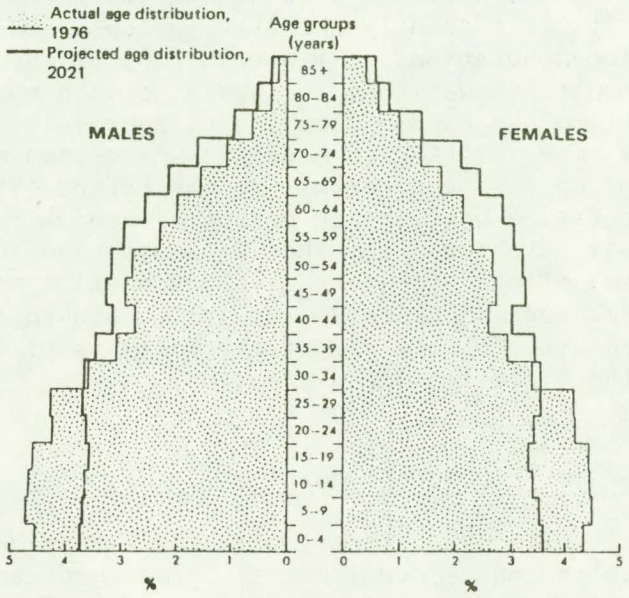
The difference between the maximum and minimum total population figures for Australia under these projections is of the order of 8 per cent at year 2000 and 17 per cent in the year 2020. Since government planning policies are generally geared to the relatively shorter end of this scale the likely range of error in corrections planning, resulting from incorrect population growth assumptions, will be small. However, even an 8 per cent increase in population expectations would imply around 800 extra prisoners to be housed in Australia.

It is generally expected that Australia's population, having experienced a post-war baby boom in the late 1940s/early 1950s and a significant immigration movement in the post-war period, will 'age' considerably in the next few decades, that is, the proportion in the 45+ age group will increase.[5] Figure 2 shows age-pyramids for Australia in 1976 and (projected) 2021 and clearly outlines the shift in population this will entail. Paradoxically with the reduction in the numbers in the crime-prone juvenile and young adult age groups and the increase in the elderly, we are likely to be faced on the one hand with reducing actual crime levels and on the other an increased public consciousness and fear of victimisaton. This speculation is however not the subject of this monograph.

The Victorian Department of the Premier and Cabinet

Figure 2

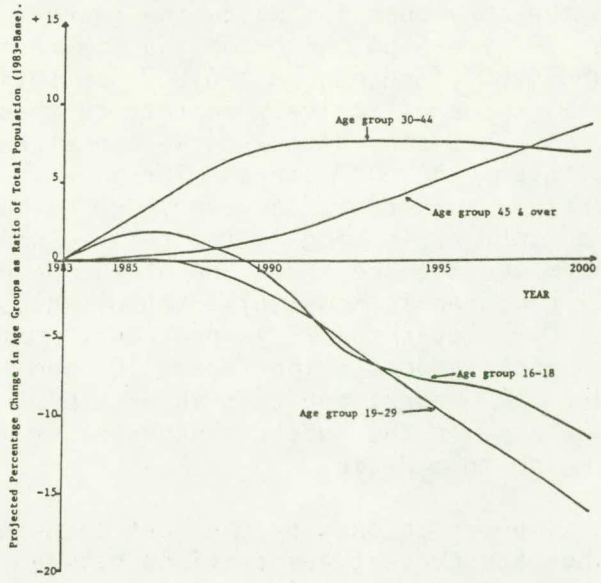
POPULATION PYRAMID SHOWING THE AGE AND SEX DISTRIBUTION OF AUSTRALIA AS AT 30 JUNE 1976 AND THE PROJECTED POPULATION AS AT 30 JUNE 2021 ASSUMING 50,000 IMMIGRANTS PER ANNUM



Source: Howe, A.L. (ed.), Towards an Older Australia, University of Queensland Press, Brisbane, 1981.

Figure 3

PROJECTED CHANGES IN VICTORIA'S AGE COMPOSITION 1983-2000



Source: Preliminary Population Projections, Victoria, 1981-2001, Department of the Premier and Cabinet, Melbourne, 1982.

produced its own population projections in 1982[6] based on the ABS method, and these graphically show how the key age groups are expected to vary in the next two decades. Percentage changes from the 1983 population structure are shown in Figure 3 in the same age groupings as used in our simple prisoner forecasting model earlier, that is, 16-18, 19-29, 30-44 and 45+ years of age. As shown earlier it is currently the 19-29 group which contributes most to the prison population, so Victoria can, on the fact of it, expect an eventual reduction in potential prison populations of about 16 per cent in per capita terms. (Of course, with a growing population this may still mean more prisoners than at present.) However, the graph also indicates that the period 1983-1987 will be one of increasing pressure on prison accommodation and since there is already pressure on that accommodation in 1983 it is clear that some effort to increase accommodation and/or reduce throughput of prisoners is urgently required. Subsequent sections of this monograph will follow through the analysis of the range of options facing the Victorian administration.

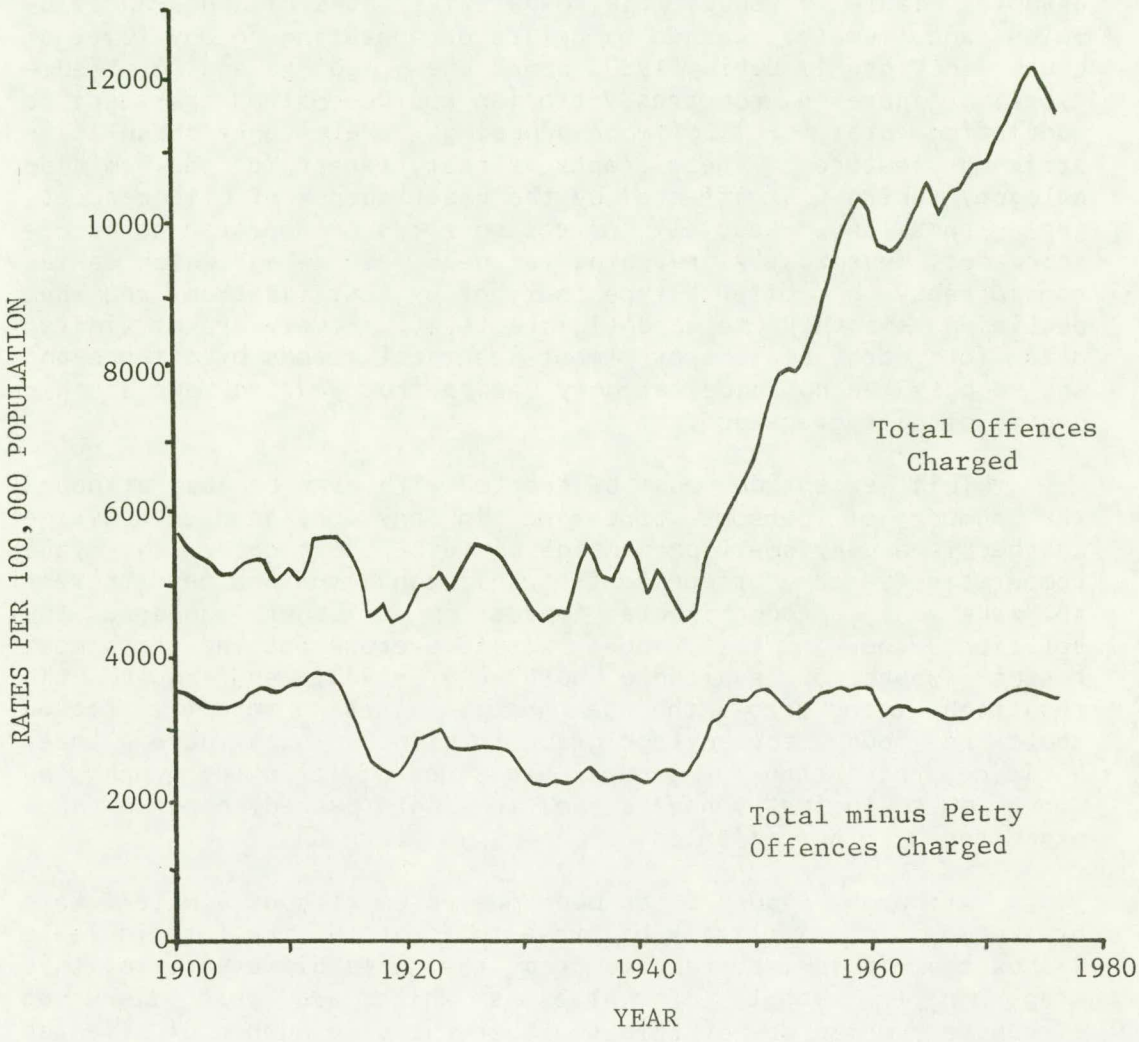
The Number of Persons Proceeded Against

Mukherjee[7] has shown that, with the exception of traffic offences, of which many new species have evolved during the period, per capita crime rates in Australia have hardly varied during the whole of the twentieth century particularly when age and sex are taken into account. Figure 4 shows the volume of offences charged before Magistrates' Courts per 100,000 population aged 10 years and over for Australia between 1900 and 1976. The graph also shows the trend resulting if 'petty' offences (almost entirely made up of traffic offences) are taken out. This trend shows variation between around 2000 and 4000. However, as Mukherjee shows, the exceptional years between 1915 and 1945, covering two world wars and the Great Depression, account for most of the years when the trend was below 3000 and the early years of the century are the only ones for which the trend rose above 3500. Over the last 30 years of the graph the figure fluctuates only between 3000 and 3500 offences per 100,000 population aged 10 and over. Since this curve effectively represents these offences for which persons may be sent to prison we can already derive some reason for optimism in our search for a basis of forecasting prisoner numbers. Mukherjee, however, goes further into the realms of demography by looking at the relationships between the number of offences and the age structure of the population. Using a simple purely demographic model of total offences he obtained a correlation of 0.97 over the 77 year period. Unfortunately the key variables (total population aged 10 and over and the percentage under 10 years) are less than helpful and there is a hint of circularity in the model. Mukherjee is forced to leave the question hanging in mid air.

Although time-series data of the sort used in Crime Trends[8] is useful to indicate general associations between variables, far more complex statistics are required to establish correlations of the type required for forecasting prisoner numbers. In particular, we know intrinsically that offence type and age and sex of

Figure 4

VOLUME OF OFFENCES CHARGED BEFORE MAGISTRATES' COURTS PER 100,000 POPULATION AGED 10 YEARS AND OVER: AUSTRALIA 1900-1976



Source: Mukherjee, S.K., Crime Trends in Twentieth-Century Australia, George Allen & Unwin/Australian Institute of Criminology, 1981.

offender are important indicators of whether a person is likely to commit offences,[9] but time-series data at this degree of disaggregation is difficult to obtain. Fortunately, even when we look at a single year's data for one jurisdiction, we find that distributions by age and offence type are generally so smooth across the age ranges that they are convincing testimony to the stability (at least in the short term) of the relationships revealed. For example, Table 1 shows the comparative rates of appearances by males and females warned by police or appearing in any level of court in Victoria during 1980, by 22 age groupings and 16 offence types. Figure 5 compares Victorian and Queensland age-specific conviction rates for 11 offence groupings. (Males only shown). The striking feature of these graphs is that, except for the homicide category which is affected by the small number of offences, all the graphs show smoothly increasing rates of appearances as age increases, eventually reaching a peak, at an age which varies considerably by offence type, but not by justification, and then declining smoothly to a negligible level. Five years of similar data for each state show almost identical trends by offence and age - only the homicide category varies from year to year at this degree of disaggregation.

This exception must be treated with care because although the number of persons appearing in any one year on homicide charges is a very small percentage of total court cases, they face comparatively long prison sentences if convicted and tend thereby to make a disproportionate impact on prisoner numbers. The solution used in this model was to average out the three most recent years of available data, 1978-1980, and smooth the resulting trend across the age ranges. Since no intuitive reason could be found for any age group to simultaneously have a lower homicide rate than the groups both sides of it in the graph, the curve must logically have a similar single peaked shape to those exhibited by other offences.

Although Figure 5 has been presented without a male/female breakdown, for simplicity of presentation only, the data in Table 1 show that it is important to treat the sexes differently at this stage in the model. For reasons which are well discussed elsewhere[10] women do not commit either the same number of offences as men or the same types of offences with the same frequency. In virtually every jurisdiction in the world the number of female prisoners is far less than the number of males. Any prisoner forecasting model must therefore take account of this at the appropriate stages in computation.

Although Victorian offender data have been presented in this discussion of the model, and one could as a first order approximation assume it applies to other States, it is a relatively simple matter to obtain and replace it by similar data from other jurisdictions. Indeed, if projections are required for another jurisdiction it is probably advisable to do so, since although radically different patterns of criminal behaviour are unlikely to occur between jurisdictions, it may well be true that reporting, policing, legislative or penal differences occur which affect the various parameters of the model.

Table 1

NUMBER OF PERSONS CONVICTED OR WARNED BY AGE, SEX AND MOST SERIOUS OFFENCE
RATE PER 100,000 POPULATION - VICTORIA 1980

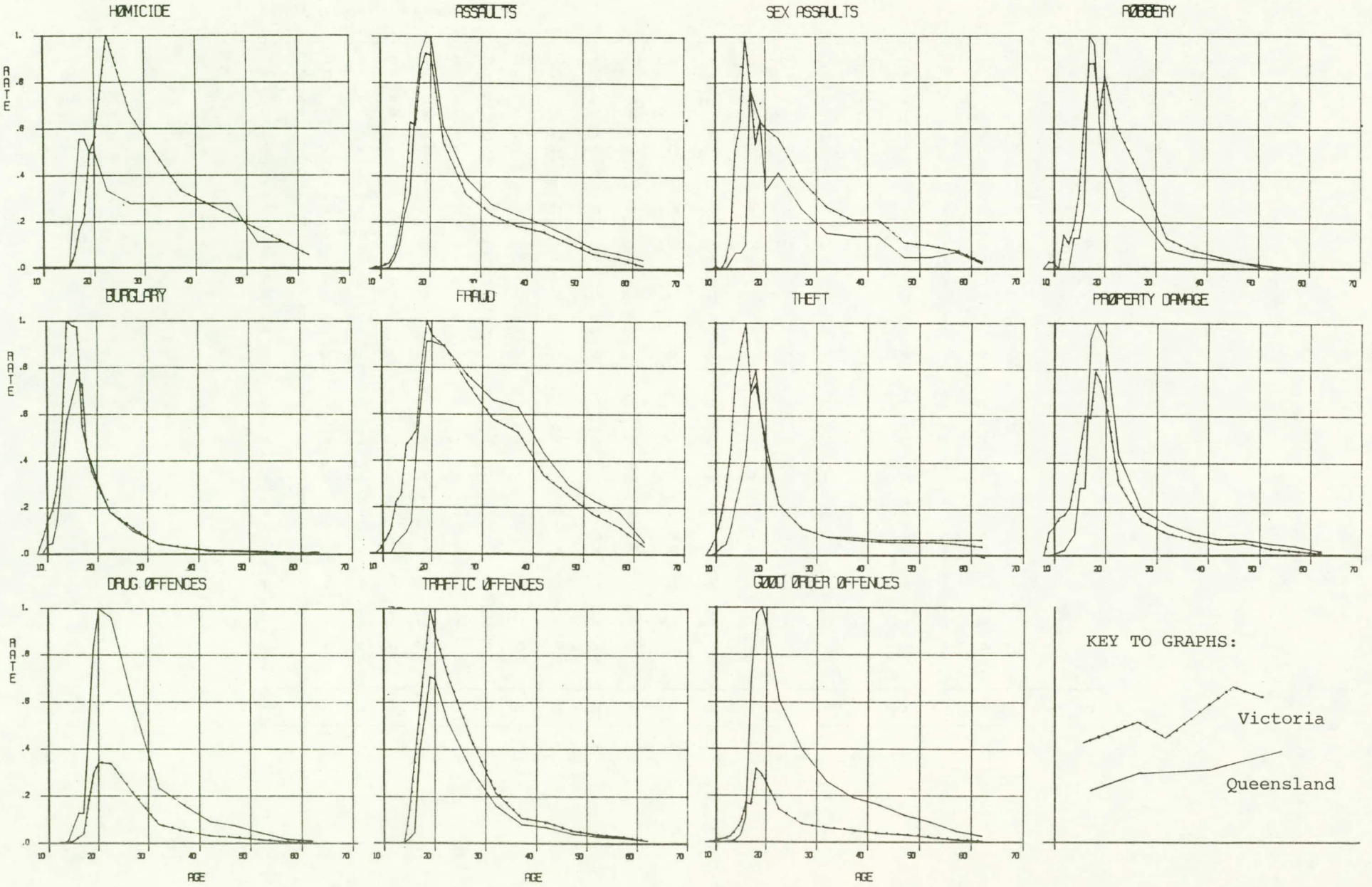
Age	<9	9	10	11	12	13	14	15	16	17	18	19	20	21-4	25-9	30-4	35-9	40-4	45-9	50-4	55-9	60+	TOTAL
Homicide*																							
M	0	0	0	0	0	0	0	0	1	3	4	9	10	18	12	9	6	5	4	3	2	1	4
F	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	0	0	0	0	0
Assaults																							
M	0	5	5	10	19	49	112	221	445	435	584	634	610	361	221	163	131	113	84	49	33	12	139
F	0	0	0	0	0	6	30	48	62	67	34	60	11	23	16	14	12	4	4	3	0	0	11
Sexual Assault																							
M	0	0	2	0	5	20	73	89	142	114	76	91	48	59	37	22	20	20	7	7	10	3	25
F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Against Person																							
M	0	0	0	2	0	0	5	2	14	13	36	38	54	35	13	7	4	4	0	0	0	0	7
F	0	0	0	0	0	0	3	0	2	0	2	2	0	1	3	0	0	0	0	0	0	0	0
Robbery etc																							
M	0	2	2	0	11	8	14	25	47	66	66	50	62	45	30	10	6	4	2	1	0	0	15
F	0	0	0	0	0	3	0	3	5	5	5	2	0	3	1	0	0	0	0	0	0	0	0
Burglary																							
M	2	102	229	311	477	918	1665	1633	1620	907	745	585	498	303	185	71	46	22	25	18	8	2	224
F	0	10	22	31	44	87	97	90	88	61	28	31	46	22	10	5	5	4	3	0	0	0	14
Fraud etc																							
M	0	0	5	13	22	49	56	103	109	117	180	219	206	195	160	127	114	74	55	37	25	7	75
F	0	0	2	8	0	6	18	27	83	55	75	123	108	83	54	44	40	32	19	12	3	0	28
Receiving																							
M	0	2	22	24	48	98	144	250	190	195	234	257	223	156	96	61	39	34	23	16	6	2	61
F	0	2	2	0	2	18	27	48	26	17	28	28	35	24	13	9	7	5	3	2	0	0	8
Other Theft																							
M	3	129	292	598	1025	1639	2747	3125	3576	2413	2540	1976	1403	681	347	235	212	183	184	201	179	131	554
F	0	45	51	189	398	946	1425	1405	1136	522	527	443	366	281	254	260	229	264	201	224	214	92	263
Property Damage																							
M	1	60	74	97	105	124	195	278	361	354	474	446	392	189	88	57	40	29	32	17	11	5	87
F	0	5	11	8	11	15	21	18	20	14	14	14	5	13	5	9	7	3	3	5	1	0	6
Government/Justice																							
M	0	0	0	5	0	2	17	57	201	173	262	244	234	172	66	55	39	25	18	13	5	3	50
F	0	0	0	0	2	3	0	18	23	11	17	11	32	19	11	7	6	0	1	1	0	0	5
Prostitution																							
M	0	0	0	0	0	0	0	0	0	0	11	22	68	41	34	39	24	14	14	5	4	0	14
F	0	0	0	0	0	0	0	3	5	5	127	296	462	347	241	104	25	25	2	0	0	0	70
Offensive Behaviour																							
M	0	0	0	0	2	5	26	109	339	407	1112	1114	934	503	222	129	89	61	69	36	28	11	155
F	0	0	0	0	0	6	6	9	20	40	86	132	55	44	18	9	12	9	4	3	0	0	13
Possession of Weapons																							
M	0	0	2	24	34	75	76	135	221	175	316	316	243	142	91	71	55	42	43	24	14	7	64
F	0	0	0	0	0	0	0	3	0	2	11	8	0	4	4	3	1	0	0	0	0	0	1
Good Order																							
M	0	28	38	73	99	124	286	336	510	460	677	521	449	213	177	168	177	146	101	81	35	12	141
F	0	0	0	2	8	15	27	39	47	69	81	23	20	20	11	11	12	10	7	4	3	0	11
Drug Offences																							
M	0	0	0	0	2	8	5	20	50	78	347	585	673	660	407	156	99	61	47	27	10	4	138
F	0	0	0	0	0	0	0	3	14	32	75	89	117	122	55	14	10	6	3	1	0	0	21
Traffic Offences																							
M	0	0	0	0	0	0	75	6000	15000	24000	33000	42000	37500	30000	18750	9000	4500	3750	2250	1500	1125	375	8370
F	0	0	0	0	0	0	0	750	1500	2250	3000	3750	4500	3750	2250	750	375	375	375	375	0	0	975

* Smoothed average of 1978, 1979 and 1980 data.

Source: ABS Victoria - unpublished data.

Figure 5

COMPARATIVE RATES OF APPEARANCES BY MALES WARNED BY POLICE OR APPEARING IN ANY LEVEL OF COURT, BY MOST SERIOUS OFFENCE AND AGE, VICTORIA AND QUEENSLAND, 1982.



The Disposition of Convicted Persons

Courts are subject to such a range of case-law and legislated constraints in imposing sentence, that percentage distributions across the range of offence-types must be relatively constant over time, except where deliberate variations are made in reaction to changing social and political circumstances. Only the value of fines imposed would be expected to vary systematically over time, because of inflation, and in this area the legal limits are adjusted from time to time to reflect this fact of life. Because of the differing applications of correctional theory, however, it is clear that the percentages assigned to the different dispositions will vary from jurisdiction to jurisdiction. Figure 6 compares Victoria and Queensland in this respect, and Table 2 show the proportions of the various disposition-types for Victoria 1980. Examination of trends indicate that these proportions were stable at least since 1976 when statistics of this type were first available.[11]

It is interesting at this stage to see if some insight can be gained by comparing Figures 5 and 6. The offences for which prison is the most frequent disposition are homicide, other offences against the person, and robbery and extortion. These are all offences involving threats or actual violence to the person and, other than robbery, are offences more characteristic of adult offenders than juveniles. Other offences where imprisonment is used to any appreciable extent (offences against government and justice, the property offences of burglary, fraud and receiving, and even the drug offences) tend to dispose a far higher proportion of convicted offenders to non-custodial sentences such as probation, fines or police warnings. Some of these offences are far more likely to be committed by juveniles, and the graphs (and commonsense) suggest that either the offence has to be particularly serious or the offender must have a particularly serious prior record before the imprisonment penalty is used in their cases.

Here then is the mechanism by which the age-distribution of offenders is not at all the same as that of persons liable to be imprisoned.

Although these proportions were stable during the period 1976-80, it is interesting to select some examples of how significant changes may occur over time which could have major effects on prisoner numbers. In the legislative area, maximum penalties for the Federal offences of importation and possession of illegal (drug) imports were doubled in 1978, making imprisonment more likely to be administered in these offences, and resulting in much longer terms in gaol than under the previous guidelines. Proposed 'decriminalisation' of prostitution might well result in a reduction of the numbers sent to prison for these offences. A different type of example, but one of quite major importance in terms of sheer numbers of prisoners, is that of the fine defaulter, that is, someone originally fined but being unable, or preferring not, to pay the fine. These persons presently serve short prison sentences, averaging 23 days in

Figure 6

DISPOSITION OF CASES BY OFFENCE TYPE: PERCENTAGE DISTRIBUTIONS FOR VICTORIA AND QUEENSLAND, 1982.

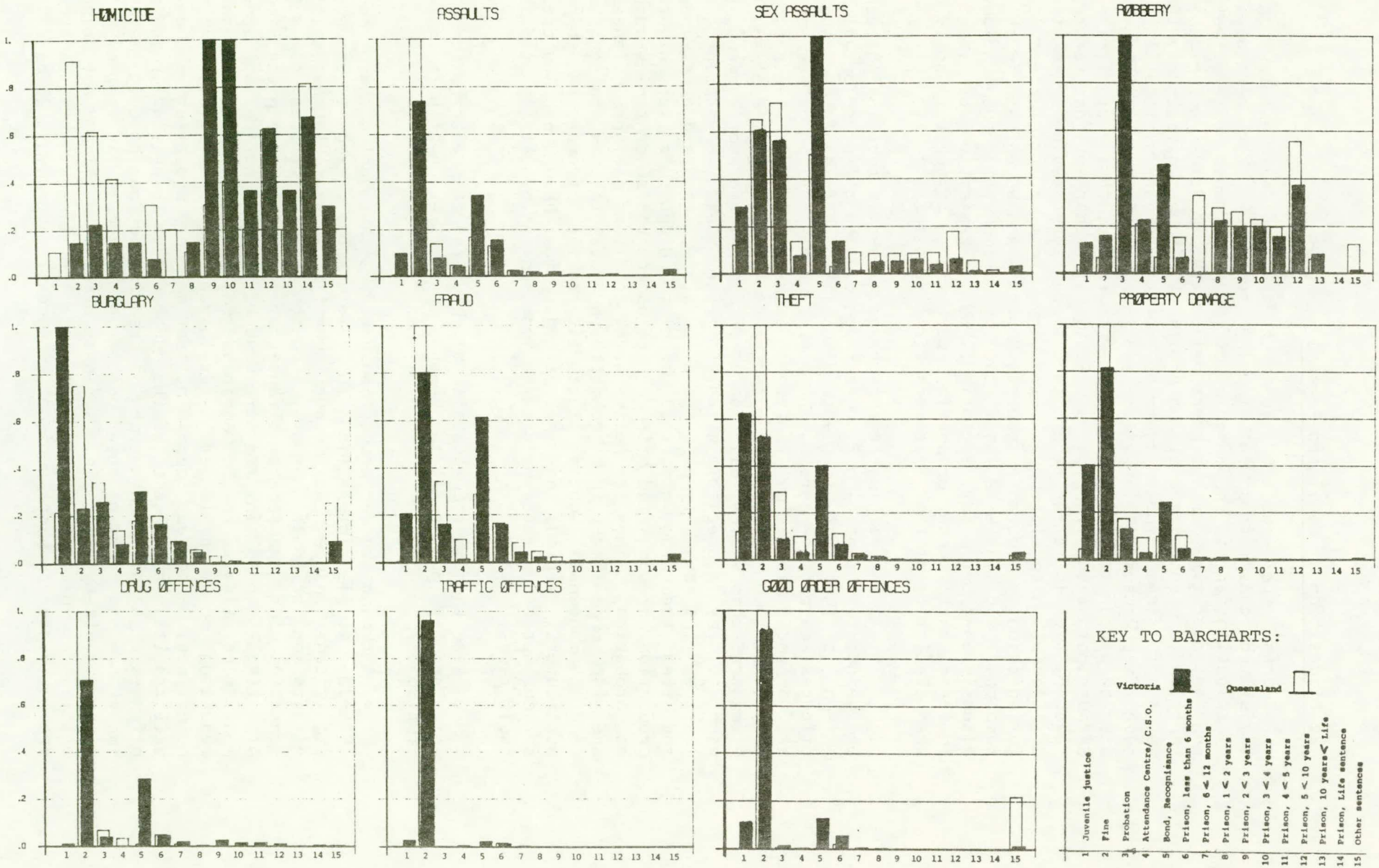


Table 2

PERCENTAGE OF PERSONS CONVICTED OR WARNED BY MOST SERIOUS OFFENCE AND DISPOSITION - VICTORIA

	Juvenile Justice*	Fine	Prob-ation	Attendance/ C.S.O.**	Bond, Recog	Prison (Head Sentences)										
						<6m	6<12m	1<2yr	2<3yr	3<4yr	4<5yr	5<10yr	>10yr	Life	Other	Total
Homicide	0.0	2.8	4.3	2.8	2.8	1.4	0.0	2.8	19.2	19.2	7.0	12.0	7.0	12.9	5.7	100.0
Assault	5.9	49.5	4.8	2.6	22.7	10.3	1.3	.7	.2	.1	.1	0.0	0.0	0.0	1.7	100.0
Sex Assault	9.5	20.4	18.9	2.4	33.8	4.6	.4	1.6	1.7	2.0	1.2	2.0	.3	0.0	.9	100.0
Against Person	11.4	7.9	6.2	0.1	11.5	2.6	3.6	4.5	22.4	8.2	8.2	12.6	0.0	0.0	.9	100.0
Robbery etc	3.8	4.8	30.6	6.9	14.0	1.9	0.0	6.8	6.1	6.1	4.7	11.4	2.4	0.0	.4	100.0
Burglary	44.0	10.2	11.4	3.5	13.4	7.2	3.9	2.0	.2	.1	.1	0.0	0.0	0.0	3.9	100.0
Fraud etc	10.0	39.1	7.8	.6	29.9	7.7	2.0	1.0	.1	.3	.1	0.0	0.0	0.0	1.4	100.0
Receiving	15.9	39.6	8.8	3.2	20.7	7.6	2.0	.7	.2	.1	.1	0.0	0.0	0.0	1.0	100.0
Other Theft	36.8	28.6	4.2	1.4	22.8	3.2	.9	.4	0.0	0.0	0.0	0.0	0.0	0.0	1.7	100.0
Property Damage	25.9	53.4	8.3	1.7	15.9	2.9	.3	.6	.2	.1	.1	0.0	0.0	0.0	.5	100.0
Govt/Justice	10.3	55.7	1.4	1.0	12.0	12.2	1.0	.2	.1	0.0	0.0	0.0	0.0	0.0	6.1	100.0
Prostitution	.1	90.7	1.0	.0	2.7	5.1	.2	.1	0.0	0.0	0.0	0.0	0.0	0.0	.1	100.0
Off. Behaviour	2.8	83.6	.3	.1	9.6	3.0	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.3	100.0
Poss. Weapons	14.2	69.4	.8	.1	11.3	2.8	.3	.4	.2	.1	0.0	0.0	0.0	0.0	.1	100.0
Good Order	17.6	60.3	1.9	.4	14.2	3.4	.5	.4	.2	.1	.1	0.0	0.0	0.0	.9	100.0
Drug Offences	1.9	59.3	3.4	.3	23.9	3.9	1.6	.4	2.1	1.2	1.2	.8	.1	.4	.3	100.0
Traffic Offences	2.4	93.7	0.4	0.2	2.1	1.1	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0

* Including juveniles warned by police for offences committed, juvenile parole and youth training centres.
** C.S.O. = Community Service Orders.

Source: Australian Bureau of Statistics, Number of Appearances by Most Serious Offence by Sex and Result of Hearing, Supreme Court Cases, 1976-1980, Number of Appearances by Most Serious Offence by Sex and Result of Hearing, County Court Cases, 1976-1980, Number of Appearances by Most Serious Offence by Sex and Result of Hearing, Magistrates' Court Cases, 1976-1980, and Number of Appearances by Most Serious Offence by Sex and Result of Hearing, Children's Court Cases, 1976-1980, all published Melbourne, 1983. Research Section, Law Department, Sentencing Statistics - Higher Criminal Courts, Victoria, 1981, Melbourne, 1981.

Victoria, and currently account for around 0.4 per cent of all persons fined. (Persons serving out fines while also in prison on other charges are not included in these figures as this extension of time served is assumed to be taken account of in terms of the effective sentences of persons serving short (under 1 year) sentences.[12]) Fine defaulters currently account for almost 40 per cent of all prison receivals in some Australian jurisdictions and proposals are being considered to divert them from prison to Community Service Orders, in which they repay their 'debt' to society in terms of their own time and effort rather than in a monetary penalty, which many may genuinely not be able to afford to pay. Each of these examples would clearly have the potential to affect prison populations, and it is therefore essential to include mechanisms for simulating their effects in any prisoner forecasting model.

We must also consider whether sex plays a role in the disposition of persons charged, since it clearly is significant in determining the number of persons charged. The courts are supposed to act on the circumstances of the offence and of the offender, but is the sex of the offender a fact which should affect the disposition of the case? The data confirm that sex does affect the number of persons going to prison since, if one applies the percentages from Table 2 to the number of females appearing in court in one year, a result is obtained which is considerably in excess of actual female receivals into prison per year. This may in fact constitute evidence of bias but it more likely represents the facts that women commit less serious offences than men and are less likely to continue offending after apprehension. (See Table 3 which shows the percentages of offenders who were previously known to police in 1979, by age, sex and offence category.)

Table 3

PERCENTAGE OF OFFENDERS PREVIOUSLY KNOWN TO POLICE BY AGE, SEX AND MAJOR CATEGORY OFFENCES - VICTORIA 1979

Offence	Males				Females				TOTAL
	<17	17-20	21-24	25+	<17	17-20	21-24	25+	
Homicide	77	78	76	59	0	0	100	42	62
Serious Assault	53	69	75	62	40	66	25	32	64
Robbery	58	74	93	73	0	25	100	75	74
Rape	57	65	78	74	0	0	0	0	69
Burglary	43	67	86	82	32	50	54	75	56
Theft	30	48	57	43	10	20	26	24	31
Motor Vehicle Theft	58	69	75	77	20	47	100	16	64
Fraud	30	50	64	54	8	42	37	31	64
Total	39	59	70	53	12	27	30	25	43

Source: Victoria Police, Statistical Review of Crime 1980, Melbourne.

These differences between the sexes suggest that if it is important to know the sex breakdown of future prisoner numbers then a model should be used which differentiates at the disposition stage. For the sake of simplicity, however, subsequent sections of this discussion will use a single set of disposition percentages, producing estimates of the number of persons, not by sex, committed to imprisonment. If necessary, however, all jurisdictions should be able to provide the relevant disposition data by sex which would enable separate estimation of male and female prisoner numbers.

The Determination of Time Actually Served in Prison

Prisoner numbers on hand at a given time depend not only on the numbers of prisoners sentenced by the courts, and their sentence lengths, but also on the system which determines their release dates. All Australian prison systems have adopted the concepts of parole and remissions although the details differ from jurisdiction to jurisdiction and, indeed, from time to time. The rules vary according to the length of head sentence and whether the judge or magistrate himself set minimum terms. However, it would be reasonable to say that regulations and practice combine to produce a generally stable and predictable pattern of relationships between head sentences and time actually served in prison, even though this may be intentionally changed, as for example in both New South Wales and Victoria in 1983 and 1984.

Table 4 uses Victorian data and shows the distribution of effective minimum terms currently served by prisoners in Victoria and their relationships to head sentences.13 Reading down the columns, for example, it shows that, of those sentenced to (a maximum) between four and five years, 25 per cent will be either specifically given a minimum term of 1-2 years by the court, or if no minimum sentence was handed down will be granted by the Parole Board a release date equivalent to such a minimum term. Forty per cent of prisoners with 4-5 year head sentences will receive effective minimum terms of 2-3 years; 25 per cent will receive 3-4 years and only 10 per cent will serve the full 4-5 years.

The data required to construct a matrix of this form is normally readily available from prison records so once again it is a relatively simple matter to build a model appropriate to any jurisdiction.

To determine the actual time to be spent occupying a prison bed one has now to subtract time earned for good behaviour. In Victoria for example remissions are earned through time actually served at the rate of one month for every two served, so that a prisoner with an eight year head sentence and a minimum term of six years can normally expect to leave prison on parole after serving four years of his sentence if he receives full remission. The number of prisoners who do not receive full remission is small and the amount of remission lost is also small in relation to the overall time served. The model need not therefore make allowances for lost remissions.

Table 4

DISTRIBUTION OF EFFECTIVE SENTENCE (BEFORE REMISSIONS) GIVEN HEAD SENTENCE - VICTORIA 1982

Effective Sentence	Head Sentence <2 yrs	2<3 yrs	3<4 yrs	4<5 yrs	5<10 yrs	10+ yrs	Life etc.
Under 1 year	98%	25%	-	-	-	-	-
1 and under 2yrs	2%	75%	65%	25%	-	-	-
2 " " 3yrs			25%	40%	30%	-	-
3 " " 3yrs			10%	25%	25%	-	-
4 " " 5yrs				10%	20%	-	-
5 " " 6yrs					12%	-	-
6 " " 7yrs					8%	-	-
7 " " 8yrs					4%	10%	-
8 " " 9yrs					1%	10%	-
9 " " 10yrs						20%	-
10 " " 11yrs						20%	-
11 " " 12yrs						10%	-
12 " " 13yrs						10%	-
13 " " 14yrs						5%	-
14 " " 15yrs						5%	10%
15 " " 16yrs						5%	20%
16 " " 17yrs						5%	20%
17 " " 18yrs							20%
18 " " 19yrs							20%
19 years and over							10%
Total	100%	100%	100%	100%	100%	100%	100%

Source: Parole and Remissions, Second Report of the Sentencing Alternatives Committee of Victoria, Law Department, Melbourne, 1982.

One area in which the model has to be particularly sensitive, because of the large numbers of prisoners involved, is in the shorter sentences. The distribution of sentences handed down by the courts is highly skewed toward sentences of two years and less. Currently around two-thirds of prisoners serving gaol sentences will be free in under two years and more than half of them will be out in less than one year. Because of their large numbers these short-term prisoners have the potential to influence total prisoner numbers both quickly and significantly. In a forecasting model which works on a year-by-year basis it is essential to accurately model the flow of these prisoners. The number of prisoners sentenced during the year to terms of less than one year is a large proportion of total persons sent to prison. The proportion of them who will still be in prison on any

one night is small; specifically it will consist of those persons sentenced less than x days ago to sentences of more than x days, for x being anything from one to 365. Departmental estimates in Victoria have placed this proportion at one in ten and this estimate is incorporated into the model. It would vary if courts either reduced or increased the skewedness of the distribution of shorter sentences. The accuracy of this figure for other jurisdictions can be tested by running the model for two or three years prior to the present day and checking the actual and 'predicted' numbers of prisoners with less than one year remaining to serve. If predicted numbers in this category increase too rapidly then the 1:10 proportion must be reduced to perhaps 1:12. Conversely if predicted numbers fall below actual counts then a 1:8 ratio may be more appropriate.

Security Classifications of Prisoners

The accommodation requirements of a prison are affected by the structure of the prison population. Prisoners of a violent and dangerous nature or those who are liable to escape cannot be kept in a low-security section of the prison, and conversely, trusted prisoners should not be placed in overly oppressive regimes. If the system of security classification is inflexible this can lead to empty beds in some sections while others are over-full. However, the borderlines between security classifications, no matter what system of classification is in operation, are relatively flexible and it could be argued that this makes it pointless to try to forecast prisoner numbers disaggregated by security groups. It is at least a good start to show forecast numbers disaggregated by time remaining to be served and perhaps by offence type, and the model has been constructed in such a way that this is possible. The proportion of the prison population in maximum, medium or minimum security classifications can be inferred from the proportions of long-term prisoners in the prison population and the proportions of non-violent offenders amongst receivals, or some such formula. Even so, it is of interest to see how the model can describe the application of current security classification practices, and how they might need to change in reaction to projected changes in the prison population.

Incorporating an algorithm for the allocation of prisoners to initial security classifications and then reallocating them, at intervals through their prison term, to successively lower security levels, as is the Victorian practice, involves effectively dividing the forecasting model into separate security streams. Victorian correctional practice is that prisoners serving more than one year are initially placed under maximum security on arrival, while those serving under one year go to medium security; all maximum security prisoners would then normally expect to be transferred to medium security after serving one-third of their term, and would go to minimum security after serving two-thirds. It is understood however that around one-third of prisoners fail to obtain the transfer at each stage. This has been interpreted to mean that:

- all prisoners serving more than one year remain in maximum security until they have served 1/3 time (including remissions);

- after 1/3 time, two-thirds of prisoners are allocated to medium and one-third remain in maximum security;

- after 2/3 time, 4/9 of prisoners are allocated to minimum, 4/9 to medium and 1/9 to maximum security.

Prisoners received to serve sentences of under one year are also divided 4:4:1 although, as before, only a fraction of them are retained at the end-of-year count.

Once again, similar sets of rules can be specified to represent classification systems operating in other jurisdictions. Incorporation into the model is normally simple. It is worth remarking, though, that the extra computational difficulties involved in projecting prisoner numbers by security classification may lead to a reduction in confidence in its results and may make it impossible to run the model on some small computers.

What to do About Remandees

The total prison population is usually augmented by remandees; that is, unconvicted persons awaiting trial or convicted persons awaiting sentence. To the extent that these persons eventually do not receive prison sentences, or if sent to prison do not have their time served on remand taken into account, their occupancy of prison accommodation is not covered by the model described so far.

It is perfectly arguable that, in fact, these persons should not be counted as prisoners since they are expected to be housed in special remand sections of the prison structures and may well have privileges not available to sentenced prisoners.[14] If they are 'innocent until proven guilty' then they should not be treated like prisoners until at least proof of guilt has been legally established. In Victoria, steps were being taken to provide separate accommodation for remandees and it was therefore possible to ignore them in the projection of prisoner numbers. However, in some practical situations it is necessary to consider remandee accommodation, and although the methodology described to this point should not be used, similar techniques are available.

One could assume, for example, that the principal determinants of remand in custody decisions are the nature of the charge (e.g. seriousness, violence involved, etc.) and the prior record of the accused person, which might be expected, in turn, to be related to age and sex as well as offence-type. Table 3 shows some logical and consistent relationships covering age, sex, offence and previous contact with police: this in itself is not an adequate basis for projection but when linked with current remandee characteristics from the annual prison censuses would probably result in a credible sub-model for determining remandee

arrivals. Data on time served on remand, by offence-type, would then allow the estimation of remandees-on-hand figures. This type of formulation would then allow the input of modified assumptions, in particular, describing hypothetical toughening or easing of the judicial use of remand, or the effects of improved court efficiency upon remand durations.

The Treatment of Non-Custodial Corrections

Similar restrictions are placed on magistrates and judges with respect to non-custodial sentences to those regarding prison sentences; that is, there are limits to fines, maximum terms of probation, etc. and precedents have considerable power to define the appropriate range of penalty for a given offence. The data from Table 2 and Figure 6 can thereby be used to calculate likely numbers of offenders by type of non-custodial sentence. Average figures for fines could be obtained and applied to the forecast numbers of persons fined in order to forecast revenue from such sources, however, we are more interested in determining likely client numbers in programmes such as probation, attendance centres and community service orders.

The disposition matrix when applied to population forecasts gives us the number of receivals into such programmes each year, but the numbers on hand at any one time are dependent upon the sentence lengths handed down; for example, one probationer sentenced to two years occupies almost as much of a probation officer's time as three probationers each sentenced to eight months, although supervision is always more intensive at the start of any probation period. A method of extending the disposition matrix in these areas must be found, in the same way as prison terms are distributed according to recent statistics. Court statistics or corrections receival statistics should be available to construct a matrix similar to Table 5 and a simple methodology can be applied to then obtain numbers of clients by sentence length. From this can be calculated the likely trends in 'on-hand' figures from which the demand for departmental manpower and resources can be derived. Projection of probationer numbers should in fact be rather easier than the projection of prisoner numbers since terms of probation are generally set in whole numbers of years and are not subject to the uncertainties and quirks of a parole system. On the other hand, attendance centre and community service orders have a rather short history from which to project and entail durations usually counted in months rather than years which means that the numbers on hand at a given date will be a relatively low proportion of those received during the year. Community service orders in Victoria cannot be realistically projected at all because of their very recent commencement and uncertainty over the extent to which community service orders will replace the various other forms of sanction.

Table 5 gives the assumed sentence length distributions for both Probation and Attendance Centre Orders, by offence type, as derived from departmental records.[15]

Table 5

PERCENTAGE DISTRIBUTION OF SENTENCE LENGTHS BY OFFENCE TYPE:
PROBATION AND ATTENDANCE CENTRE ORDERS - VICTORIA

	Probation*						Attendance Centre Order**					
	<1 yr	1<2 yrs	2<3 yrs	3<4 yrs	4<5 yrs	Total	<3 mths	3<6 mths	6<9 mths	9<12 mths	1<2 yrs	Total
Homicide	12.5	12.5	75.0	-	-	100	33.2	33.2	13.4	11.9	8.3	100
Assault	27.4	52.5	16.3	2.0	1.8	100	33.2	33.2	13.4	11.9	8.3	100
Sex Assault	22.4	50.6	23.7	1.3	1.9	100	33.2	33.2	13.4	11.9	8.3	100
Against Person	18.1	45.5	36.4	-	-	100	33.2	33.2	13.4	11.9	8.3	100
Robbery etc	5.3	18.7	62.7	9.3	4.0	100	-	34.8	-	17.4	47.8	100
Burglary	26.4	57.2	14.4	0.5	1.4	100	24.5	36.7	20.4	12.2	6.1	100
Fraud etc	26.1	53.1	17.9	1.7	1.2	100	24.5	36.7	20.4	12.2	6.1	100
Receiving	39.2	48.8	10.8	1.2	-	100	24.5	36.7	20.4	12.2	6.1	100
Other Theft	37.5	52.1	8.8	1.0	0.6	100	24.5	36.7	20.4	12.2	6.1	100
Property Damage	31.0	51.0	10.0	5.0	3.0	100	-	42.8	28.6	-	28.6	100
Govt/Justice	40.8	47.9	11.3	-	-	100	27.4	56.7	9.1	6.8	-	100
Prostitution	40.8	47.9	11.3	-	-	100	27.4	56.7	9.1	6.8	-	100
Off. Behaviour	40.8	47.9	11.3	-	-	100	27.4	56.7	9.1	6.8	-	100
Poss. Weapons	40.8	47.9	11.3	-	-	100	27.4	56.7	9.1	6.8	-	100
Good Order	40.8	47.9	11.3	-	-	100	27.4	56.7	9.1	6.8	-	100
Drug Offences	30.2	48.0	20.9	0.9	-	100	-	-	-	75.3	24.7	100
Traffic Offences	38.7	42.3	16.2	2.7	-	100	31.0	47.5	9.0	10.8	1.7	100

* Based on 1980-83 data.
** Based on 1982 data.

Source: Department of Community Welfare Services, Victorian Attendance Centre Census - 1982 Data Tables (draft), Attendance Centre Trends (working document), Probation Tables - Offence x Length of Sentence 1971-72 to 1982-83 (working document), Probation Orders Received from Adult Courts 1980-83 (working document).

PART II

THE OPERATIONAL LOGIC OF THE ORACLE MODEL

The Model's Ancestors

The choice of variables and structure of the relationships between them is vital in the determination of model structure. For example, in 1977 Flanaghan[16] wrote of linear multiple regression models for projecting prisoner numbers using population aged 20-29 years and court caseloads as the independent variables. Such models cannot be used to test hypotheses involving detailed interactions between external demographic, judicial and penal variables simply because they are subsumed into the main variables, that is they are assumed to be in fixed relationship to the main regression variables. For the same reason one cannot use simple growth rate extrapolation for long term projection although it has its uses in the very short term (say one to five years).[17] Less elegant numerical methods allow rather more sophisticated assumptions to be built into the model.

Blumstein et al.[18] defined the logical process underlying prisoner number projection as a five-step model using matrices of probabilities:

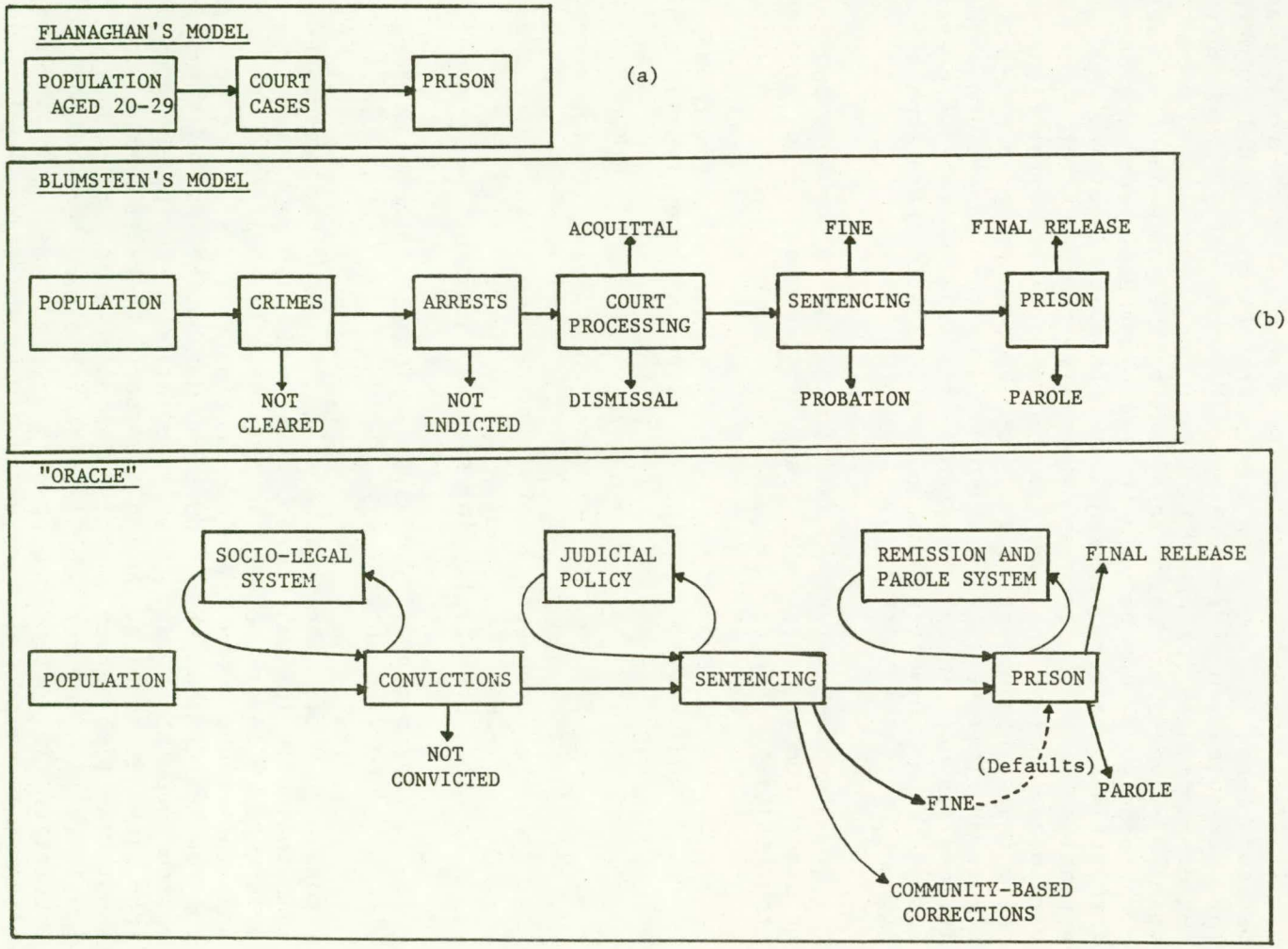
- the probability of an individual of a given age, race and sex committing a given offence type in a given year,
- the probability of such an individual being arrested,
- the probability of such an individual being charged,
- the probability of such an individual being convicted,
- the probability of such an individual being sentenced to imprisonment.

Figure 7 shows their schema. They further discussed the computational logic, whereby they model two separate streams of prisoners - those who were in prison at the beginning of the year and those who were received during the year. The model must somehow determine the reduction during the year of the initial prison population and the accumulation of new prison population from inmates received during the year. He makes some assumptions about the time served in prison using an exponential derived from Stollmack's[19] earlier work, so that the reduction of the initial population is determined by the average time served for a given offence by a person of given age, race and sex. He also assumes that prisoners' arrivals are (poisson) randomly distributed throughout the year.

The model described below is similar in structure and mechanics but contains some major simplifications. Firstly, race is not considered as a demographic variable because in most parts of Australia the simple black/white dichotomy does not have the

Figure 7

CONCEPTUAL PROCESSES GENERATING PRISON POPULATIONS UNDER VARIOUS ASSUMPTIONS



relevance it does in the United States. This is not to forget that Aboriginal imprisonment rates in Australia are something over ten times the non-Aboriginal rate but the smallness of the numbers in most jurisdictions precludes separate analysis. Second, the probability of committing an offence, the probability of arrest, the probability of being charged and the probability of conviction are all subsumed into one matrix which is obtained from age/sex/offence specific conviction rates. Third, time served is calculated from recent actual statistics and norms rather than via an abstract mathematical assumption. These differences make this model rather less demanding of police and court data, which in Australia might be unavailable or incompatible with the corrections data, but do not basically change the form of the model. On the other hand this model goes further into the non-prison alternatives using similar techniques to the prisoner sub-model.

The Model's Mechanisms

Briefly, the model takes receivals from the court system during a year, adds them to the various corrections populations on hand at the beginning of the year and works out which of those persons will still be under correctional treatment at the end of the year. Figure 8 shows a flow-chart of the model.

The first stage, taking the projected population by age and sex and multiplying by the conviction rates, gives an estimate of the numbers of persons being sentenced by the courts by offence type, age and sex. These can be printed and checked against current figures and their validity assessed. Also, at this stage, detailed assumptions of future changes in rates of offending or conviction can be incorporated into the model by changing individual elements of the table of conviction rates.

Stage two takes the number of persons convicted and divides them according to the type of sentence, and, where appropriate, the duration of the sentence. This too is performed separately for each offence type so that detailed assumptions of changes in sentencing patterns can be incorporated by changing individual elements of the disposition rates table. The numbers of persons by disposition can also be printed for validity checking purposes.

Stage three calculates the minimum terms from the head sentences of prisoners received during the year, according to the percentages set out in Table 4. The elements of this table are manipulable to simulate potential changes in sentencing practice relating specifically to minimum terms. At this stage also the fine-defaulters are transferred into the prisoner numbers. The receivals are now added to the persons on hand at 30 June of the previous year.

The model next simulates the process of serving time within the system. Those on hand at the beginning of the year with less than one year to serve will of course have been released during the year, as will many of the receivals with sentences under one

year. All others will have served one full year which will entitle them to a further six months' remission at the currently adopted rate. This one-for-two rate of remission is another part of the model's operation which can be modified to simulate possible administrative action.

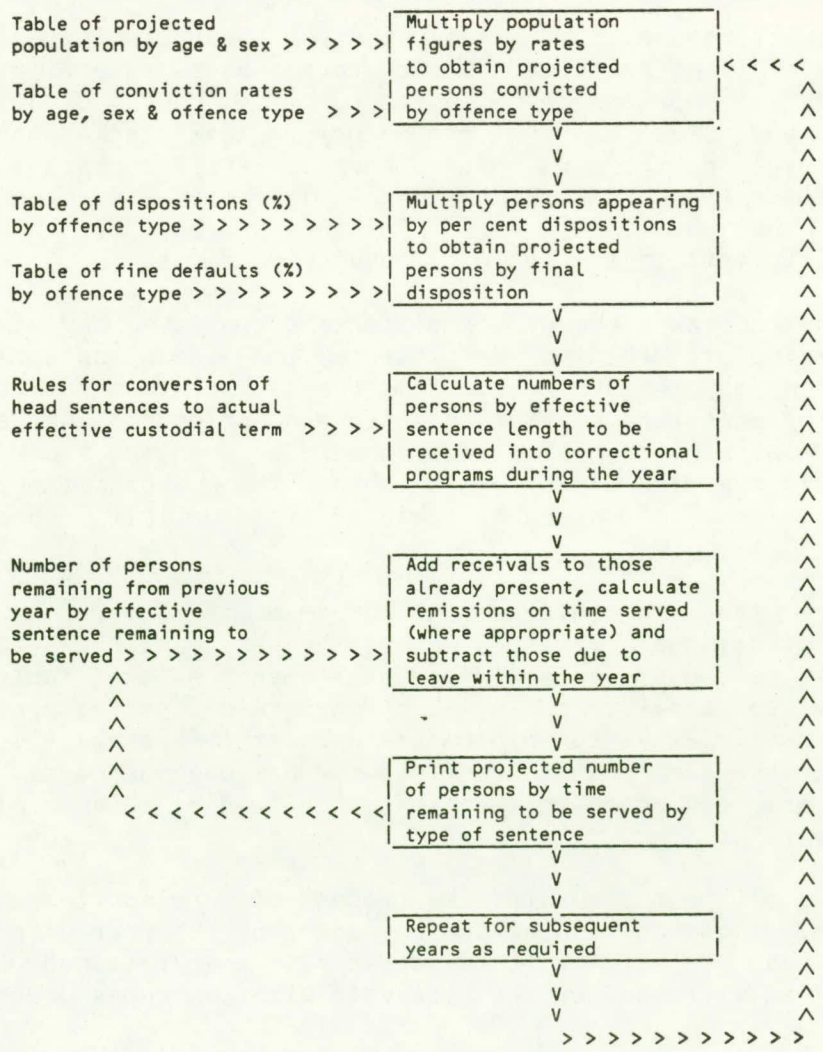
Finally, the number of persons received during the year, by sentence type and sentence remaining to be served, and the number on hand at census date (30 June) are printed, and the cycle of the model begins again with updated population figures.

Amendments to the basic matrices and mechanisms in the model may be made at this point to be incorporated in the next year's calculations. At the end of the 18 year cycle which brings the model up to the year 2000, summary tables are produced, showing the trends in overall numbers received and on hand, by effective sentence remaining to be served and by type of sentence (that is, prison, probation, attendance centre).

The Fortran listing and the definitions of the variables used therein can be found in Appendices 1 and 2.

Figure 8

FLOW CHART FOR PROJECTION OF PRISONER NUMBERS 1982-2000



PART III

USE AND RESULTS OF THE MODEL

Obtaining a 'Base Run'

As with any area of forecasting, one can build into a corrections forecasting model the most ingenious representations of reality only to find that, when the model is called upon to produce results, it produces nonsense. The problems usually lie in the selection and balance of the variables and mechanisms used in the model, and the only way to test these aspects of the model is to feed in base data relating to a time gone by and run the model until it reaches the present day. The model's 'projections' should then be tested in every conceivable way against known actual statistics. For example, not only should total 'on-hand' prisoner numbers produced by the model be acceptably close to actual figures, but also the distributions, by offence type and sentence remaining to be served, of prisoners received during the year and prisoners on hand at the end of each year should be consistent with actual figures. If they do not tally, each intermediate ouput of the model (for example, numbers of persons proceeded against and numbers of sentenced persons by disposition) should be checked against known figures. Input data, if found suspect, must be modified; program steps, if leading to erroneous trends, must be changed. The model must be modified and re-run until two conditions are present:

(1) the input data and mechanisms appear comprehensive and realistic to informed practitioners in the correctional administrative system; and

(2) the results are acceptably close to known statistics in all respects.

The detail with which this process can be conducted depends considerably on the availability of past data, however, basic prisoner totals for all jurisdictions are available for several years back on a monthly basis and most jurisdictions conduct some sort of annual census of prisoners.[20] The National Prison Censuses since 1982[21] also provide a valuable common base with their crosstabulations by offence, aggregate sentence, time already served and actual expected sentence. Similar data can usually be obtained for non-custodial corrections from court statistics and from correctional management data. Also, the National Census of Community Corrections (the first of which took place on 30 June 1985) will provide useful background information in this area.

Testing of the Victorian data took the form of projecting from the June 1982 census 'prisoners on hand' data, along with non-custodial figures relating to the same period, and checking all stages of the model against known 1983 data. (The Queensland model was even better tested, with 'projections' of 1983, 84 and 85 being verified against known figures). Key items included in the checks were actual numbers received during the year by age and sex, by offence, and by sentence type (for example, prison, probation, attendance centre) and length. Court statistics were

statistics were used wherever prison data were inadequate or unavailable. Some elements of the conviction rates and disposition rates matrices were modified to reflect recent trends in receivals of particular offence types and ages of offenders. Prison census data from June 1983 and the results of non-custodial censuses were then used to confirm the accuracy of the mechanisms dealing with persons remaining in the corrections system throughout the year and persons being released. When satisfactory results were obtained the model was then allowed to run for the full projection period, that is up to the year 2000. At this stage the population projections used were the 'most likely' projections as described in Preliminary Population Projections,[22] and all model options were set at 'status quo'. In other words the base run can be described as a projection of likely prisoner numbers under 'no change' conditions. Prison administrators normally have some idea of their expectations under such conditions and it is valuable again at this stage to see if the model's results conform to those expectations. If they do not conform, it does not necessarily prove the projections false, but it is necessary to pinpoint the basic area of disagreement and adjudicate - the model must be sufficiently robust to convince informed skeptics of its accuracy at this stage - and modify the model if necessary.

In the Victorian case, the model forecast an annual prisoner intake of 6252 rising to 6817 in the year 2000. These figures were commensurate with current departmental estimates and expectations. When sentence lengths, paroles and remissions were taken into account, the June 1982 figure of 1753 persons on hand is projected to rise rapidly through 2000 persons within two years and then slow to reach 2300 by 1990 and a figure of 2520 in the year 2000. A significant feature of this projected rise of around 800 persons in 18 years is that half of these additional persons would be prisoners with more than two years remaining to serve. This is partly the result of greater numbers of receivals but partly also the result of the slow accretion of long-term prisoners. These would be generally older, often the more violent offenders, and inevitably more institutionalised than the majority of prisoners with under two years to serve. This, on reflection, was a trend quite in conformity with departmental expectations, and indeed fears, and so these figures were accepted as a base scenario against which other runs, incorporating different assumptions, could be compared.

Other parts of the model, such as the probation and attendance centre forecasts also tallied with current numbers and expectations. A fairly significant jump from 3000 to 3850 on probation and a near doubling of attendance centre clients on hand in June 1983 accorded with actual figures. (See Appendix 4 for the printed results of the Base Run.)

Initial Variations on the Base Run

Having arrived at an acceptable base run, a number of scenarios which might be envisaged in the future should be

obtained from departmental staff, and simulated in the model using those variable features in the model as described above. Each of the subsequent set of runs should generally comprise one set of variations from the base run. Clearly many sets of variations, some at odds with others, can be operating simultaneously in the real future world, but, at least initially, their combined results can be inferred from comparisons of the results of the individual runs.

These initial variants of the base run principally serve the twin purposes of further testing the logic of the model (for example, showing that events likely to add to the prison population actually do so in the model, and vice versa) and showing the sensitivity of the model to the assumptions being modelled. Table 6 shows the nature of the assumption tested in each Victorian run, and Figure 9 shows the projected trends in prisoner numbers at 30 June each year for the base run and each of the sensitivity runs.

Generally it would appear from the detailed printouts (see Appendix 4) that although the growth in numbers of long-term prisoners accounts for much of the increases common to all curves in Figure 9, it is the large number of short-sentence prisoners which can best be manipulated to influence total prisoner numbers.

The inclusion of the population trends in Figure 9 also highlights the fact that all these prisoner number projections resulting from the sensitivity runs forecast increasing per capita imprisonment rates until the mid 1990s at least, whichever population projection is used. (The scales on the graph are drawn so that wherever the prisoner number curve is above the selected population curve the per capita imprisonment rate is higher than that of the base year, that is, 1982.) Hence we have immediate support for the adoption of a range of policies if prisoner numbers or the overall per capita imprisonment rates are to be kept down since none of the policies tested appear capable of doing so alone.

The results show that the most effective way to reduce prisoner numbers is seen in Run 4 which incorporates a 50 per cent transfer of persons sentenced to under six months' imprisonment to some form of non-custodial option. Although these prisoners do not occupy cells for very long their sheer numbers are significant, and since the time spent by staff in preparing files, and attending to their reception, installation and discharge is almost the same for them as for much longer term prisoners, they are a considerable burden on the prison system. Almost certainly, however, it would require complex legislative changes to achieve such a shift in sentencing emphasis, and partial success would logically only achieve a part of the reduction in prisoner numbers shown in the graph.

Almost as effective in reducing prisoner numbers is a

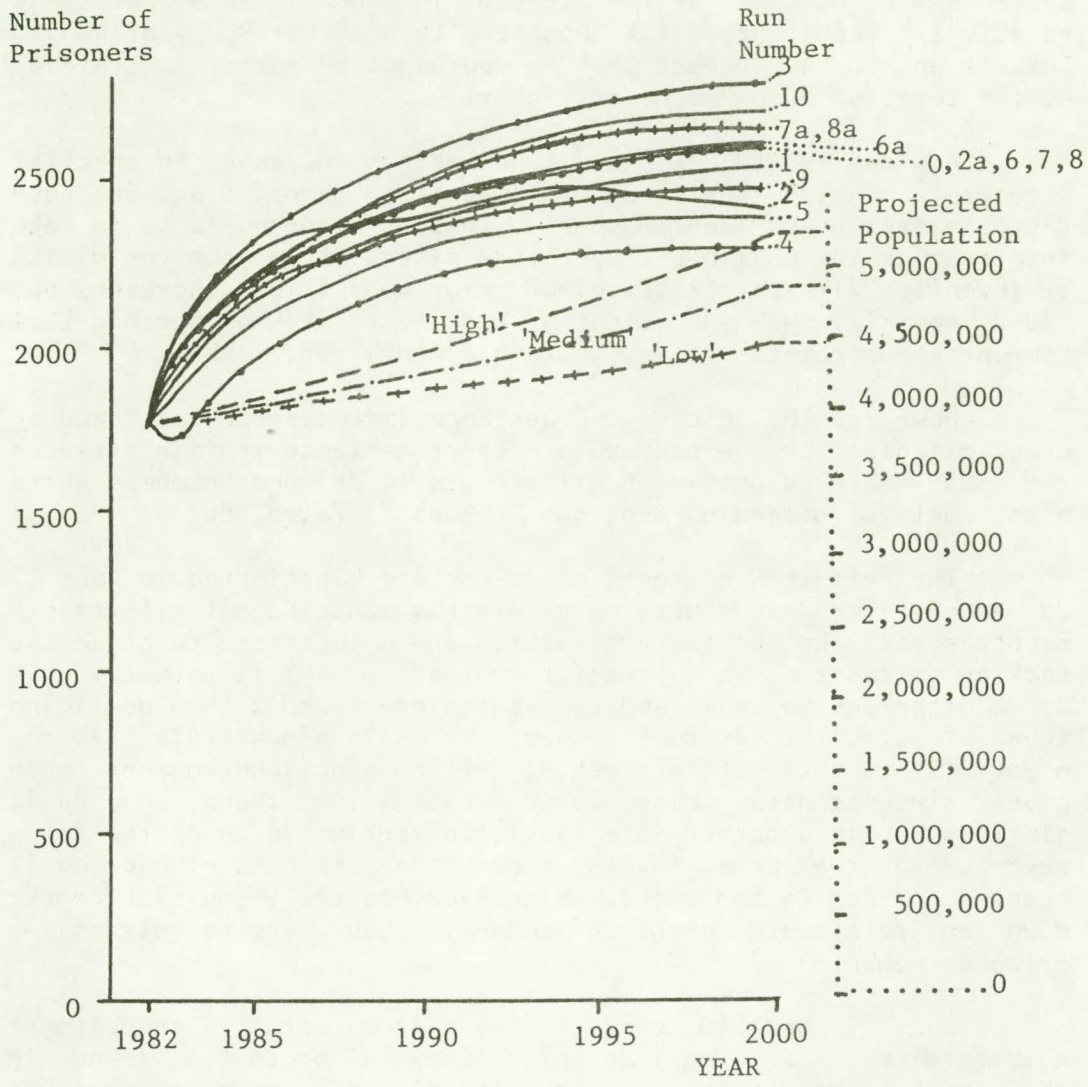
Table 6

SENSITIVITY ANALYSES ASSUMPTIONS TESTED

Run Number	Nature of Assumptions Tested
0	Base Run - medium population trend, with status quo criminal justice system.
1	As Base Run, but 50% of those presently sent to prison for fine-default are transferred to non-custodial.
2	As Base Run, but increased court activity (to reduce current backlog) results in 8.5% more cases heard in 1983, 7.5% in 1984...(reducing to) 0.5% more in 1991, and then reducing further so that by year 2000 there are 8.5% fewer cases than 'expected'. Caseloads are modified 'across the board', that is, all offence types, dispositions, etc.
2a	As Run 2, but the number of cases resumes 'base' trend after 1991.
3	As Base Run, but longer sentences for those sentenced to under 1 year (or less generous remissions) result in 25% increase in those remaining at end of year.
4	As Base Run, but 50% of those presently sentenced to under 6 months imprisonment given non-custodial sentences (distributed as per similar offences where non-custodial sentences are served).
5	As Base Run, but 50% of those serving 3 years or more are released during their penultimate year in pre-release program.
6	As Base Run, but juvenile unemployment causes 8.5% increase in juvenile (age 16-19) offending in Robbery, Burglary, Theft, Property Damage, Prostitution and Good Order in 1983, declining to 0.5% increase in 1991, and resuming 'base' trend thereafter.
6a	As Run 6, but 8.5% constant increase through entire period 1983-2000.
7	As Base Run, but 8.5% (declining to 1991 in similar manner to Run 6) increase in white collar crimes of Fraud and Drug Offences by persons aged over 19.
7a	As Run 7, but 8.5% constant increase.
8	As Base Run, but 8.5% (declining to 1991 in similar manner to Run 6) increase in Traffic Offences.
8a	As Run 8, but 8.5% constant increase.
9	As Base Run, but using low rate of population growth.
10	As Base Run, but using high rate of population growth.

Figure 9

PROJECTED PRISONERS ON HAND IN VICTORIA AT 30 JUNE 1982-2000
FROM SENSITIVITY ANALYSIS RUNS AND TOTAL POPULATION
TRENDS FOR THE SAME PERIOD



Note: 1. See Table 6 for details of Run numbers and characteristics.

2. The dashed lines in the graph are the High, Medium and Low population projection curves, shown in order to demonstrate changes in imprisonment rates relative to the base year 1982. (Whenever the prisoner number curve is higher (or lower) than the population curve the imprisonment rate is higher (or lower) than that of 1982.)

reduction in time actually served in prison by longer term prisoners (Run 5). This could in fact be achieved by an overall reduction in head sentences, by increasing the maximum remission ratio from one-third of minimum term to two-fifths or even a half, or by a form of pre-release as now operates in some states. Again, the reduction in numbers achievable by these methods would depend upon the percentage reduction in average times served.

A third policy which leads to reduced prisoner numbers is a 50 per cent transfer of fine defaulters to non-custodial sentences. At the degree tested in Run 1 this policy is relatively less successful however than either Run 4 or Run 5. This is not to say however that it would not be easier to achieve, at the level of 50 per cent or higher.

As one would expect, hypothesised increases in specific offences largely committed by juveniles (Runs 6 and 6a) have little effect on prisoner numbers. This, of course, fails to take into account the possible longer term effect of serious recidivism by juveniles with relatively minor prior convictions, however, one could specify such a scenario and test it in the model if appropriate parameter values could be identified.

However, low volume/long sentence offences such as fraud or drug offences or the high volume/short sentence traffic offences can both make significant differences to prisoner numbers while high levels of offending continue. (Runs 7, 7a, 8, 8a)

The effects of court decisions are highlighted in Runs 2, 2a and 3. Run 2 is something of a straw man since it effectively hypothesises the unlikely situation where an effort to clear the backlog of cases is so successful that after 1991 it actually acts as a deterrent to crime and the courts are faced with a declining level of activity. It does, however serve to demonstrate that the model is capable of forecasting declining prisoner numbers when given circumstances which would foster that trend. Run 2a is similar, but is a rather more realistic version in which the trend reverts to the base levels soon after the court backlog is removed. Run 2a and Run 3, which hypothesises a judicial crack-down on relatively minor offenders, show very rapidly rising prisoner numbers.

Runs 9 and 10 show the level of uncertainty in prisoner numbers directly arising from uncertainty in forecasting trends in the general population. They effectively form upper and lower bounds to the Base Run which uses an intermediate population trend. Similar bounds could be determined around each of the other trend curves to establish limits to planning error potentially due to the least controllable factor in the simulation, that is, population.

The model also produces projected non-custodial numbers for each of these scenarios, which should be scrutinised in as much detail as the prisoner number results. The trends in non-custodial numbers clearly depend upon the assumptions made in the sensitivity runs and these results should also be compatible with

reasonable expectations given the nature of the assumptions made. Suffice it to say here that, in the Victorian case,this was indeed the case but it is judged unnecessary to relate them here. It is of much greater interest to move on to the final phase of the model's use and present the more detailed non-custodial results there.

Selected Scenarios

Up to this stage, we have regarded our base run as a benchmark against which we have tested certain hypothesised policy changes and exogenous changes. Now we turn to a more considered approach to likely future trends.

Certain combinations of circumstances are of particular interest to forecasters. For example, one can talk of the 'most likely' set of circumstances, the best (or worst) likely set, or the best (or worst) possible set of circumstances. Likewise one can talk of a 'do nothing' set of circumstances or a 'do everything' set. Each of these concepts can be described as a scenario. This section describes the results of three scenarios and compares them with the base-run results which may be regarded as a 'do nothing' scenario.

Clearly there is an intuitive ranking of the scenarios mentioned above. From most adverse to most favourable they are: 'worst possible', 'worst likely', 'most likely', 'best likely' and 'best possible', with 'do nothing' and 'do everything' at indeterminate points along that scale. The concepts of worst possible and best possible incorporate effectively unforeseeable events such as unprecedented reductions or increases in rates of offending. No forecaster should be expected to manage that magnitude of change, and it is therefore reasonable to restrict ourselves to the more likely sets of circumstances.

On best available advice, three sets of circumstances should be constructed:

(a) a best likely, or optimistic scenario. The Victorian example below foresees low rates of population growth, a 50 per cent pre-release program, and a 50 per cent transfer to non-custodial sentences of those previously sentenced to under six months, and those previously jailed for fine defaults (that is, Sensitivity Runs 1, 4, 5 and 9).

(b) a most likely run, based on current expectations. In Victoria this was defined as longer sentences for those serving less than one year, but a 50 per cent pre-release program, and a 50 per cent transfer to non-custodial sentences of those previously sentenced to under six months and those previously gaoled for fine defaults (that is, Sensitivity Runs 1, 3, 4 and 5).

(c) a worst likely, or pessimistic scenario. The Victorian example foresees high rates of population growth, continuing high rates of crime in specific juvenile areas, white collar offences and traffic offences, and longer sentences for those sentenced to under one year, with only the one alleviating policy of reducing by 50 per cent the number of imprisoned fine defaulters (that is, Sensitivity Runs 1, 3, 6a, 7a, 8a and 10).

Figure 10 and Table 7 show the results of these three scenarios along with the original base run which can be regarded as a 'no change' scenario. In these scenarios, the pre-release program commences in 1983-84, other forms of diversionary schemes commence in 1984-85, while other changes (for example, to rates of conviction, population levels or sentence lengths) take immediate effect.

Perhaps the most striking feature of Figure 10 is that, under relatively favourable conditions, the per capita imprisonment rate can be retained at Victoria's customarily low level. The prisoner number curves for both the 'most likely' and 'optimistic' runs stay close to their respective population curves (that is, the Medium and Low projection).

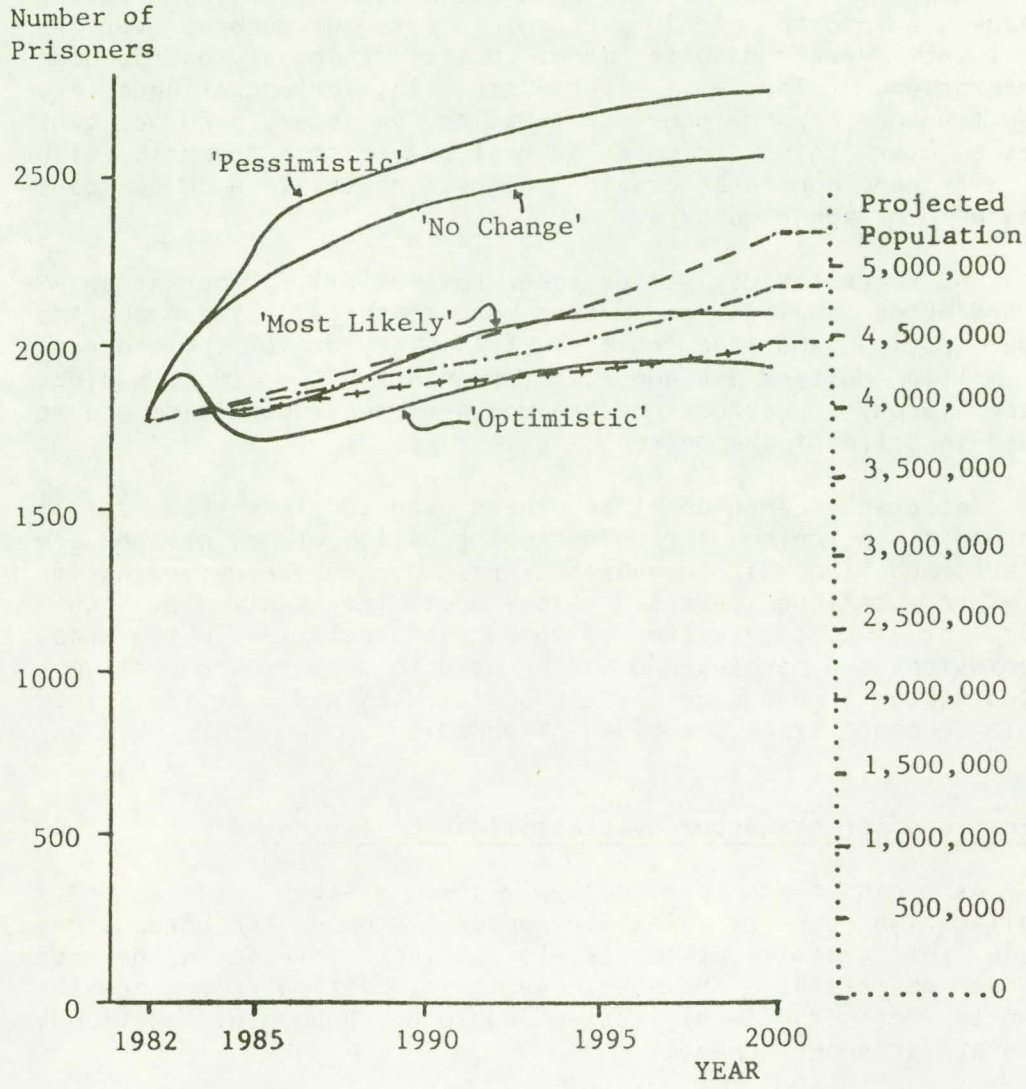
Table 7

PROJECTED PRISONERS ON HAND IN VICTORIA AT 30 JUNE 1982-2000: SELECTED SCENARIOS

Year	Number of Prisoners by Scenario Type			
	No Change	Pessimistic	Most Likely	Optimistic
1982	1753	1753	1753	1753
1983	1963	1917	1835	1729
1984	2061	2017	1677	1575
1985	2152	2287	1755	1652
1986	2222	2376	1815	1703
1987	2274	2436	1859	1743
1988	2317	2486	1900	1774
1989	2356	2531	1937	1802
1990	2397	2577	1976	1833
1991	2435	2621	2011	1863
1992	2468	2662	2040	1889
1993	2492	2699	2061	1907
1994	2509	2730	2075	1919
1995	2523	2757	2086	1926
1996	2538	2781	2101	1933
1997	2548	2808	2107	1937
1998	2553	2828	2112	1938
1999	2559	2841	2115	1936
2000	2566	2851	2121	1937

Figure 10

PROJECTED PRISONERS ON HAND IN VICTORIA AT 30 JUNE 1982-2000
FROM SELECTED SCENARIO RUNS AND TOTAL POPULATION TRENDS
FOR THE SAME PERIOD



Note: The dashed lines in the graph are the High, Medium and Low population projection curves, shown in order to demonstrate changes in imprisonment rates relative to the base year 1982. (Whenever the prisoner number curve is higher (or lower) than the population curve the imprisonment rate is higher (or lower) than that of 1982.)

The policy of imposing non-custodial sentences on fine defaulters shows an immediate and persistent fall in prisoner numbers of around 150 prisoners. The hypothesised toughening of short-term sentences (Sensitivity Run 3) has a marked upwards push on prisoner numbers, however it can be more than compensated by the adoption of the 50 per cent pre-release program and the greater use of non-custodial options (Sensitivity Runs 4 and 5). If, additionally, population growth is at the lower end of the officially accepted projections, then even lower prisoner numbers are attainable. Even this most optimistic scenario, however, envisages a growth of 10 per cent in prisoner numbers over the next twenty years despite major policy changes towards non-incarceration. The most likely scenario, incorporating a less marked tendency towards non-incarceration, envisages a 20 per cent increase over this period. The most pessimistic scenario, with only a token non-incarceration policy, results in a 50 per cent increase in prisoner numbers.

On a present day per prisoner cost of $21,750 per annum,[23] the projected savings on prison expenditures between the 'no change' policy and the 'most likely' policy are of the order of nine million dollars per annum, although not all would be savings to the taxpayer because of the costs of the supervision orders imposed in place of the prison terms.

Selected scenarios like these should form the basis of departmental planning including the provision of new prisons, or new accommodation within existing prisons, and the determination of future staffing levels. They would inevitably also highly colour the future selection of corrections policies in the areas of remissions and parole, and can be used to support arguments put to legislators regarding the appropriateness and practicality of certain sentence types for given offences.

Implications for the Security Classification System

As discussed previously, any system of security classification can be flexible enough around the borderlines between the classification levels so that forecasting becomes somewhat pointless. However, it is interesting to see how the presently defined classifications would be changed by the trends in overall prisoner numbers.

The Victorian base run was re-worked using the security classifications algorithm and produced the results shown in Figures 11 and 12 and Table 8. The increased complexity of the model and its compounding of rounding errors produce prisoner numbers slightly different from the original base run, eventually amounting to a difference of 37 (or 1.4 per cent) in the final projected year of the run. However, it confirmed the increasing share of higher security prisoners which one would probably infer from the increasing shares of long-term prisoners.

As Figure 11 shows, the recent growth in numbers of long-term prisoners continues to swell the numbers and proportion of

maximum security prisoners, with the pattern repeated later in medium security as they filter through the system. In both absolute terms and in percentages, however, the number of minimum security prisoners reduces as sentencing practices continue to divert minor offenders to non-custodial sentences. The initial split of 40 per cent in maximum, 40 per cent in medium and 20 per cent in minimum security is fairly quickly changed to one of around 45:45:10 if current allocation practices are retained. This suggests perhaps that better identification of low risk prisoners may be required under a regime in which long-term prisoners are more predominant, if per prisoner costs are to be kept to levels commensurate with present day costs, since high security prisoners necessarily require more resources and supervision than those at lower levels.

Other scenarios could be tested through this version of the model but have not been documented here, since they produce fairly predictable deviations from the Base Run given our knowledge of overall prisoner numbers trends in each scenario.

Figure 11

PROJECTED PRISONERS ON HAND IN VICTORIA AT 30 JUNE 1982-2000
BY SECURITY CLASSIFICATION - BASE RUN

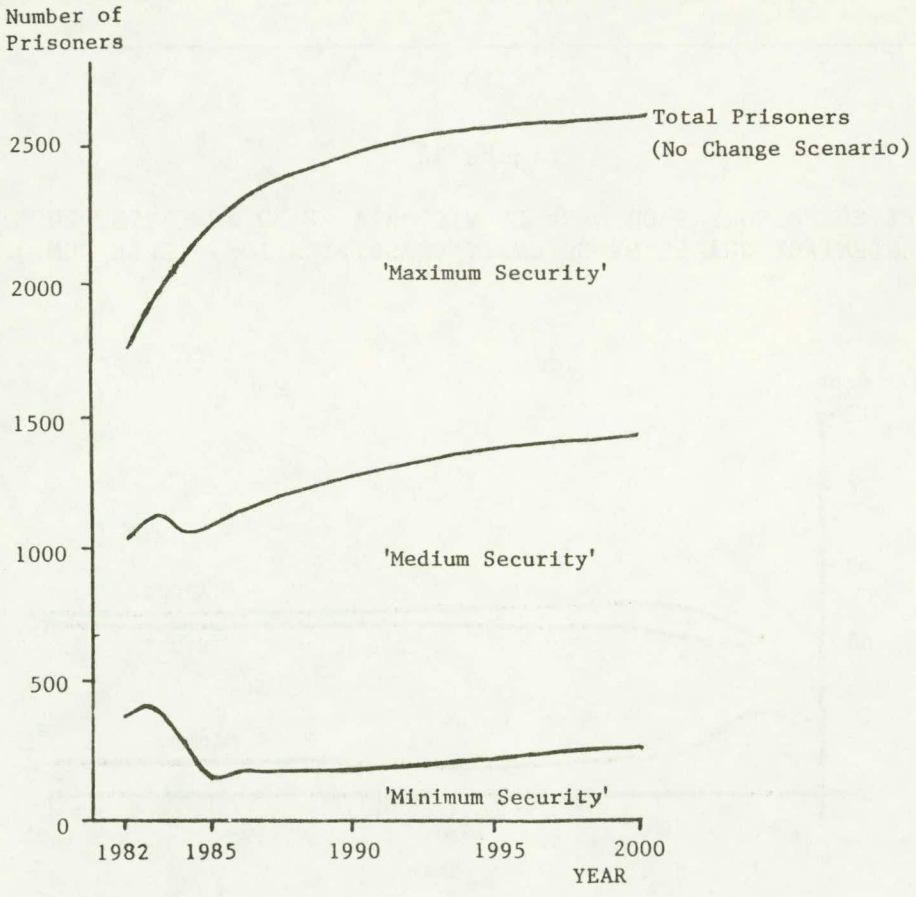


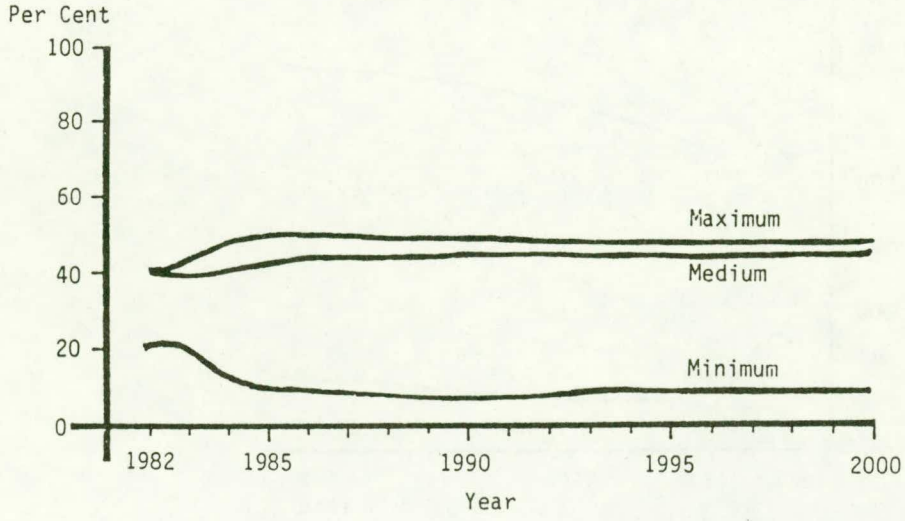
Table 8

PROJECTED PRISONERS ON HAND IN VICTORIA AT 30 JUNE 1982-2000
NUMBERS AND PERCENTAGES BY SECURITY CLASSIFICATION - BASE RUN

Year	Maximum		Medium		Minimum		Total
	No.	%	No.	%	No.	%	No.
1982	700	40	700	40	353	20	1753
1983	845	43	744	37	390	20	1979
1984	1011	48	855	40	259	12	2125
1985	1067	49	926	43	169	8	2162
1986	1097	49	965	43	181	8	2243
1987	1112	48	1007	44	184	8	2303
1988	1133	49	1026	44	174	7	2333
1989	1145	48	1057	45	176	7	2378
1990	1155	48	1081	45	185	7	2421
1991	1160	47	1098	45	197	8	2455
1992	1164	47	1116	45	215	8	2495
1993	1170	46	1133	45	227	9	2530
1994	1171	46	1139	45	226	9	2536
1995	1176	46	1149	45	230	9	2555
1996	1182	46	1158	45	235	9	2575
1997	1187	46	1165	45	237	9	2589
1998	1188	46	1167	45	237	9	2592
1999	1189	46	1169	45	238	9	2596
2000	1193	46	1172	45	238	9	2603

Figure 12

PROJECTED PRISONERS ON HAND IN VICTORIA AT 30 JUNE 1982-2000:
PERCENTAGE SHARES BY SECURITY CLASSIFICATION - BASE RUN



Non-Custodial Options for Adult Offenders

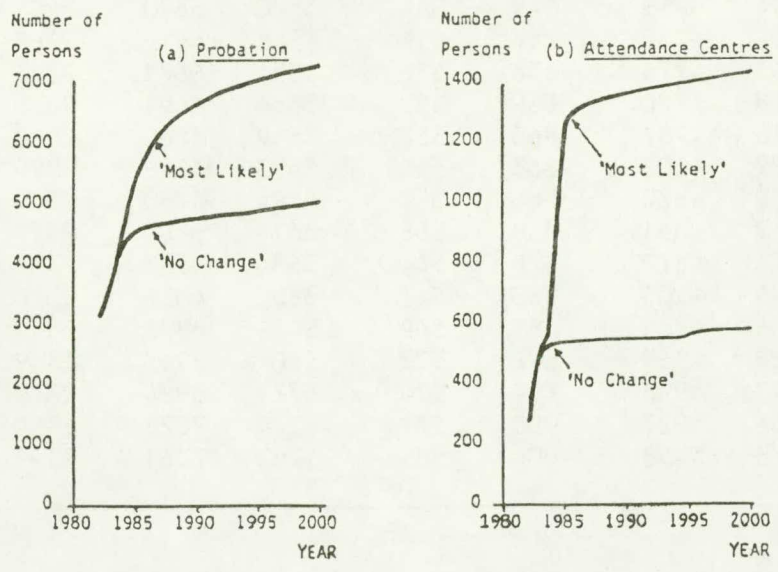
Of far more interest, particularly because of the cost implications, are the effects of the various scenarios on non-custodial client numbers, in particular the Probation system and the recently instituted Attendance Centres and Community Service Order Schemes. The results of the model are presented in Table 9 and Figure 13. Two runs of the model were made, using the 'no change' scenario and the 'most likely' scenario. The changes in sentencing practices implicit in the 'most likely' scenario produce significant increases in the workloads of the two non-custodial programmes. The detailed assumptions made are as follows:

- the 50 per cent of fine defaulters are transferred to attendance centres where they receive sentence lengths distributed according to offence type, as if they had been originally sentenced to attendance centres.

- the 50 per cent of those previously sentenced to under 6 months imprisonment are transferred equally to probation and attendance centres, according to their offence type, and given sentence lengths distributed as if they had originally been sentenced that type of disposition.

Figure 13

PROJECTED NUMBER OF PERSONS SERVING NON-CUSTODIAL SENTENCES IN VICTORIA AT 30 JUNE 1982-2000



Because the attendance centre option is of such recent origin it would be expected that a clientele would be building up rapidly, as in fact departmental records show over the past few years. The percentages of offenders sentenced to attendance centres have been increasing, and in consequence, so has the number of receivals. The considerable excess of receivals over completions accounts for the projected growth in 1982-83, and the assumption of stability in these disposition rates, coupled with the short periods served, explains the flattening out of the curves. With the longer sentences, probation shows a steadier climb, except where the policy changes occur.

Table 9

PROJECTED NUMBER OF PERSONS SERVING NON-CUSTODIAL SENTENCES IN VICTORIA: PERSONS RECEIVED DURING THE YEAR AND ON HAND AT 30 JUNE 1982-2000

Year	'No Change' Scenario				'Most Likely' Scenario			
	Probation		Attendance Centres		Probation		Attendance Centres	
	Rec'd	On hand at 30 June	Rec'd	On hand at 30 June	Rec'd	On hand at 30 June	Rec'd	On hand at 30 June
1982*	1910	3000	549	270	1910	3000	549	270
1983	2430	3850	828	517	2430	3850	828	517
1984	2450	4461	838	535	2450	4461	838	535
1985	2472	4650	844	540	3488	5666	2231	1287
1986	2494	4713	849	544	3520	6390	2252	1335
1987	2506	4752	857	551	3541	6616	2269	1356
1988	2513	4775	858	552	3554	6671	2276	1362
1989	2508	4780	859	552	3554	6691	2286	1372
1990	2515	4787	860	552	3559	6700	2292	1377
1991	2527	4800	863	555	3573	6719	2299	1382
1992	2539	4820	866	557	3595	6750	2309	1387
1993	2559	4851	868	558	3614	6784	2321	1396
1994	2571	4879	878	564	3634	6823	2332	1403
1995	2585	4903	883	567	3652	6856	2340	1408
1996	2606	4934	887	569	3679	6898	2349	1414
1997	2623	4969	892	572	3701	6943	2359	1421
1998	2637	4998	897	574	3721	6984	2369	1427
1999	2654	5027	900	577	3740	7021	2380	1434
2000	2673	5058	906	580	3764	7061	2391	1442

* Actual

PART IV

CONCLUSION

It is hoped that this model, and the description of it in this monograph, is sufficiently simple to be understood and used, yet at the same time sufficiently comprehensive in its approach and flexible in its requirements, to enable any interested corrections department to adapt it to its own circumstances.

The computer program listed in Appendices 1 and 2 is written in very simple FORTRAN for the Cyber 835 Computer systems operated by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Canberra. It is therefore readily available by arrangement with CSIRO and the Australian Institute of Criminology for use by government departments, through CSIRO terminals which are located in all major cities of Australia. It can be modified to suit any Fortran compiler, could be translated into Basic, and could in fact, in its present form, be run on many of the relatively modest personal computers which are available to small research offices. It could, with a little help from a competent programmer, be made fully conversational, so that for example, an administrator with little or no computer experience can be prompted by the computer program and asked to specify the values of input data required or select the precise nature of the assumptions to be made from a list of options displayed on the screen.

The sources of data have been discussed - The Australian Bureau of Statistics, the Police, the Courts and the Corrections Departments' own records. Some degree of imagination is sometimes necessary to complete the data requirements and where actual data are not available estimates have to be made. But even here, in using the model in Victoria, cross-checking of model outputs has always appeared successful in identifying bad data or implausible assumptions.

The model can be useful to practitioners throughout the criminal justice field - police, courts, legislators, prison administrators and probation or parole officers. Probably it is at its most useful when used simultaneously by all of these groups, each ensuring that their own particular items of data and assumptions are correct and adequate. This form of joint monitoring of system options often leads surreptitiously to an integrated approach to data collection in the justice system, which in itself is a worthwhile objective to the extent that it enables real evaluation of the operation of the system in action.

The problem of forecasting still remains, however. Forecasting models are not all-seeing crystal balls and can only mechanically work through the implications of the scenarios envisaged by the users of the model. Much depends on the imagination and interpreting powers of the user. However, as an aid to the imaginative user, this model should (I predict) be a powerful tool. Only time can really tell if I am correct!

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Appendix 1

GLOSSARY OF KEY VARIABLES

I =1(1982),.....19(2000)

J =1(<9yrs),2(9),3(10),4(11),....13(20),14(21-24),15(25-29),....21(55-59),22(60+),23(Total)

K =1(Male),2(Female),3(Total)

L =1(Homicide),....17(Traffic Offences),18(Total)

M =1(Juvenile Justice),2(Fine),3(Probation),4(Attendance Centre/C.S.O.),5(Bond/Recognisance),
6(Prison<6mths),7(6<12m),8(1<2yrs),9(2<3yrs),10(3<4yrs),11(4<5yrs),12(5<10yrs),13(10+yrs),
14(Life),15(Other),16(Total)

N =1(<2yrs),2(2<3yrs),3(3<4yrs),4(4<5yrs),5(5<10yrs),6(10+yrs),7(Life)

N1 =1(<1yr),....19(18<19yrs),20(19+yrs),21(Total)

N2 =1(<1yr),....5(4<5yrs),6(Total)

N3 =1(<3mths),2(3<6m),3(6<9m),4(9<12m),5(1<2yrs),6(2+yrs),7(Total)

ISC =1(Maximum Security),2(Medium),3(Minimum)

IPOP(J,K) =general POPulation in year I, by age (J) and sex (K)

ICRATE(J,K,L) =Conviction RATEs per 100000 population, by age (J), sex (K) and offence (L)

NCONV(J,K,L) =Number of persons CONVicted, by age (J), sex (K) and offence (L)

NXDISP(M,L) =Number of persons X DISPosition, by disposition (M) and offence (L)

DISP(M,L) =DISPosition rates (percentages) by disposition (M) and offence (L)

PRSEED(N1,N) =PRiSoners Expected Elisibility Date, by head sentence (N) and actual expected time to serve (N1)

NPRREC(N1,I) =Number of PRisoners RECeived in year I, by time to serve (N1)

NPRNOW(N1,I[,ISC]) =Number of PRisoners NOW (i.e. on hand at 30 June) in year I, by time to serve (N1) [by Security Class (ISC)]

PRBEED(N2,L) =PRoBationers EED, by offence (L) and time to serve (N2)

NPROBR(N2,I) =Number of PROBationers Received in year I, by time to serve (N2)

NPROBN(N2,I) =Number of PROBationers NOW (i.e. on hand at 30 June) in year I, by time to serve (N2)

ATCEED(N3,L) =ATtendance Centre trainees EED, by offence (L) and time to serve (N3)

NATTCR(N3,I) =Number of ATTendance Centre trainees Received in year I, by time to serve (N3)

NATNOW(N3,I) =Number of ATtendance Centre trainees NOW (i.e. on hand at 30 June) in year I, by time to serve (N3)

Appendix 2

THE PROGRAMS

(i) The standard program

Note that this version differs from that given in the first printing of this publication in the addition of graphical output (which can easily be suppressed if not required) and a greatly improved and simplified method of specifying scenario modifications through the new input file 'SCENES'. An example of such a file is listed at the end of this program.

```
FRUN,T10.
*INC,USER
PURGE,TAPE100/NA.
GET,TAPE11=QPROJ,TAPE12=QCRATE,TAPE13=QOFFSH,TAPE14=QDISP,TAPE15=PRISEED.
GET,TAPE16=PRBEED2,TAPE17=ATCEED2,TAPE19=SCENES,TAPE20=QPROJL,TAPE21=QPROJH.
DEFINE,TAPE100.
FTNAUG.
FTN5,L=0.
LDSET,LIB=FTNAUG.
LGO.
RETURN,TAPE100.
*EOS
      PROGRAM JJJJJ (TAPE11,TAPE12,TAPE13,TAPE14,TAPE15,TAPE16
     1,TAPE17,TAPE19,TAPE20,TAPE21,OUTPUT,TAPE18=OUTPUT)
      DIMENSION IPOP(23,3),ICRATE(23,2,17),NCONV(23,3,18)
     1,NXDISP(16,18),DISP(16,18),NPRREC(21,19),NPRNOW(21,19)
     2,PRBEED(5,17),ATCEED(6,17),PRSEED(20,7),NPROBR(6,19),NPROBN(6,19)
     3,NATTCR(7,19),NATNOW(7,19),XLAB(20),YLAB(20),DSIZE(4),CHARS(4),
     4,X(20),Y(20),NMODS(18)
      CHARACTER*12 NAMES(18)
C       THE FIRST SECTION INSERTS BASE YEAR NUMBERS OF PRISONERS, BY
C       EFFECTIVE SENTENCE REMAINING TO BE SERVED, INTO NPRREC AND NPRNOW.
C       THE 1982 PRISON CENSUS FIGURES WERE USED HERE. NPRREC WILL CONTAIN
C       PRISONERS RECEIVED EACH YEAR, WHILE NPRNOW WILL CONTAIN THE NUMBERS
C       ON HAND AT THE END OF YEAR.
C       SIMILARLY, NPROBR, NPROBN, NATTCR AND NATNOW WILL CONTAIN
C       NUMBERS RECEIVED AND ON HAND FOR PROBATION AND COMMUNITY
C       SERVICE ORDERS.
      DATA NPRREC,NPROBR,NATTCR/622,390,150,95,56,36,28,24,20,17,
     114,12,13,11,10,9,7,4,3,1,1522,378*0,1300,1000,553,50,0,2903,
     2108*0,180,130,100,50,52,0,512,126*0/,NPRNOW,NPROBN,NATNOW/646*0/
     3,RETAIN,REMRATE,PRERE,JPOP/.125,.333333,1.0,11/
     4, XLAB/4H1980,4H1985,4H1990,4H1995,16*4H2000/,YLAB/4H1500,4H2000,
     54H2500,17*4H3000/,DSIZE/.02,.04,.08,1.0/,CHARS/1H.,1H+,1HX,1H*/
C
C
      DO 100 N1=1,20
      NPRNOW(21,1)=NPRNOW(21,1)+NPRREC(N1,1)
  100 NPRNOW(N1,1)=NPRREC(N1,1)
      DO 101 N3=1,7
  101 NATNOW(N3,1)=NATTCR(N3,1)
      DO 102 N2=1,6
  102 NPROBN(N2,1)=NPROBR(N2,1)
C
C       NOW READ THE OFFENCE-NAMES (NAMES), THE CONVICTION-RATES (ICRATE),
C       THE DISPOSITION RATES (DISP), AND THE SENTENCE-LENGTH MATRICES
C       (PRSEED,PRBEED AND ATCEED).
C
      READ(13,3000)NAMES
 3000 FORMAT(A12)
      READ(12,*)ICRATE
      READ(14,*)DISP
      READ(15,*)PRSEED
      READ(16,*)PRBEED
      READ(17,*)ATCEED
      READ(19,1900)RUNNO,NMODS
 1900 FORMAT(A4,18I4)
```

```
C
C       NOW, FOR EACH YEAR (I=1 TO 18), WE MODIFY (IF REQUIRED) THE
C       DISPOSITION MATRIX (DISP) AND THE CONVICTION RATES (ICRATE),
C       READ THE POPULATION FIGURES (IPOP), CALCULATE AND PRINT THE
C       NUMBERS OF PERSONS CONVICTED (NCONV).
C
      DO 1 I=1,18
      IF(NMODS(I).EQ.0)GO TO 830
      DO 832 II=1,NMODS(I)
      READ(19,1901)IRT,L1,L2,M1,M2,MALT,PARAM
 1901 FORMAT(6I5,F15.0)
  832 CALL SCENARI(I,DISP,ICRATE,IRT,L1,L2,M1,M2,PARAM,MALT,NAMES,
     1PRERE,RETAIN,REMRATE,JPOP)
  830 READ(JPOP,*)IPOP
      DO 11 K=1,3
      DO 11 L=1,18
   11 NCONV(23,K,L)=0
      DO 2 J=1,22
      DO 21 K=1,3
   21 NCONV(J,K,18)=0
      DO 2 L=1,17
      DO 22 K=1,2
   22 NCONV(J,K,L)=IFIX(0.5+ICRATE(J,K,L)*IPOP(J,K)/1000.)
    2 NCONV(J,3,L)=NCONV(J,1,L)+NCONV(J,2,L)
      DO 3 J=1,22
      DO 3 K=1,3
      DO 3 L=1,17
    3 NCONV(J,K,18)=NCONV(J,K,18)+NCONV(J,K,L)
      DO 4 K=1,3
      DO 4 L=1,18
      DO 4 J=1,22
    4 NCONV(23,K,L)=NCONV(23,K,L)+NCONV(J,K,L)
      IF(I.EQ.1)WRITE(18,1801)RUNNO
 1801 FORMAT('1'////////////////////T60,A4)
      IF(I.EQ.1.OR.I.EQ.8.OR.I.EQ.18)WRITE(18,8000)1982+I,(NAMES(L),
     1((NCONV(J,K,L),J=1,23),K=1,3),L=1,18)
 8000 FORMAT(       '1NUMBER OF PERSONS CONVICTED BY AGE, SEX AND MOST SE
     1RIOUS OFFENCE - QUEENSLAND -',I5//'0AGE:<9    9   10   11   12   13   1
     24   15    16    17    18    19    20  21-4  25-9  30-4  35-9  40-4
     3 45-9 50-4 55-9  60+  TOTAL'/(' ',A12/' M',I5,4I4,3I5,10I6,4I5,
     4I7/' F',I5,4I4,3I5,10I6,4I5,I7/' T',I5,4I4,3I5,10I6,4I5,I7))
C
C       NOW CONVERT THE NUMBERS CONVICTED INTO PERSONS BY
C       DISPOSITION (NXDISP) AND PRINT.
  850 DO 8 L=1,16
      NXDISP(L,18)=0
    8 NXDISP(16,L)=0
      NXDISP(16,17)=0
      NXDISP(16,18)=0
      DO 10 M=1,15
      DO 10 L=1,17
      NXDISP(M,L)=IFIX(0.5+DISP(M,L)*NCONV(23,3,L)/100.)
      NXDISP(16,L)=NXDISP(16,L)+NXDISP(M,L)
   10 NXDISP(M,18)=NXDISP(M,18)+NXDISP(M,L)
      DO 112 L=1,17
  112 NXDISP(16,18)=NXDISP(16,18)+NXDISP(16,L)
      IF(I.EQ.1.OR.I.EQ.8.OR.I.EQ.18)WRITE(18,8100)1982+I
 8100 FORMAT('1NUMBER OF PERSONS BY MOST SERIOUS OFFENCE AND DISPOSITION
     1 - QUEENSLAND ',I6//'0      JUVENILE  FINE PROBN. C.S.O.  BOND, PRI
     2SON--(HEAD SENTENCES)',38('-'),'  OTHER     TOTAL'/
     3'       JUSTICE',15X,'        RECOG    <6M  6<12M  1<2YR  2<3YR  3
     4<4YR  4<5YR 5<10YR  >10YR   LIFE')
      IF(I.EQ.1.OR.I.EQ.8.OR.I.EQ.18)WRITE(18,8200)(NAMES(L),
     1(NXDISP(M,L),M=1,16),L=1,18)
 8200 FORMAT(' ',A12/7X,15I7,I10)
C
```

```
C     NOW WORK OUT THE ACTUAL SENTENCE LENGTHS TO BE SERVED,
C     FOR PRISONERS, PROBATIONERS AND PERSONS ON C.S.O.S.
C
      CALL EED(NXDISP,PRSEED,NPRREC,I)
      CALL PROB(NXDISP,PRBEED,NPROBR,I)
      CALL ATTC(NXDISP,ATCEED,NATTCR,I)
C
C     NOW ROW I+1 OF NPRREC CONTAINS THIS YEAR'S PRISON RECEIVALS BY EFFECTIVE
C     SENTENCE SO WE CAN COMPLETE ROW I+1 OF NPRNOW - THE END-OF-YEAR TOTALS.
C     RETAIN IS THE PROPORTION OF THOSE SENTENCED TO AN EFFECTIVE SENTENCE
C     OF LESS THAN ONE YEAR WHO WILL STILL BE IN JAIL AT THE END OF YEAR.
C     THE REMISSION SYSTEM IS REFLECTED IN THE PROCEDURE BY REDUCING THE
C     TIME REMAINING OF 'REMRATE' OF THE PRISONERS BY TWO YEARS, WHILE
C     THE OTHER ONE MINUS REMRATE ONLY REDUCE ONE YEAR.
C
      PROP=RETAIN
      PRE=PRERE
      DO 20 N1=1,18
      NPRNOW(N1,I+1)=IFIX(.5+PROP*NPRREC(N1,I+1)+
     1PRE*((1-REMRATE)*NPRNOW(1+N1,I)+REMRATE*NPRNOW(2+N1,I)))
      PROP=1.0
      PRE=1.0
   20 NPRNOW(21,I+1)=NPRNOW(21,I+1)+NPRNOW(N1,I+1)
      NPRNOW(19,I+1)=IFIX(.5+(1-REMRATE)*NPRNOW(20,I)+NPRREC(19,I+1))
      NPRNOW(20,I+1)=NPRREC(20,I+1)
      NPRNOW(21,I+1)=NPRNOW(21,I+1)+NPRNOW(19,I+1)+NPRNOW(20,I+1)
C
C     SIMILARLY ADD THIS YEARS RECEIVALS INTO PROBATION TO THE ON-HAND FIGURES
C
      PROP=0.1
      DO 201 N2=1,4
      NPROBN(N2,I+1)=IFIX(.5+PROP*NPROBR(N2,I+1)+NPROBN(1+N2,I))
      PROP=1.0
  201 NPROBN(6,I+1)=NPROBN(6,I+1)+NPROBN(N2,I+1)
      NPROBN(5,I+1)=NPROBR(5,I+1)
      NPROBN(6,I+1)=NPROBN(6,I+1)+NPROBN(5,I+1)
C
C     THE NEXT FEW LINES SIMULATE THE PASSAGE OF COMMUNITY SERVICE
C     ORDER PEOPLE THROUGH THE SYSTEM, IN THREE-MONTHLY
C     COHORTS - THIS IS NECESSARY BECAUSE OF THE RELATIVELY
C     SHORT PERIODS THEY SERVE.  THE STRANGE-LOOKING DECIMALS
C     ARE THE RESULT OF ASSUMING THAT RECEIVALS ON C.S.O.
C     ARRIVE EVENLY THROUGHOUT THE YEAR SO THAT FOR EXAMPLE THE NUMBER
C     ON HAND WITH UNDER 3 MONTHS TO SERVE IS MADE UP OF SOME OF THOSE
C     OF THE LAST QUARTER'S RECEIVALS SENTENCED TO LESS THAN 3 MONTHS
C     PLUS SOME OF THOSE SENTENCED EARLIER TO LONGER TERMS WHO HAVE SERVED
C     ALL BUT 3 MONTHS OF THEIR SENTENCE
C
C
      NATNOW(1,I+1)=IFIX(.5+.25*(NATTCR(1,I+1)+NATTCR(2,I+1)+
     1 NATTCR(3,I+1)+NATTCR(4,I+1)+NATNOW(5,I)))
      NATNOW(2,I+1)=IFIX(.5+(NATTCR(2,I+1)+NATTCR(3,I+1)+NATTCR(4,I+1))
     1 *.25+NATNOW(5,I)*.1875+(NATTCR(5,I+1)+NATNOW(6,I))*.0625)
      NATNOW(3,I+1)=IFIX(.5+.00390625*
     1(64*(NATTCR(3,I+1)+NATTCR(4,I+1))+36*NATNOW(5,I)+
     228*NATTCR(5,I+1)+24*NATNOW(6,I)+16*NATTCR(6,I+1)))
      NATNOW(4,I+1)=IFIX(.5+.00390625*(64*NATTCR(4,I+1)+37*
     1NATTCR(5,I+1)+10*NATTCR(6,I+1)+27*NATNOW(5,I)+54*NATNOW(6,I)))
      NATNOW(5,I+1)=IFIX(.5+.00390625*(175*NATTCR(5,I+1)+
     1 67*NATTCR(6,I+1)+81*NATNOW(5,I)+189*NATNOW(6,I)))
      NATNOW(6,I+1)=IFIX(.5+.00390625*(175*NATTCR(6,I+1)+
     1 81*NATNOW(6,I)))
      DO 202 N3=1,6
  202 NATNOW(7,I+1)=NATNOW(7,I+1)+NATNOW(N3,I+1)
C
C     NOW SUMMARISE THE YEAR'S INTAKES AND END-OF-YEAR MUSTERS
C
      WRITE(18,8010)1982+I,(NPRREC(N1,I+1),N1=1,21),
     1(NPRNOW(N1,I+1),N1=1,21)
 8010 FORMAT(/////' PRISONERS RECEIVED DURING',I5,', AND PRISONERS ON HA
     1ND AT END OF YEAR - BY TIME REMAINING TO SERVE.' /  '0TIME REMAINI
     2NG:'//'  <1YR 1<2YR 2<3YR 3<4YR 4<5YR 5<6YR 6<7YR 7<8YR 8<9YR 9<10Y
     3 10<11 11<12 12<13 13<14 14<15 15<16 16<17 17<18 18<19 19&+Y TOTAL
     4'//' PRISONERS RECEIVED:'/21I6/' PRISONERS ON HAND:'/21I6)
    1 CONTINUE
```

```
C
C       NOW WE HAVE RUN THROUGH THE FULL EIGHTEEN YEAR PERIOD - PRINT
C       SUMMARY TABLES TO SHOW THE TRENDS IN TOTAL CLIENT NUMBERS.
C
      WRITE(18,8011)(1981+I,(NPRREC(N1,I),N1=1,21),I=1,19)
     1,             (1981+I,(NPRNOW(N1,I),N1=1,21),I=1,19)
 8011 FORMAT('1SUMMARY OF PRISONERS RECEIVED DURING THE YEAR AND PRISONE
     1RS ON HAND AT END OF YEAR - BY TIME REMAINING TO SERVE - 1982-2000
     2.'/'0TIME REMAINING:'/' YEAR  <1YR 1<2YR 2<3YR 3<4YR 4<5YR 5<6YR 6
     3<7YR 7<8YR 8<9YR 9<10Y 10<11 11<12 12<13 13<14 14<15 15<16 16<17 1
     47<18 18<19 19&+Y TOTAL'/' PRISONERS RECEIVED:'/19(I5,21I6/)/' PRIS
     5ONERS ON HAND:'/19(I5,21I6/))
      WRITE(18,8012)(1981+I,(NATTCR(N3,I),N3=1,7),I=1,19)
     1,             (1981+I,(NATNOW(N3,I),N3=1,7),I=1,19)
 8012 FORMAT('1SUMMARY OF PERSONS RECEIVED ON COMMUNITY SERVICE ORDERS D
     1URING THE YEAR AND PERSONS ON HAND AT END OF YEAR - 1982-2000.'
     2/'0TIME REMAINING:'/' YEAR  <3MS 3<6MS 6<9MS 9<12M 1<2YR 2+YRS TOT
     3AL'/' PERSONS RECEIVED:'/19(I5,7I6/)/
     5' PERSONS ON HAND:'/19(I5,7I6/))
      WRITE(18,8013)(1981+I,(NPROBR(N2,I),N2=1,6),I=1,19)
     1,             (1981+I,(NPROBN(N2,I),N2=1,6),I=1,19)
 8013 FORMAT('1SUMMARY OF PROBATIONERS RECEIVED DURING THE YEAR AND ON H
     1AND AT END OF YEAR - 1982-2000'/'0TIME REMAINING: /' YEAR  <1YR 1<
     22YR 2<3YR 3<4YR 4<5YR TOTAL'/' PROBATIONERS RECEIVED:'/19(I5,6I6/)
     5/' PROBATIONERS ON HAND:'/19(I5,6I6/))
      DO 1357 I=1,19
      Y(I)=FLOAT(NPRNOW(21,I))
 1357 X(I)=1981.+FLOAT(I)
      CALL PLSETUP
      CALL XAXX(0.,8.,0.,4,5,XLAB,4HYEAR,4)
      CALL YAXX(0.,6.,0.,3,5,YLAB,11H  PRISONERS,11)
      CALL CURVE(X,Y,19,1980.,2000.,1500.,3000.,1.,RUNNO)
      CALL PLOT(1.,6.5,3)
      CALL TEXT(30HQLD PRISONER FORECASTING MODEL,30,4)
      CALL PLOT(2.,6.1,3)
      CALL TEXT(26HPROJECTED PRISONER NUMBERS,26,3)
      CALL ENDPLOT
      STOP
      END
C
C-------------------------------------------------------------------------
C
C
C       THE FOLLOWING ROUTINE WORKS OUT SENTENCE-LENGTHS FOR PRISONERS
C
      SUBROUTINE EED(NXDISP,PRSEED,NPRREC,I)
      DIMENSION NXDISP(16,18),PRSEED(20,7),NPRREC(21,19)
      IP1=I+1
      NXDISP(8,18)=NXDISP(8,18)+NXDISP(7,18)+NXDISP(6,18)
      DO 1 N1=1,20
      DO 1 N=1,7
    1 NPRREC(N1,IP1)=NPRREC(N1,IP1)+IFIX(.5+NXDISP(N+7,18)*
     1           PRSEED(N1,N)/100.)
      DO 2 N1=1,20
    2 NPRREC(21,IP1)=NPRREC(21,IP1)+NPRREC(N1,IP1)
      RETURN
      END
C
C       THE FOLLOWING ROUTINE WORKS OUT SENTENCE-LENGTHS FOR PROBATIONERS
C
      SUBROUTINE PROB(NXDISP,PRBEED,NPROBR,I)
      DIMENSION NXDISP(16,18),PRBEED(5,17),NPROBR(6,19)
      IP1=I+1
      DO 1 N2=1,5
      DO 1 L=1,17
    1 NPROBR(N2,IP1)=NPROBR(N2,IP1)+IFIX(.5+NXDISP(3,L)*
     1            PRBEED(N2,L)/100.)
      DO 2 N2=1,5
    2 NPROBR(6,IP1)=NPROBR(6,IP1)+NPROBR(N2,IP1)
      RETURN
      END
```

```
C
C-----------------------------------------------------------------------
C
C
C
C     THE FOLLOWING ROUTINE WORKS OUT SENTENCE-LENGTHS FOR ATT. CENTRE TRAINEES
C     OR C.S.O'S.
      SUBROUTINE ATTC(NXDISP,ATCEED,NATTCR,I)
      DIMENSION NXDISP(16,18),ATCEED(6,17),NATTCR(7,19)
      IF1=I+1
      DO 1 N3=1,6
      DO 1 L=1,17
    1 NATTCR(N3,IF1)=NATTCR(N3,IF1)+IFIX(.5+NXDISP(4,L)*
     1             ATCEED(N3,L)/100.)
      DO 2 N3=1,6
    2 NATTCR(7,IF1)=NATTCR(7,IF1)+NATTCR(N3,IF1)
      RETURN
      END
C
C-----------------------------------------------------------------------
C      THIS ROUTINE INCREASES (SENPER +VE) OR DECREASES (SENPER -VE) SENTENCE
C      LENGTHS FOR DETERMINATE PRISON SENTENCES BY SENPER PER CENT.  IT PERFORMS
C      THIS FEAT BY WORKING OUT WHAT PROPORTION (ADDPER) OF THOSE IMPRISONED
C      IN EACH SENTENCE LENGTH CATEGORY MUST BE SHIFTED INTO THE NEXT HIGHEST
C      (OR LOWEST) CATEGORY TO ACHIEVE THE DESIRED EFFECT.  THE TOTAL PERCENT
C      IMPRISONED (TOTPER) IS MAINTAINED CONSTANT.
C
      SUBROUTINE SENLEN(DISP,L,SENPER,NAME)
      DIMENSION DISP(16,18)
      CHARACTER*12 NAME
      TOTPER=DISP(6,L)+DISP(7,L)+DISP(8,L)+DISP(9,L)+DISP(10,L)+
     1   DISP(11,L)+DISP(12,L)+DISP(13,L)+DISP(14,L)
      IF(TOTPER.EQ.0.)RETURN
      YEARS=.3*DISP(6,L)+.6*DISP(7,L)+1.3*DISP(8,L)+2.3*DISP(9,L)+
     1   3.3*DISP(10,L)+4.3*DISP(11,L)+7.0*DISP(12,L)+12.0*DISP(13,L)
      AVSEN=(YEARS+20.*DISP(14,L))/TOTPER
      ADDYRS=YEARS*SENPER/100.
      IF(ADDYRS.GT.0)ADDPER=ADDYRS/(.3*DISP(6,L)+.7*DISP(7,L)+DISP(8,L)
     1+DISP(9,L)+DISP(10,L)+2.7*DISP(11,L)+5.*DISP(12,L)+8.*DISP(13,L))
      IF(ADDYRS.LT.0)ADDPER=ADDYRS/(.3*DISP(7,L)+.7*DISP(8,L)+DISP(9,L)
     1+DISP(10,L)+DISP(11,L)+2.7*DISP(12,L)+5.*DISP(13,L)+8.*DISP(14,L))
      TEM=DISP(6,L)
      DISP(6,L)=DISP(6,L)*(1.-ADDPER)
      IF(DISP(6,L).GE.0.)GO TO 849
      DISP(7,L)=DISP(7,L)+DISP(6,L)
      DISP(6,L)=0.
  849 DISP(14,L)=DISP(14,L)+ADDPER*DISP(13,L)
      DO 842 M=7,13
      TEM1=DISP(M,L)
      DISP(M,L)=DISP(M,L)+ADDPER*(TEM-DISP(M,L))
      IF(DISP(M,L).GE.0.)GO TO 842
      IF(M.LT.13)DISP(M+1,L)=DISP(M+1,L)+DISP(M,L)
      DISP(M,L)=0.
  842 TEM=TEM1
      TOTFIX=TOTPER/(DISP(6,L)+DISP(7,L)+DISP(8,L)+DISP(9,L)+
     1          DISP(10,L)+DISP(11,L)+DISP(12,L)+DISP(13,L)+DISP(14,L))
      DO 844 M=6,14
  844 DISP(M,L)=DISP(M,L)*TOTFIX
      AVS2=(.3*DISP(6,L)+.6*DISP(7,L)+1.3*DISP(8,L)+2.3*DISP(9,L)+3.3*DI
     1SP(10,L)+4.3*DISP(11,L)+7.*DISP(12,L)+12.*DISP(13,L)+20.*
     2DISP(14,L))/TOTPER
      WRITE(18,1850)NAME,(DISP(M,L),M=6,14),AVSEN,AVS2
 1850 FORMAT('ONEW SENTENCE LENGTH DISTRIBUTION FOR ',A12,':  ',9F6.2/
     1' AVERAGE SENTENCE CHANGED FROM ',F5.2,' YRS TO ',F5.2,' YRS.')
      RETURN
      END
```

```
C
C-----------------------------------------------------------------------
C
C       THIS SUBROUTINE READS AND INTERPRETS FILE 'SCENES'.
C       BEFORE EACH YEAR IS RUN, IT CHECKS TO SEE IF THERE ARE ANY
C       MODIFICATIONS TO BE MADE TO THE CONVICTIONS AND DISPOSITIONS
C       MATRICES, OR IF SENTENCE LENGTHS HAVE TO BE MODIFIED, OR
C       IF FACTORS SUCH AS THE REMISSION RATE, THE PRESENT-YEAR
C       RETENTION RATE (LENGTH OF SHORT SENTENCES), OR THE PRE-RELEASE
C       FAILURE RATE NEED TO BE ALTERED.  ALSO IF THE HIGH OR LOW
C       POPULATION PROJECTIONS ARE TO BE USED.  THE ROUTINE PRINTS
C       MESSAGES TO DOCUMENT THE PROJECTION OUTPUT.
C
      SUBROUTINE SCENARI(I,DISP,ICRATE,IRT,L1,L2,M1,M2,PARAM,MALT,
     1 NAMES,PRERE,RETAIN,REMRATE,JPOP)
      DIMENSION DISP(16,18),ICRATE(23,2,17)
      CHARACTER*12 NAMES(18)
      IF(IRT.NE.12)GO TO 1
      REMRATE=PARAM
      WRITE(18,1812)PARAM
 1812 FORMAT('0REMISSION RATE CHANGED TO ',F6.4)
      RETURN
    1 IF(IRT.NE.11)GO TO 2
      DO 3 L=L1,L2
    3 CALL SENLEN(DISP,L,PARAM,NAMES(L))
      RETURN
    2 IF(IRT.NE.10)GO TO 4
      JPOP=21
      WRITE(18,1810)
 1810 FORMAT('0HIGH POPULATION PROJECTION SELECTED')
      RETURN
    4 IF(IRT.NE.9)GO TO 5
      JPOP=20
      WRITE(18,1809)
 1809 FORMAT('0LOW POPULATION PROJECTION SELECTED')
      RETURN
    5 IF(IRT.LT.6)GO TO 6
      DO 7 J=M1,M2
      DO 7 L=L1,L2
      ICRATE(J,1,L)=ICRATE(J,1,L)+IFIX(.5+PARAM*ICRATE(J,1,L))
    7 ICRATE(J,2,L)=ICRATE(J,2,L)+IFIX(.5+PARAM*ICRATE(J,2,L))
      PARAM=100.*PARAM
      DO 77 L=L1,L2
   77 WRITE(18,1806)PARAM,NAMES(L),M1,M2
 1806 FORMAT('0',F8.2,' PER CENT CHANGE IN CONVICTION RATES FOR ',A12,
     1' COLUMNS',I3,' TO',I3)
      RETURN
    6 IF(IRT.NE.5)GO TO 8
      PRERE=PARAM
      WRITE(18,1805)PRERE
 1805 FORMAT('0PRE-RELEASE FAILURE RATE =',F6.2)
      RETURN
    8 IF(IRT.NE.3)GO TO 9
      RETAIN=PARAM
      WRITE(18,1803)RETAIN
 1803 FORMAT('0PRESENT YEAR RETENTION RATE =',F6.2)
      RETURN
    9 DO 10 L=L1,L2
      DO 10 M=M1,M2
      DISP(M,L)=DISP(M,L)+PARAM*DISP(MALT,L)
   10 DISP(MALT,L)=DISP(MALT,L)*(1.-PARAM)
      DO 1010 L=L1,L2
      DO 1010 M=M1,M2
 1010 WRITE(18,1801)PARAM,MALT,M,NAMES(L)
 1801 FORMAT('0',F8.4,' TIMES COLUMN',I3,' TRANSFERED TO COLUMN',
     1I3,' IN DISPOSITIONS FOR ',A12)
      RETURN
      END
C
```

```
C-----------------------------------------------------------------------
C
C       ALL THE REMAINING ROUTINES ARE REQUIRED FOR PLOTTER OUTPUT
C       OF THE TRENDS IN TOTAL PRISONER ON-HAND NUMBERS.  IF THIS
C       IS NOT REQUIRED THEY CAN ALL BE OMITTED.
C
      SUBROUTINE PLSETUP
      CALL RT7OPN(1,'TAPE100000',8)
      CALL SETPLOT(2HHP,0,0,1)
      CALL PLOT(6.,6.,0)
      CALL PLOT(-1.,-12.,1)
      CALL PLOTSET(4)
      CALL PLOT(1.,1.,3)
      CALL PLOT(0.,0.,1)
      RETURN
      END
C
      SUBROUTINE XAXX(X1,X2,Y,NTIC,NSTIC,XLAB,XNAME,NX)
      DIMENSION XLAB(20)
      CHARACTER*12 XNAME
      CALL PLOT(X1,Y,3)
      CALL PLOT(X2,Y,4)
      TIC=.2
      XINC=(X2-X1)/NTIC
      SXINC=XINC/NSTIC
      Y1=Y-TIC
      Y2=Y-.5*TIC
      NTP=NTIC+1
      DO 1 I=1,NTP
      P1=X1+(I-1)*XINC
      CALL PLOT(P1,Y1,3)
      CALL PLOT(P1,6.0,4)
      P2=P1-.3
      P3=Y1-.2
      CALL PLOT(P2,P3,3)
      CALL TEXT(XLAB(I),4,2)
      IF(I.EQ.NTP)GO TO 1
      NS=NSTIC-1
      DO 11 J=1,NS
      P2=P1+SXINC*J
      CALL PLOT(P2,Y2,3)
   11 CALL PLOT(P2,6.0,4)
    1 CONTINUE
      CALL PLOT(3.7,-1.,3)
      CALL TEXT(XNAME,NX,3)
      RETURN
      END
C
      SUBROUTINE YAXX(Y1,Y2,X,NTIC,NSTIC,YLAB,YNAME,NY)
      DIMENSION YLAB(20)
      CHARACTER*12 YNAME
      CALL PLOT(X,Y1,3)
      CALL PLOT(X,Y2,4)
      TIC=.2
      YINC=(Y2-Y1)/NTIC
      X1=X-TIC
      X2=X-.5*TIC
      SYINC=YINC/NSTIC
      NTP=NTIC+1
      DO 1 I=1,NTP
      P1=Y1+(I-1)*YINC
      CALL PLOT(X1,P1,3)
      CALL PLOT(8.,P1,4)
      P2=X1-.5
      P3=P1-.035
      CALL PLOT(P2,P3,3)
      CALL TEXT(YLAB(I),4,2)
      IF(I.EQ.NTP)GO TO 1
      NS=NSTIC-1
      DO 11 J=1,NS
      P2=P1+J*SYINC
      CALL PLOT(X2,P2,3)
      IF(I.NE.NTP.OR.J.NE.NS)GO TO 11
      CALL PLOT(X,P2,4)
      GO TO 1
   11 CALL PLOT(8.0,P2,4)
    1 CONTINUE
      CALL PLOT(-1.,5.,3)
      CALL TEXT(YNAME,-NY,3)
      RETURN
      END
C
```

```
C-----------------------------------------------------------------------
C
      SUBROUTINE CURVE(X,Y,N,XLO,XHI,YLO,YHI,DL,RUNNO)
      DIMENSION X(100),Y(100),XA(100),YA(100)
      XRA=8/(XHI-XLO)
      YRA=6/(YHI-YLO)
      DO 1 I=1,N
      XA(I)=(X(I)-XLO)*XRA
    1 YA(I)=(Y(I)-YLO)*YRA
      IF(DL.NE.1.)GO TO 3
      CALL PLOT(XA(1),YA(1),3)
      DO 2 I=2,N
    2 CALL PLOT(XA(I),YA(I),4)
      CALL PLOT(8.3,YA(19),3)
      CALL TEXT(RUNNO,4,2)
      RETURN
    3 NM1=N-1
      DO 4 I=1,NM1
      DIST=SQRT((XA(I)-XA(I+1))**2+(YA(I)-YA(I+1))**2)
      ND=IFIX(.5*DIST/DL+.5)
      SINTH=(YA(I+1)-YA(I))/DIST
      COSTH=(XA(I+1)-XA(I))/DIST
      X1=XA(I)
      Y1=YA(I)
      DO 5 J=1,ND
      CALL PLOT(X1,Y1,3)
      X1=X1+COSTH*DL
      Y1=Y1+SINTH*DL
      CALL PLOT(X1,Y1,4)
      X1=X1+COSTH*DL
      Y1=Y1+SINTH*DL
    5 CONTINUE
    4 CONTINUE
      CALL PLOT(8.3,YA(19),3)
      CALL TEXT(RUNNO,4,2)
      RETURN
      END
*EOR

C       THIS IS A TYPICAL EXAMPLE OF FILE 'SCENES'

OPTI   1   3   5   2   3   1   0   0   0   0   0   0   0   0   0   0   0   0
    9    0    0    0    0    0              0   1983 LOW POP PROJECTION
    3    0    0    0    0    0           .175   1984 RETENTION RATE RISE
   11    1   12    0    0    0           10.0   1984 SENTENCE LENGTHS RISE
    1    1   12    4    4    2          .0003   1984 C.S.O. COMMENCES
    6    3    3    9   13    0            .25   1985 INCREASE IN YOUTH SEX OFFS
    6    4    4    9   13    0            .50   1985 INCREASE IN YOUTH ROBBERY
    6    6    7    9   13    0            .25   1985 INCREASE IN YOUTH THEFT/B&E
    6   10   10    9   13    0            .25   1985 INCREASE IN YOUTH DRUG USE
   11    1   12    0    0    0           10.0   1985 SENTENCE LENGTHS RISE
    6    7    7    9   13    0            .10   1986 INCREASE IN YOUTH BURGLARY
   12    0    0    0    0    0           0.25   1986 REMISSION RATE REDUCED
    1    1   12   15   15    6            .28   1987 < 3 MTHS DIVERSION
    5    0    0    0    0    0            .75   1987 3 MTHS PRE-RELEASE
    1    1   12    4    4    6           .025   1987 FINE DEFAULTS TO CSO
    1    1   12    6    6    3           .007   1988 FAR NORTH PRISON
```

(ii) The program incorporating prisoner classifications

Note this is the original program written in 1984 for the Cyber 76, and contains none of the improvements since added to the standard model.

```
P,P5000.
COMMENT        THIS PROGRAM DOES NOT PROJECT NON-CUSTODIAL NUMBERS
               BEYOND THE DISPOSITION MATRIX STAGE NOR DOES IT INCORPORATE
               SENSITIVITY OPTIONS.   THE METHODOLOGY IS RATHER
               DIFFERENT FROM THAT OF THE STANDARD MODEL:  EACH COHORT OF RECEIVALS
               HAS ITS PRISON CAREER, INCLUDING PROGRESS THROUGH REMISSIONS AND
               THROUGH THE SECURITY CLASSIFICATIONS, MAPPED OUT AS THEY "ARRIVE".
               SURVIVORS OF SUCCESSIVE COHORTS ARE THEN SUMMED TO OBTAIN EACH
               YEARS ON-HAND FIGURES BY TIME REMAINING TO BE SERVED AND BY SECURITY
               CLASS.
ATTACH,ORACLE.
FUSE.
BORRO,P=VPROJ2,L=ORACLE,C=TAPE1.    POPULATION MATRIX
BORRO,P=VALLPC,L=ORACLE,C=TAPE2.    CONVICTION RATES MATRIX
BORRO,P=VOFFSH,L=ORACLE,C=TAPE3.    OFFENCE NAMES
BORRO,P=DISP4,L=ORACLE,C=TAPE4.     DISPOSITION RATES MATRIX
BORRO,P=PRISEED,L=ORACLE,C=TAPE5.   PRISON SENTENCE LENGTH MATRIX
FIN.
LGO.
*EOR
      PROGRAM JJJJJ (TAPE1,TAPE2,TAPE3,TAPE4,TAPE5,OUTPUT,TAPE8=OUTPUT)
      DIMENSION TPOP(23,3),ICRATE(23,2,17),NPERPA(23,3,18),NAMES(2,18)
     1,NXDISP(16,18),DISP(16,18),NPRREC(21,19),NPRNOW(21,19,3),PRSEED(20,7)
C
C       THE FIRST SECTION INSERTS BASE YEAR NUMBERS OF PRISONERS, BY
C       EFFECTIVE SENTENCE REMAINING TO BE SERVED AND BY SECURITY CLASS,
C       INTO NPRREC AND NPRNOW.
C       MODIFIED 1982 PRISON CENSUS FIGURES WERE USED HERE. NPRREC WILL
C       CONTAIN PRISONERS RECEIVED EACH YEAR, WHILE NPRNOW WILL CONTAIN THE
C       NUMBERS ON HAND AT THE END OF YEAR.
C
      DATA NPRNOW/239,218,44,48,20,16,15,15,13,11,9,5,0,6,15,16,10,
     14,4,0,0,378*0,436,153,50,20,10,10,9,6,2,2,2,9*0,0,378*0,
     2166,100,50,20,10,5,2,13*0,0,378*0/
      DO 100 N1=1,21
      DO 100 ISC=1,3
  100 NPRREC(N1,1)=NPRREC(N1,1)+NPRNOW(N1,1,ISC)
```

```
C
C       PRISONERS ON HAND AT BASE YEAR HAVE THEIR PRISON CAREER
C       MAPPED OUT - I.E. FOR EACH YEAR (N1) OF PROJECTION THEIR
C       TIME REMAINING TO SERVE AND THIER SECURITY CLASSIFICATION
C       ARE WORKED OUT AND THEY ARE INCLUDED IN THOSE FUTURE
C       "ON-HAND" NUMBERS (NPRNOW)
C
      DO 51 ISC=1,3
      DO 51 N1=2,20
      KK=0
      N1M1=N1-1
      DO 61 KKK=1,N1M1
      KK=KK+1
      IF(MOD(KKK,3).EQ.0)KK=KK+1
      N11=N1-KK
      N12=1+KKK
      IF(KK.GE.N1)GO TO 51
      IF (N12.GT.19)GO TO 51
      IF(4*KK.GE.N1)GO TO 52
      NPRNOW(N11,N12,ISC)=NPRNOW(N11,N12,ISC)+NPRNOW(N1,1,ISC)
      GO TO 61
   52 IF(2*KK.GE.N1)GO TO 53
      NPRNOW(N11,N12,ISC)=NPRNOW(N11,N12,ISC)+IFIX(.5+.333*NPRNOW(N1,1,ISC))
      NPRNOW(N11,N12,MINO(ISC+1,3))=NPRNOW(N11,N12,MINO(ISC+1,3))
     1+IFIX(.5+.667*NPRNOW(N1,1,ISC))
      GO TO 61
   53 NPRNOW(N11,N12,ISC)=NPRNOW(N11,N12,ISC)+IFIX(.5+.111*NPRNOW(N1,1,ISC))
      NPRNOW(N11,N12,MINO(ISC+1,3))=NPRNOW(N11,N12,MINO(ISC+1,3))+
     1IFIX(.5+.444*NPRNOW(N1,1,ISC))
      NPRNOW(N11,N12,MINO(I+2,3))=NPRNOW(N11,N12,MINO(I+2,3))+
     1IFIX(.5+.444*NPRNOW(N1,1,ISC))
   61 CONTINUE
   51 CONTINUE
```

```
C
C       NOW READ THE OFFENCE-NAMES (NAMES), THE APPEARANCE-RATES (ICRATE)
C       THE DISPOSITION RATES (DISP) AND THE SENTENCE LENGTH MATRIX (PRSEED)
C
      READ(3,3000)NAMES
 3000 FORMAT(A10,A2)
      READ(2,*)ICRATE
      READ(4,*)DISP
      READ(5,*)PRSEED
C
C       NOW, FOR EACH YEAR (N1=1 TO 18), WE READ THE POPULATION FIGURES
C       (IPOP), CALCULATE AND PRINT THE NUMBERS OF PERSONS PROCEEDED
C       AGAINST [CONVICTED], BY OFFENCE, AGE AND SEX (NPERPA).
C
      DO 1 I=1,18
      IP1=I+1
      READ(1,*)IPOP
      DO 11 K=1,3
      DO 11 L=1,18
   11 NPERPA(23,K,L)=0
      DO 2 J=1,22
      DO 21 K=1,3
   21 NPERPA(J,K,18)=0
      DO 2 L=1,17
      DO 22 K=1,2
   22 NPERPA(J,K,L)=IFIX(0.5+ICRATE(J,K,L)*IPOP(J,K)/1000.)
    2 NPERPA(J,3,L)=NPERPA(J,1,L)+NPERPA(J,2,L)
      DO 3 J=1,22
      DO 3 K=1,3
      DO 3 L=1,17
    3 NPERPA(J,K,18)=NPERPA(J,K,18)+NPERPA(J,K,L)
      DO 4 K=1,3
      DO 4 L=1,18
      DO 4 J=1,22
    4 NPERPA(23,K,L)=NPERPA(23,K,L)+NPERPA(J,K,L)
C
C       IF REQUIRED, PRINT MATRIX OF PERSONS CONVICTED
C
C       WRITE(8,8000)1982+I,(NAMES(1,L),NAMES(2,L),((NPERPA(J,K,L)
C     1,J=1,23),K=1,3),L=1,18)
 8000 FORMAT(*1NUMBER OF PERSONS CONVICTED BY AGE, SEX AND MOST SERIOUS
     1OFFENCE - VICTORIA -*,I5/         *0AGE:<9    9  10  11  12   13   1
     24  15    16    17    18    19    20  21-4  25-9  30-4  35-9  40-4
     345-9 50-4 55-9  60+  TOTAL*/(* *,A10,A2/* M*,I5,4I4,3I5,10I6,4I5,
     4I7/* F*,I5,4I4,3I5,10I6,4I5,I7/* T*,I5,4I4,3I5,10I6,4I5,I7))
```

```
C
C       NOW CONVERT THE NUMBERS CONVICTED INTO PERSONS BY
C       DISPOSITION (NXDISP) AND PRINT.
C
      DO 8 L=1,16
      NXDISP(L,18)=0
    8 NXDISP(16,L)=0
      DO 10 M=1,15
      DO 10 L=1,17
      NXDISP(M,L)=IFIX(0.5+DISP(M,L)*NPERPA(23,3,L)/100.)
      NXDISP(16,L)=NXDISP(16,L)+NXDISP(M,L)
   10 NXDISP(M,18)=NXDISP(M,18)+NXDISP(M,L)
      DO 112 L=1,16
  112 NXDISP(16,18)=NXDISP(16,18)+NXDISP(16,L)
C
C       IF REQUIRED, PRINT MATRIX OF PERSONS BY DISPOSITION
C
C       WRITE(8,8100)1982+I
 8100 FORMAT(*1NUMBER OF PERSONS BY MOST SERIOUS OFFENCE AND DISPOSITION
     1 - VICTORIA - *,I4/*0       POLICE   FINE PROBN. WELFR.  BOND, PRI
     2SON--(HEAD SENTENCES)*,38(*-*),*  OTHER     TOTAL*/
     3*        WARN.*,16X,*DEPT.   RECOG    <6M  6<12M  1<2YR  2<3YR  3<
     44YR  4<5YR 5<10YR  >10YR   LIFE*)
C       WRITE(8,8200)(NAMES(1,L),NAMES(2,L),(NXDISP(M,L),M=1,16),L=1,18)
 8200 FORMAT(* *,A10,A2/7X,1517,I10)
C
C     NOW WORK OUT THE ACTUAL SENTENCE LENGTHS TO BE SERVED
C
      CALL EED(NXDISP,PRSEED,NPRREC,ISC)
```

```
C
C     NOW ROW IP1 OF NPRREC CONTAINS THIS YEAR'S RECEIVALS BY EFFECTIVE
C     SENTENCE SO WE CAN NOW MAP OUT THEIR PRISON CAREER IN NPRNOW.
C      THE REMISSION SYSTEM IS REFLECTED IN VARIABLE KK WHICH REDUCES THE
C      TIME REMAINING OF ONE THIRD OF THE PRISONERS BY TWO YEARS, WHILE
C      THE OTHER TWO THIRDS ONLY REDUCE ONE YEAR.  PASSAGE THROUGH THE
C      SECURITY CLASSIFICATIONS IS REFLECTED IN THE FRACTIONS APPLIED TO NPRREC.
C
      NPRNOW(1,IP1,1)=NPRNOW(1,IP1,1)+IFIX(.5+.03*NPRREC(1,IP1))
      NPRNOW(1,IP1,2)=NPRNOW(1,IP1,2)+IFIX(.5+.03*NPRREC(1,IP1))
      NPRNOW(1,IP1,3)=NPRNOW(1,IP1,3)+IFIX(.5+.02*NPRREC(1,IP1))
      NPRNOW(2,IP1,1)=NPRNOW(2,IP1,1)+IFIX(.5+.4*NPRREC(2,IP1))
      NPRNOW(2,IP1,2)=NPRNOW(2,IP1,2)+IFIX(.5+.3*NPRREC(2,IP1))
      NPRNOW(2,IP1,3)=NPRNOW(2,IP1,3)+IFIX(.5+.2*NPRREC(2,IP1))
      NPRNOW(3,IP1,1)=NPRNOW(3,IP1,1)+IFIX(.5+.667*NPRREC(3,IP1))
      NPRNOW(3,IP1,2)=NPRNOW(3,IP1,2)+IFIX(.5+.333*NPRREC(3,IP1))
      DO 30 N1=4,20
   30 NPRNOW(N1,IP1,1)=NPRNOW(N1,IP1,1)+NPRREC(N1,IP1)
      DO 31 N1=2,20
      KK=0
      N1M1=N1-1
      DO 41 N11=1,N1M1
      KK=KK+1
      IF(MOD(N11,3).EQ.0)KK=KK+1
      N1MKK=N1-KK
      IP1P=IP1+N11
      IF(KK.GE.N1)GO TO 31
      IF (IP1P.GT.19)GO TO 31
      IF(3*KK.GE.N1)GO TO 32
      NPRNOW(N1MKK,IP1P,1)=NPRNOW(N1MKK,IP1P,1)+NPRREC(N1,IP1)
      GO TO 41
   32 IF(3*KK.GE.2*N1)GO TO 33
      NPRNOW(N1MKK,IP1P,1)=NPRNOW(N1MKK,IP1P,1)+IFIX(.5+.333*NPRREC(N1,IP1))
      NPRNOW(N1MKK,IP1P,2)=NPRNOW(N1MKK,IP1P,2)+IFIX(.5+.667*NPRREC(N1,IP1))
      GO TO 41
   33 NPRNOW(N1MKK,IP1P,1)=NPRNOW(N1MKK,IP1P,1)+IFIX(.5+.111*NPRREC(N1,IP1))
      NPRNOW(N1MKK,IP1P,2)=NPRNOW(N1MKK,IP1P,2)+IFIX(.5+.444*NPRREC(N1,IP1))
      NPRNOW(N1MKK,IP1P,3)=NPRNOW(N1MKK,IP1P,3)+IFIX(.5+.444*NPRREC(N1,IP1))
   41 CONTINUE
   31 CONTINUE
```

```
C
C       NOW PRINT A SUMMARY OF PRISONERS RECEIVED AND ON HAND FOR THE
C       YEAR, BY SECURITY CLASSIFICATION
C
C       WRITE(8,8010)1982+I,(NPRREC(J,IP1),J=1,20),((NPRNOW(J,IP1,K),J=1,20)
C      1,K=1,3)
 8010 FORMAT(/////* PRISONERS RECEIVED DURING*,I5,*, AND PRISONERS ON HA
     1ND AT END OF YEAR - BY TIME REMAINING TO SERVE.* /  *0TIME REMAINI
     2NG:*/*  <1YR 1<2YR 2<3YR 3<4YR 4<5YR 5<6YR 6<7YR 7<8YR 8<9YR 9<10Y
     3 10<11 11<12 12<13 13<14 14<15 15<16 16<17 17<18 18<19 19&+Y*/
     4  * PRISONERS RECEIVED:*/2016/* PRISONERS ON HAND BY SECURITY CLAS
     5SIFICATION:*/* MAX*,20I6/* MED*,20I6/* MIN*,20I6)
    1 CONTINUE
C
C       NOW WE HAVE COMPLETED THE PROJECTION PERIOD: COMPUTE ANNUAL TOTALS
C       BY SECURITY CLASSIFICATION
C
      DO 35 N1=1,20
      DO 35 I=1,19
      DO 35 ISC=1,3
   35 NPRNOW(21,I,ISC)=NPRNOW(21,I,ISC)+NPRNOW(N1,I,ISC)
C
C       PRINT A SUMMARY TABLE TO SHOW THE TRENDS IN TOTAL PRISONER NUMBERS BY SECURITY CLASS
C
      WRITE(8,8011)(1981+I,(NPRREC(J,ISC),J=1,21),I=1,19)
     1,(1981+I,((NPRNOW(J,I,K),J=1,21),K=1,3)
     2,((NPRNOW(J,I,1)+NPRNOW(J,I,2)+NPRNOW(J,I,3)),J=1,21),I=1,19)
 8011 FORMAT(*1SUMMARY OF PRISONERS RECEIVED DURING THE YEAR AND PRISONE
     1RS ON HAND AT END OF YEAR - BY TIME REMAINING TO SERVE - 1982-2000
     2.*/*0TIME REMAINING:*/* YEAR  <1YR 1<2YR 2<3YR 3<4YR 4<5YR 5<6YR 6
     3<7YR 7<8YR 8<9YR 9<10Y 10<11 11<12 12<13 13<14 14<15 15<16 16<17 1
     47<18 18<19 19&+Y TOTAL*/* PRISONERS RECEIVED:*/19(I5,21I6/)/* PRIS
     5ONERS ON HAND:*/19(I5,/* MAX *,21I6/* MED *,21I6/* MIN *,21I6/
     6* TOT *,21I6/))
      STOP
      END
      SUBROUTINE EED(NXDISP,PRSEED,NPRREC,I)
      DIMENSION NXDISP(16,18),PRSEED(20,7),NPRREC(21,19)
      IP1=I+1
      NXDISP(8,18)=NXDISP(8,18)+NXDISP(7,18)+NXDISP(6,18)
      NPRREC(1,IP1)=IFIX(.5+.002*NXDISP(2,18))
      DO 1 N1=1,20
      DO 1 N=1,7
    1 NPRREC(N1,IP1)=NPRREC(N1,IP1)+IFIX(.5+NXDISP(N+7,18)*PRSEED(N1,N)/100.)
      DO 2 N1=1,20
    2 NPRREC(21,IP1)=NPRREC(21,IP1)+NPRREC(N1,IP1)
      RETURN
      END
*EOR
```

Appendix 3

THE POPULATION PROJECTIONS

Population Projection Matrix (Most Likely)

AGE	9	10	11	12	13	14	15	16	17	18	19	20	21-4	25-9	30-4	35-9	40-4	45-9	50-4	55-9	60+	TOTAL
YEAR=1983																						
M 2675	303	355	355	355	355	355	335	335	335	335	335	349	1396	1639	1597	1458	1139	995	988	1006	2779	19774
F 2810	320	369	369	369	369	369	352	352	352	352	352	357	1429	1648	1601	1486	1186	1030	1026	1009	2273	19780
T 5485	623	724	724	724	724	724	687	687	687	687	687	706	2825	3287	3199	2945	2326	2025	2014	2016	5052	39558
YEAR=1984																						
M 2685	298	350	350	350	350	350	339	339	339	339	339	351	1406	1670	1611	1515	1178	1023	970	1009	2842	20003
F 2819	314	364	364	364	364	364	356	356	356	356	356	362	1450	1678	1623	1538	1220	1057	1009	1015	2324	20009
T 5505	612	715	715	715	715	715	696	696	696	696	696	714	2856	3349	3234	3053	2398	2080	1980	2025	5167	40028
YEAR=1985																						
M 2713	294	343	343	343	343	343	343	343	343	343	343	351	1405	1697	1627	1557	1237	1042	964	996	2903	20216
F 2849	310	358	358	358	358	358	360	360	360	360	360	365	1461	1705	1636	1581	1269	1082	996	1012	2374	20230
T 5563	604	701	701	701	701	701	703	703	703	703	703	716	2867	3403	3264	3138	2506	2125	1960	2009	5278	40453
YEAR=1986																						
M 2763	295	329	329	329	329	329	353	353	353	353	353	349	1397	1727	1630	1611	1277	1073	953	1001	2959	20445
F 2899	309	346	346	346	346	346	370	370	370	370	370	363	1453	1735	1656	1621	1306	1114	987	1012	2426	20461
T 5663	605	675	675	675	675	675	723	723	723	723	723	712	2850	3462	3287	3233	2584	2187	1941	2013	5386	40913
YEAR=1987																						
M 2824	296	318	318	318	318	318	359	359	359	359	359	346	1387	1753	1652	1595	1375	1109	963	980	3010	20675
F 2962	311	334	334	334	334	334	376	376	376	376	376	363	1452	1767	1669	1608	1403	1149	992	998	2472	20696
T 5787	608	653	653	653	653	653	735	735	735	735	735	710	2840	3521	3321	3203	2779	2259	1956	1978	5483	41385
YEAR=1988																						
M 2895	302	310	310	310	310	310	360	360	360	360	360	345	1381	1778	1667	1606	1458	1133	983	962	3055	20915
F 3033	316	327	327	327	327	327	377	377	377	377	377	362	1450	1800	1684	1620	1481	1174	1007	977	2521	20945
T 5928	619	638	638	638	638	638	737	737	737	737	737	707	2831	3579	3351	3226	2940	2307	1991	1940	5577	41871
YEAR=1989																						
M 2966	308	304	304	304	304	304	355	355	355	355	355	349	1397	1787	1695	1617	1514	1171	1011	944	3101	21155
F 3107	322	321	321	321	321	321	373	373	373	373	373	366	1466	1823	1711	1639	1531	1206	1033	961	2565	21200
T 6073	631	626	626	626	626	626	728	728	728	728	728	716	2864	3610	3407	3256	3045	2377	2044	1906	5666	42365
YEAR=1990																						
M 3045	318	301	301	301	301	301	349	349	349	349	349	354	1417	1792	1726	1635	1557	1230	1031	939	3137	21431
F 3190	332	318	318	318	318	318	366	366	366	366	366	371	1487	1842	1743	1655	1575	1256	1059	950	2605	21485
T 6236	651	619	619	619	619	619	715	715	715	715	715	726	2905	3634	3469	3291	3133	2486	2090	1890	5742	42923
YEAR=1991																						
M 3091	324	308	308	308	308	308	350	350	350	350	350	350	1402	1797	1746	1657	1574	1262	1072	965	3152	21682
F 3238	338	326	326	326	326	326	367	367	367	367	367	367	1472	1847	1763	1677	1593	1289	1101	976	2618	21744
T 6329	662	634	634	634	634	634	717	717	717	717	717	717	2874	3644	3509	3334	3167	2551	2173	1941	5770	43426
YEAR=1992																						
M 3137	329	316	316	316	316	316	351	351	351	351	351	347	1388	1801	1766	1679	1592	1295	1114	992	3167	21942
F 3286	344	334	334	334	334	334	369	369	369	369	369	363	1457	1852	1783	1700	1610	1323	1145	1004	2630	22012
T 6423	673	650	650	650	650	650	720	720	720	720	720	710	2845	3653	3549	3379	3202	2618	2259	1996	5797	43954
YEAR=1993																						
M 3184	335	324	324	324	324	324	353	353	353	353	353	343	1374	1806	1786	1702	1610	1329	1159	1020	3182	22215
F 3336	350	342	342	342	342	342	370	370	370	370	370	360	1442	1856	1803	1723	1629	1357	1190	1031	2643	22280
T 6520	685	666	666	666	666	666	723	723	723	723	723	703	2816	3662	3589	3425	3239	2686	2349	2051	5825	44493
YEAR=1994																						
M 3232	341	332	332	332	332	332	354	354	354	354	354	340	1360	1811	1806	1725	1628	1364	1205	1048	3198	22488
F 3386	356	350	350	350	350	350	371	371	371	371	371	356	1427	1861	1824	1746	1647	1393	1237	1060	2655	22553
T 6618	697	682	682	682	682	682	725	725	725	725	725	696	2787	3672	3630	3471	3275	2757	2442	2108	5853	45041
YEAR=1995																						
M 3280	346	340	340	340	340	340	355	355	355	355	355	336	1346	1815	1827	1748	1646	1400	1253	1077	3213	22762
F 3437	362	359	359	359	359	359	372	372	372	372	372	352	1412	1866	1845	1770	1665	1429	1287	1090	2668	22838
T 6717	708	699	699	699	699	699	727	727	727	727	727	688	2758	3681	3672	3518	3311	2829	2540	2167	5881	45600
YEAR=1996																						
M 3330	352	348	348	348	348	348	356	356	356	356	356	333	1332	1820	1847	1772	1665	1436	1302	1107	3228	23044
F 3488	368	368	368	368	368	368	374	374	374	374	374	349	1397	1871	1866	1794	1684	1467	1338	1120	2681	23133
T 6818	720	716	716	716	716	716	730	730	730	730	730	682	2729	3691	3713	3566	3349	2903	2640	2227	5909	46177
YEAR=1997																						
M 3379	359	357	357	357	357	357	358	358	358	358	358	329	1318	1825	1869	1796	1683	1474	1354	1138	3244	23343
F 3540	374	377	377	377	377	377	375	375	375	375	375	345	1383	1876	1887	1818	1703	1505	1391	1151	2694	23427
T 6919	733	734	734	734	734	734	733	733	733	733	733	674	2701	3701	3756	3614	3386	2979	2745	2289	5938	46770
YEAR=1998																						
M 3430	365	365	365	365	365	365	359	359	359	359	359	326	1304	1830	1890	1820	1702	1513	1408	1169	3260	23637
F 3594	381	386	386	386	386	386	376	376	376	376	376	342	1369	1881	1908	1842	1722	1545	1446	1183	2707	23730
T 7024	746	751	751	751	751	751	735	735	735	735	735	668	2673	3711	3798	3662	3424	3058	2854	2352	5967	47367
YEAR=1999																						
M 3482	371	374	374	374	374	374	360	360	360	360	360	323	1291	1834	1911	1845	1721	1552	1464	1202	3275	23941
F 3647	387	395	395	395	395	395	378	378	378	378	378	338	1355	1886	1930	1867	1741	1585	1503	1216	2720	24040
T 7129	758	769	769	769	769	769	738	738	738	738	738	661	2646	3720	3841	3712	3462	3137	2967	2418	5995	47981
YEAR=2000																						
M 3534	378	383	383	383	383	383	361	361	361	361	361	319	1278	1839	1933	1870	1740	1593	1522	1235	3291	24252
F 3702	394	405	405	405	405	405	379	379	379	379	379	335	1341	1890	1952	1892	1761	1627	1563	1250	2733	24360
T 7236	772	788	788	788	788	788	740	740	740	740	740	654	2619	3729	3885	3762	3501	3220	3085	2485	6024	48612

Population Projection Matrix (High Growth)

AGE	<9	9	10	11	12	13	14	15	16	17	18	19	20	21-4	25-9	30-4	35-9	40-4	45-9	50-4	55-9	60+	TOTAL
YEAR=1983																							
M	2684	304	356	356	356	356	356	336	336	336	336	336	350	1400	1644	1602	1463	1143	998	991	1009	2782	19830
F	2819	321	370	370	370	370	370	353	353	353	353	353	358	1433	1653	1606	1491	1190	1033	1029	1012	2276	19836
T	5503	625	726	726	726	726	726	689	689	689	689	689	708	2833	3297	3208	2954	2333	2031	2020	2021	5058	39666
YEAR=1984																							
M	2702	300	352	352	352	352	352	341	341	341	341	341	333	1415	1680	1621	1525	1185	1029	976	1015	2849	20115
F	2837	316	366	366	366	366	366	358	358	358	358	358	364	1459	1689	1633	1548	1228	1064	1015	1021	2330	20124
T	5539	616	718	718	718	718	718	699	699	699	699	699	717	2874	3369	3254	3073	2413	2093	1991	2036	5179	40239
YEAR=1985																							
M	2739	297	346	346	346	346	346	346	346	346	346	346	354	1418	1713	1642	1572	1249	1052	973	1005	2914	20388
F	2877	313	361	361	361	361	361	363	363	363	363	363	368	1475	1721	1651	1596	1281	1092	1005	1022	2383	20404
T	5616	610	707	707	707	707	707	709	709	709	709	709	722	2893	3434	3293	3168	2530	2144	1978	2027	5297	40792
YEAR=1986																							
M	2799	299	333	333	333	333	333	357	357	357	357	357	353	1415	1749	1650	1631	1293	1086	965	1014	2973	20677
F	2937	313	350	350	350	350	350	375	375	375	375	375	368	1471	1757	1677	1641	1322	1128	999	1025	2438	20701
T	5736	612	683	683	683	683	683	732	732	732	732	732	721	2886	3506	3327	3272	2615	2214	1964	2039	5411	41378
YEAR=1987																							
M	2870	301	323	323	323	323	323	365	365	365	365	365	351	1409	1781	1678	1620	1397	1126	978	995	3028	20974
F	3010	316	339	339	339	339	339	382	382	382	382	382	369	1475	1795	1695	1633	1425	1167	1008	1014	2487	20999
T	5880	617	662	662	662	662	662	747	747	747	747	747	720	2884	3576	3373	3253	2822	2293	1986	2009	5515	41973
YEAR=1988																							
M	2951	308	316	316	316	316	316	367	367	367	367	367	351	1407	1811	1698	1636	1485	1154	1002	980	3077	21275
F	3092	322	333	333	333	333	333	384	384	384	384	384	369	1477	1834	1716	1651	1509	1196	1026	995	2539	21311
T	6043	630	649	649	649	649	649	751	751	751	751	751	720	2884	3645	3414	3287	2994	2350	2028	1975	5616	42586
YEAR=1989																							
M	3033	315	311	311	311	311	311	363	363	363	363	363	357	1428	1826	1732	1653	1547	1197	1033	965	3127	21583
F	3177	329	328	328	328	328	328	381	381	381	381	381	374	1498	1863	1749	1675	1565	1233	1056	982	2587	21633
T	6210	644	639	639	639	639	639	744	744	744	744	744	731	2926	3689	3481	3328	3112	2430	2089	1947	5714	43216
YEAR=1990																							
M	3124	326	309	309	309	309	309	358	358	358	358	358	363	1453	1837	1769	1676	1596	1261	1057	963	3168	21928
F	3273	341	326	326	326	326	326	375	375	375	375	375	380	1524	1888	1787	1697	1615	1288	1086	974	2630	21988
T	6397	667	635	635	635	635	635	733	733	733	733	733	743	2977	3725	3556	3373	3211	2549	2143	1937	5798	43916
YEAR=1991																							
M	3181	333	317	317	317	317	317	360	360	360	360	360	360	1442	1848	1795	1704	1618	1298	1102	992	3187	22245
F	3332	348	336	336	336	336	336	377	377	377	377	377	377	1514	1899	1813	1724	1638	1325	1132	1004	2647	22318
T	6513	681	653	653	653	653	653	737	737	737	737	737	737	2956	3747	3608	3428	3256	2623	2234	1996	5834	44563
YEAR=1992																							
M	3239	340	326	326	326	326	326	362	362	362	362	362	358	1432	1858	1821	1732	1642	1336	1149	1023	3206	22576
F	3392	355	345	345	345	345	345	381	381	381	381	381	374	1503	1910	1839	1753	1661	1365	1181	1036	2662	22661
T	6631	695	671	671	671	671	671	743	743	743	743	743	732	2935	3768	3660	3485	3303	2701	2330	2059	5868	45237
YEAR=1993																							
M	3297	347	336	336	336	336	336	365	365	365	365	365	355	1421	1868	1848	1761	1666	1375	1199	1055	3225	22922
F	3455	362	354	354	354	354	354	383	383	383	383	383	372	1492	1920	1865	1783	1685	1404	1231	1067	2678	22999
T	6752	709	690	690	690	690	690	748	748	748	748	748	727	2913	3788	3713	3544	3351	2779	2430	2122	5903	45921
YEAR=1994																							
M	3358	354	345	345	345	345	345	367	367	367	367	367	353	1411	1879	1874	1790	1689	1415	1250	1087	3245	23265
F	3518	370	364	364	364	364	364	385	385	385	385	385	369	1481	1931	1893	1812	1709	1445	1284	1100	2694	23351
T	6876	724	709	709	709	709	709	752	752	752	752	752	722	2892	3810	3767	3602	3398	2860	2534	2187	5939	46616
YEAR=1995																							
M	3418	361	354	354	354	354	354	369	369	369	369	369	350	1401	1889	1902	1819	1713	1457	1304	1121	3264	23614
F	3582	377	374	374	374	374	374	387	387	387	387	387	366	1470	1942	1920	1842	1733	1487	1340	1134	2710	23708
T	7000	738	728	728	728	728	728	756	756	756	756	756	716	2871	3831	3822	3661	3446	2944	2644	2255	5974	47322
YEAR=1996																							
M	3481	368	364	364	364	364	364	372	372	372	372	372	348	1391	1900	1928	1850	1738	1499	1359	1156	3283	23981
F	3646	385	385	385	385	385	385	390	390	390	390	390	364	1458	1933	1948	1873	1758	1531	1397	1169	2727	24084
T	7127	753	749	749	749	749	749	762	762	762	762	762	712	2849	3853	3876	3723	3496	3030	2756	2325	6010	48065
YEAR=1997																							
M	3543	376	374	374	374	374	374	375	375	375	375	375	344	1380	1911	1957	1881	1762	1543	1418	1192	3303	24355
F	3712	392	395	395	395	395	395	393	393	393	393	393	361	1448	1964	1976	1904	1783	1576	1457	1205	2743	24461
T	7255	768	769	769	769	769	769	768	768	768	768	768	705	2828	3875	3933	3785	3545	3119	2875	2397	6046	48816
YEAR=1998																							
M	3608	384	384	384	384	384	384	377	377	377	377	377	342	1370	1922	1985	1911	1788	1589	1479	1228	3324	24735
F	3780	401	406	406	406	406	406	395	395	395	395	395	359	1438	1976	2004	1933	1809	1623	1519	1242	2760	24851
T	7388	785	790	790	790	790	790	772	772	772	772	772	701	2808	3898	3989	3846	3597	3212	2998	2470	6084	49586
YEAR=1999																							
M	3674	391	395	395	395	395	395	379	379	379	379	379	340	1360	1932	2013	1943	1813	1635	1542	1266	3343	25122
F	3848	408	417	417	417	417	417	398	398	398	398	398	356	1427	1987	2033	1967	1834	1670	1583	1281	2776	25245
T	7522	799	812	812	812	812	812	777	777	777	777	777	696	2787	3919	4046	3910	3647	3305	3125	2547	6119	50367
YEAR=2000																							
M	3740	400	405	405	405	405	405	381	381	381	381	381	337	1350	1943	2042	1976	1838	1683	1608	1305	3363	25515
F	3918	417	429	429	429	429	429	400	400	400	400	400	354	1417	1997	2062	1999	1861	1719	1651	1321	2793	25654
T	7658	817	834	834	834	834	834	781	781	781	781	781	691	2767	3940	4104	3975	3699	3402	3259	2626	6156	51169

Population Projection Matrix (Low Growth)

AGE	<9	9	10	11	12	13	14	15	16	17	18	19	20	21-4	25-9	30-4	35-9	40-4	45-9	50-4	55-9	60+	TOTAL
YEAR=1983																							
M	2656	301	353	353	353	353	353	334	334	334	334	334	348	1392	1634	1592	1453	1135	992	985	1003	2762	19688
F	2790	318	366	366	366	366	366	351	351	351	351	351	356	1424	1643	1596	1481	1182	1027	1023	1006	2259	19690
T	5446	619	719	719	719	719	719	685	685	685	685	685	704	2816	3277	3188	2934	2317	2019	2008	2009	5021	39378
YEAR=1984																							
M	2647	294	345	345	345	345	345	337	337	337	337	337	349	1397	1659	1601	1505	1171	1017	964	1003	2806	19823
F	2780	310	359	359	359	359	359	354	354	354	354	354	360	1441	1667	1613	1528	1212	1050	1003	1009	2295	19833
T	5427	604	704	704	704	704	704	691	691	691	691	691	709	2838	3326	3214	3033	2383	2067	1967	2012	5101	39656
YEAR=1985																							
M	2656	288	336	336	336	336	336	340	340	340	340	340	348	1392	1681	1612	1542	1225	1032	955	987	2848	19946
F	2789	303	350	350	350	350	350	357	357	357	357	357	362	1447	1689	1620	1566	1257	1072	987	1002	2329	19958
T	5445	591	686	686	686	686	686	697	697	697	697	697	710	2839	3370	3232	3108	2482	2104	1942	1989	5177	39904
YEAR=1986																							
M	2686	287	320	320	320	320	320	349	349	349	349	349	345	1379	1705	1609	1591	1261	1059	941	988	2885	20081
F	2818	300	336	336	336	336	336	365	365	365	365	365	358	1435	1713	1635	1600	1289	1100	974	999	2365	20091
T	5504	587	656	656	656	656	656	714	714	714	714	714	703	2814	3418	3244	3191	2550	2159	1915	1987	5250	40172
YEAR=1987																							
M	2725	286	307	307	307	307	307	353	353	353	353	353	341	1365	1725	1626	1570	1353	1091	948	964	2915	20209
F	2858	300	322	322	322	322	322	370	370	370	370	370	357	1429	1739	1643	1583	1381	1131	976	982	2394	20233
T	5583	586	629	629	629	629	629	723	723	723	723	723	698	2794	3464	3269	3153	2734	2222	1924	1946	5309	40442
YEAR=1988																							
M	2773	289	297	297	297	297	297	353	353	353	353	353	338	1355	1744	1635	1575	1430	1111	964	944	2940	20348
F	2906	303	313	313	313	313	313	370	370	370	370	370	355	1422	1766	1652	1589	1453	1152	988	958	2426	20385
T	5679	592	610	610	610	610	610	723	723	723	723	723	693	2777	3510	3287	3164	2883	2263	1952	1902	5366	40733
YEAR=1989																							
M	2821	293	289	289	289	289	289	347	347	347	347	347	341	1366	1747	1657	1581	1480	1145	989	923	2965	20488
F	2955	306	305	305	305	305	305	365	365	365	365	365	358	1433	1783	1673	1603	1497	1179	1010	940	2452	20539
T	5776	599	594	594	594	594	594	712	712	712	712	712	699	2799	3530	3330	3184	2977	2324	1999	1863	5417	41027
YEAR=1990																							
M	2874	300	284	284	284	284	284	340	340	340	340	340	345	1381	1747	1682	1594	1518	1199	1005	915	2979	20659
F	3011	313	300	300	300	300	300	357	357	357	357	357	362	1449	1795	1699	1613	1535	1224	1032	926	2474	20718
T	5885	613	584	584	584	584	584	697	697	697	697	697	707	2830	3542	3381	3207	3053	2423	2037	1841	5453	41377
YEAR=1991																							
M	2896	304	289	289	289	289	289	340	340	340	340	340	340	1362	1746	1696	1610	1529	1226	1041	937	2974	20806
F	3034	317	305	305	305	305	305	357	357	357	357	357	357	1430	1794	1713	1629	1548	1252	1070	948	2470	20872
T	5930	621	594	594	594	594	594	697	697	697	697	697	697	2792	3540	3409	3239	3077	2478	2111	1885	5444	41678
YEAR=1992																							
M	2917	306	294	294	294	294	294	340	340	340	340	340	336	1344	1744	1710	1626	1542	1254	1079	961	2968	20957
F	3056	320	311	311	311	311	311	357	357	357	357	357	351	1411	1793	1726	1646	1559	1281	1109	972	2465	21029
T	5973	626	605	605	605	605	605	697	697	697	697	697	687	2755	3537	3436	3272	3101	2535	2188	1933	5433	41986
YEAR=1993																							
M	2939	309	299	299	299	299	299	341	341	341	341	341	331	1326	1743	1724	1643	1554	1283	1119	984	2962	21117
F	3079	323	316	316	316	316	316	357	357	357	357	357	347	1392	1791	1740	1663	1572	1310	1149	995	2460	21186
T	6018	632	615	615	615	615	615	698	698	698	698	698	678	2718	3534	3464	3306	3126	2593	2268	1979	5422	42303
YEAR=1994																							
M	2961	312	304	304	304	304	304	341	341	341	341	341	327	1308	1742	1737	1659	1566	1312	1159	1008	2957	21273
F	3102	326	321	321	321	321	321	357	357	357	357	357	342	1373	1790	1755	1680	1584	1340	1190	1020	2455	21347
T	6063	638	625	625	625	625	625	698	698	698	698	698	669	2681	3532	3492	3339	3150	2652	2349	2028	5412	42620
YEAR=1995																							
M	2982	315	309	309	309	309	309	340	340	340	340	340	322	1291	1740	1752	1676	1578	1342	1201	1033	2951	21428
F	3124	329	326	326	326	326	326	357	357	357	357	357	337	1354	1789	1769	1697	1596	1370	1234	1045	2450	21509
T	6106	644	635	635	635	635	635	697	697	697	697	697	659	2645	3529	3521	3373	3174	2712	2435	2078	5401	42937
YEAR=1996																							
M	3004	318	314	314	314	314	314	340	340	340	340	340	318	1273	1739	1765	1693	1591	1372	1244	1058	2944	21589
F	3146	332	332	332	332	332	332	357	357	357	357	357	334	1335	1788	1783	1714	1609	1402	1279	1070	2445	21682
T	6150	650	646	646	646	646	646	697	697	697	697	697	652	2608	3527	3548	3407	3200	2774	2523	2128	5389	43271
YEAR=1997																							
M	3024	321	320	320	320	320	320	341	341	341	341	341	313	1255	1738	1780	1711	1603	1404	1290	1084	2938	21766
F	3168	335	337	337	337	337	337	357	357	357	357	357	329	1317	1787	1797	1732	1622	1433	1325	1096	2440	21851
T	6192	656	657	657	657	657	657	698	698	698	698	698	642	2572	3525	3577	3443	3225	2837	2615	2180	5378	43617
YEAR=1998																							
M	3046	324	324	324	324	324	324	341	341	341	341	341	309	1238	1737	1794	1728	1616	1436	1337	1110	2932	21932
F	3191	338	343	343	343	343	343	357	357	357	357	357	325	1300	1786	1811	1749	1635	1467	1373	1123	2435	22033
T	6237	662	667	667	667	667	667	698	698	698	698	698	634	2538	3523	3605	3477	3251	2903	2710	2233	5367	43965
YEAR=1999																							
M	3068	327	329	329	329	329	329	341	341	341	341	341	306	1221	1735	1808	1746	1628	1468	1385	1137	2925	22104
F	3213	341	348	348	348	348	348	358	358	358	358	358	320	1282	1784	1826	1766	1647	1500	1422	1150	2430	22211
T	6281	668	677	677	677	677	677	699	699	699	699	699	626	2503	3519	3634	3512	3275	2968	2807	2287	5355	44315
YEAR=2000																							
M	3089	330	335	335	335	335	335	340	340	340	340	340	301	1205	1734	1823	1763	1641	1502	1435	1165	2919	22282
F	3236	344	354	354	354	354	354	357	357	357	357	357	316	1264	1782	1841	1784	1661	1534	1474	1179	2424	22394
T	6325	674	689	689	689	689	689	697	697	697	697	697	617	2469	3516	3664	3547	3302	3036	2909	2344	5343	44676

Appendix 4

THE RESULTS (BASE RUN)

Number of Persons Proceeded Against by Age, Sex and Most Serious Offence - Victoria 1983

AGE:	<9	9	10	11	12	13	14	15	16	17	18	19	20	21-4	25-9	30-4	35-9	40-4	45-9	50-4	55-9	60+	TOTAL
HOMICIDE																							
M	0	0	0	0	0	0	0	0	0	1	1	3	3	25	20	14	9	6	4	3	2	3	94
F	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2	1	1	0	0	0	0	10
T	0	0	0	0	0	0	0	0	0	1	1	3	3	28	23	16	10	7	4	3	2	3	104
ASSAULTS																							
M	0	2	2	4	7	17	40	74	149	146	196	212	213	504	362	260	191	129	84	48	33	33	2706
F	0	0	0	0	0	2	11	17	22	24	12	21	4	31	26	22	18	5	4	3	0	0	222
T	0	2	2	4	7	19	51	91	171	170	208	233	217	535	388	282	209	134	88	51	33	33	2928
SEX ASSAULT																							
M	0	0	1	0	2	7	26	30	48	38	25	30	17	82	61	35	29	23	7	7	10	8	486
F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T	0	0	1	0	2	7	26	30	48	38	25	30	17	82	61	35	29	23	7	7	10	8	486
AGNST PERSON																							
M	0	0	0	1	0	0	2	1	5	4	12	13	19	49	21	11	6	5	0	0	0	0	149
F	0	0	0	0	0	0	1	0	1	0	1	1	0	1	5	0	0	0	0	0	0	0	10
T	0	0	0	1	0	0	3	1	6	4	13	14	19	50	26	11	6	5	0	0	0	0	159
ROBBERY ETC																							
M	0	1	1	0	4	3	5	8	16	22	22	17	22	63	49	16	9	5	2	1	0	0	266
F	0	0	0	0	0	1	0	1	2	2	2	1	0	4	2	0	0	0	0	0	0	0	15
T	0	1	1	0	4	4	5	9	18	24	24	18	22	67	51	16	9	5	2	1	0	0	281
BURGLARY																							
M	5	31	81	110	169	326	591	547	543	304	250	196	174	423	303	113	67	25	25	18	8	6	4315
F	0	3	8	11	16	32	36	32	31	21	10	11	16	31	16	8	7	5	3	0	0	0	297
T	5	34	89	121	185	358	627	579	574	325	260	207	190	454	319	121	74	30	28	18	8	6	4612
FRAUD ETC																							
M	0	0	2	5	8	17	20	35	37	39	60	73	72	272	262	203	166	84	55	37	25	19	1491
F	0	0	1	3	0	2	7	10	29	19	26	43	39	119	89	70	59	38	20	12	3	0	589
T	0	0	3	8	8	19	27	45	66	58	86	116	111	391	351	273	225	122	75	49	28	19	2080
RECEIVING																							
M	0	1	8	9	17	35	51	84	64	65	78	86	78	218	157	97	57	39	23	16	6	6	1195
F	0	1	1	0	1	7	10	17	9	6	10	10	12	34	21	14	10	6	3	2	0	0	174
T	0	2	9	9	18	42	61	101	73	71	88	96	90	252	178	111	67	45	26	18	6	6	1369
OTHER THEFT																							
M	8	39	104	212	364	582	975	1047	1198	808	851	662	490	951	569	375	309	208	183	199	180	364	10678
F	0	14	19	70	147	349	526	495	400	184	186	156	131	402	419	416	340	313	207	230	216	209	5429
T	8	53	123	282	511	931	1501	1542	1598	992	1037	818	621	1353	988	791	649	521	390	429	396	573	16107
PROP. DAMAGE																							
M	3	18	26	34	37	44	69	93	121	119	159	149	137	264	144	91	58	33	32	17	11	14	1673
F	0	2	4	3	4	6	8	6	7	5	5	5	2	19	8	14	10	4	3	5	1	0	121
T	3	20	30	37	41	50	77	99	128	124	164	154	139	283	152	105	68	37	35	22	12	14	1794
GOVT/JUSTICE																							
M	0	0	0	2	0	1	6	19	67	58	88	82	82	240	108	88	57	28	18	13	5	8	970
F	0	0	0	0	1	1	0	6	8	4	6	4	11	27	18	11	9	0	1	1	0	0	108
T	0	0	0	2	1	2	6	25	75	62	94	86	93	267	126	99	66	28	19	14	5	8	1078
PROSTITUTION																							
M	0	0	0	0	0	0	0	0	0	0	4	7	24	57	56	62	35	16	14	5	4	0	284
F	0	0	0	0	0	0	0	1	2	2	45	104	165	496	397	167	37	30	2	0	0	0	1448
T	0	0	0	0	0	0	0	1	2	2	49	111	189	553	453	229	72	46	16	5	4	0	1732
OFF. BEHAV'R																							
M	0	0	0	0	1	2	9	37	114	136	373	373	326	702	364	206	130	69	69	36	28	31	3006
F	0	0	0	0	0	2	2	3	7	14	30	46	20	63	30	14	18	11	4	3	0	0	267
T	0	0	0	0	1	4	11	40	121	150	403	419	346	765	394	220	148	80	73	39	28	31	3273
POSS WEAPONS																							
M	0	0	1	9	12	27	27	45	74	59	106	106	85	198	149	113	80	48	43	24	14	19	1239
F	0	0	0	0	0	0	0	1	0	1	4	3	0	6	7	5	1	0	0	0	0	0	28
T	0	0	1	9	12	27	27	46	74	60	110	109	85	204	156	118	81	48	43	24	14	19	1267
GOOD ORDER																							
M	0	8	13	26	35	44	102	113	171	154	227	175	157	297	290	268	258	166	100	80	35	33	2752
F	0	0	0	1	3	6	10	14	17	24	29	8	7	29	18	18	18	12	7	4	3	0	228
T	0	8	13	27	38	50	112	127	188	178	256	183	164	326	308	286	276	178	107	84	38	33	2980
DRUG OFFENCE																							
M	0	0	0	0	1	3	2	7	17	26	116	196	235	921	667	249	144	69	47	27	10	11	2748
F	0	0	0	0	0	0	0	1	5	11	26	31	42	174	91	22	15	7	3	1	0	0	429
T	0	0	0	0	1	3	2	8	22	37	142	227	277	1095	758	271	159	76	50	28	10	11	3177
TRAFFIC OFFS																							
M	0	0	0	0	0	0	27	2010	5025	8040	11055	14070	13088	41880	30731	14373	6561	4271	2239	1482	1132	1042	157026
F	0	0	0	0	0	0	0	264	528	792	1056	1320	1607	5359	3708	1201	557	445	386	385	0	0	17608
T	0	0	0	0	0	0	27	2274	5553	8832	12111	15390	14695	47239	34439	15574	7118	4716	2625	1867	1132	1042	174634
TOTAL																							
M	16	100	239	412	657	1108	1952	4150	7649	10019	13623	16450	15222	47146	34313	16574	8166	5224	2945	2013	1503	1597	191078
F	0	20	33	88	172	408	611	868	1068	1109	1448	1764	2056	6798	4858	1984	1100	877	643	646	223	209	26983
T	16	120	272	500	829	1516	2563	5018	8717	11128	15071	18214	17278	53944	39171	18558	9266	6101	3588	2659	1726	1806	218061

Number of Persons by Most Serious Offence and Disposition - Victoria 1983

	JUVENILE JUSTICE	FINE	PROBN.	ATT.CR /CSO.	BOND, RECOG	PRISON--(HEAD SENTENCES)---------- <6M	6<12M	1<2YR	2<3YR	3<4YR	4<5YR	5<10YR	>10YR	LIFE	OTHER	TOTAL
HOMICIDE	0	3	4	3	3	1	0	3	20	20	7	12	7	13	6	102
ASSAULTS	173	1449	141	76	665	302	38	20	6	3	3	0	0	0	50	2926
SEX ASSAULT	46	99	92	12	164	22	2	8	8	10	6	10	1	0	4	484
AGNST PERSON	18	13	10	0	18	4	6	7	36	13	13	20	0	0	1	159
ROBBERY ETC	11	13	86	19	39	5	0	19	17	17	13	32	7	0	1	279
BURGLARY	2029	470	526	161	618	332	180	92	9	5	5	0	0	0	180	4607
FRAUD ETC	208	813	162	12	622	160	42	21	2	6	2	0	0	0	29	2079
RECEIVING	218	542	120	44	283	104	27	10	3	1	1	0	0	0	14	1367
OTHER THEFT	5927	4607	676	225	3672	515	145	64	0	0	0	0	0	0	274	16105
PROP. DAMAGE	465	958	149	30	285	52	5	11	4	2	2	0	0	0	9	1972
GOVT/JUSTICE	111	600	15	11	129	132	11	2	1	0	0	0	0	0	66	1078
PROSTITUTION	2	1571	17	0	47	88	3	2	0	0	0	0	0	0	2	1732
OFF. BEHAV'R	92	2736	10	3	314	98	10	0	0	0	0	0	0	0	10	3273
POSS WEAPONS	180	879	10	1	143	35	4	5	3	1	0	0	0	0	1	1262
GOOD ORDER	524	1797	57	12	423	101	15	12	6	3	3	0	0	0	27	2980
DRUG OFFENCE	32	1884	108	10	759	124	51	13	67	38	38	25	3	13	10	3175
TRAFFIC OFFS	4436	163632	244	210	3667	1921	524	0	0	0	0	0	0	0	0	174634
TOTAL	14472	182066	2427	829	11851	3996	1063	289	182	119	93	99	18	26	684	218214

Number of Persons Proceeded Against by Age, Sex and Most Serious Offence - Victoria 1990

AGE:	<9	9	10	11	12	13	14	15	16	17	18	19	20	21-4	25-9	30-4	35-9	40-4	45-9	50-4	55-9	60+	TOTAL
HOMICIDE																							
M	0	0	0	0	0	0	0	0	0	1	1	3	4	26	22	16	10	8	5	3	2	3	104
F	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	2	2	2	0	0	0	0	13
T	0	0	0	0	0	0	0	0	0	1	1	3	4	29	26	18	12	10	5	3	2	3	117
ASSAULTS																							
M	0	2	2	3	6	15	34	77	155	152	204	221	216	512	396	281	214	176	103	51	31	38	2889
F	0	0	0	0	0	2	10	18	23	25	12	22	4	33	29	24	20	6	5	3	0	0	236
T	0	2	2	3	6	17	44	95	178	177	216	243	220	545	425	305	234	182	108	54	31	38	3125
SEX ASSAULT																							
M	0	0	1	0	2	6	22	31	50	40	27	32	17	84	66	38	33	31	9	7	9	9	514
F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T	0	0	1	0	2	6	22	31	50	40	27	32	17	84	66	38	33	31	9	7	9	9	514
AGNST PERSON																							
M	0	0	0	1	0	0	2	1	5	5	13	13	19	50	23	12	7	6	0	0	0	0	157
F	0	0	0	0	0	0	1	0	1	0	1	1	0	1	6	0	0	0	0	0	0	0	11
T	0	0	0	1	0	0	3	1	6	5	14	14	19	51	29	12	7	6	0	0	0	0	168
ROBBERY ETC																							
M	0	1	1	0	3	2	4	9	16	23	23	17	22	64	54	17	10	6	2	1	0	0	275
F	0	0	0	0	0	1	0	1	2	2	2	1	0	4	2	0	0	0	0	0	0	0	15
T	0	1	1	0	3	3	4	10	18	25	25	18	22	68	56	17	10	6	2	1	0	0	290
BURGLARY																							
M	6	32	69	94	144	276	501	570	565	317	260	204	176	429	332	123	75	34	31	19	8	6	4271
F	0	3	7	10	14	28	31	33	32	22	10	11	17	33	18	9	8	6	4	0	0	0	296
T	6	35	76	104	158	304	532	603	597	339	270	215	193	462	350	132	83	40	35	19	8	6	4567
FRAUD ETC																							
M	0	0	2	4	7	15	17	36	38	41	63	76	73	276	287	219	186	115	68	38	23	22	1606
F	0	0	1	3	0	2	6	10	30	20	27	45	40	123	99	77	66	50	24	13	3	0	639
T	0	0	3	7	7	17	23	46	68	61	90	121	113	399	386	296	252	165	92	51	26	22	2245
RECEIVING																							
M	0	1	7	7	14	29	43	87	66	68	82	90	79	221	172	105	64	53	28	16	6	6	1244
F	0	1	1	0	1	6	9	18	10	6	10	10	13	36	24	16	12	8	4	2	0	0	187
T	0	2	8	7	15	35	52	105	76	74	92	100	92	257	196	121	76	61	32	18	6	6	1431
OTHER THEFT																							
M	9	41	88	180	309	493	827	1091	1248	842	886	690	497	965	622	406	347	285	226	207	168	411	10838
F	0	15	16	60	127	301	453	514	416	191	193	162	136	418	468	453	379	416	252	237	203	240	5650
T	9	56	104	240	436	794	1280	1605	1664	1033	1079	852	633	1383	1090	859	726	701	478	444	371	651	16488
PROP. DAMAGE																							
M	3	19	22	29	32	37	59	97	126	124	165	156	139	268	158	98	65	45	39	18	10	16	1725
F	0	2	3	3	3	5	7	7	7	5	5	5	2	19	9	16	12	5	4	5	1	0	125
T	3	21	25	32	35	42	66	104	133	129	170	161	141	287	167	114	77	50	43	23	11	16	1850
GOVT/JUSTICE																							
M	0	0	0	2	0	1	5	20	70	60	91	85	83	244	118	95	64	39	22	13	5	9	1026
F	0	0	0	0	1	1	0	7	8	4	6	4	12	28	20	12	10	0	1	1	0	0	115
T	0	0	0	2	1	2	5	27	78	64	97	89	95	272	138	107	74	39	23	14	5	9	1141
PROSTITUTION																							
M	0	0	0	0	0	0	0	0	0	0	4	8	24	58	61	67	39	22	17	5	4	0	309
F	0	0	0	0	0	0	0	1	2	2	46	108	171	516	444	181	41	39	3	0	0	0	1554
T	0	0	0	0	0	0	0	1	2	2	50	116	195	574	505	248	80	61	20	5	4	0	1863
OFF. BEHAV'R																							
M	0	0	0	0	1	2	8	38	118	142	388	389	331	713	398	223	146	95	85	37	26	35	3175
F	0	0	0	0	0	2	2	3	7	15	31	48	20	65	33	16	20	14	5	3	0	0	284
T	0	0	0	0	1	4	10	41	125	157	419	437	351	778	431	239	166	109	90	40	26	35	3459
POSS WEAPONS																							
M	0	0	1	7	10	23	23	47	77	61	110	110	86	201	163	123	90	65	53	25	13	22	1310
F	0	0	0	0	0	0	0	1	0	1	4	3	0	6	7	5	2	0	0	0	0	0	29
T	0	0	1	7	10	23	23	48	77	62	114	113	86	207	170	128	92	65	53	25	13	22	1339
GOOD ORDER																							
M	0	9	11	22	30	37	86	117	178	161	236	182	159	302	317	290	289	227	124	84	33	38	2932
F	0	0	0	1	3	5	9	14	17	25	30	8	7	30	20	19	20	16	9	4	3	0	240
T	0	9	11	23	33	42	95	131	195	186	266	190	166	332	337	309	309	243	133	88	36	38	3172
DRUG OFFENCE																							
M	0	0	0	0	1	2	2	7	17	27	121	204	238	935	729	269	162	95	58	28	9	13	2917
F	0	0	0	0	0	0	0	1	5	12	27	33	43	181	101	24	17	9	4	1	0	0	458
T	0	0	0	0	1	2	2	8	22	39	148	237	281	1116	830	293	179	104	62	29	9	13	3375
TRAFFIC OFFS																							
M	0	0	0	0	0	0	23	2094	5235	8376	11517	14658	13275	42510	33600	15534	7358	5839	2768	1547	1056	1176	166566
F	0	0	0	0	0	0	0	275	549	824	1098	1373	1670	5576	4145	1307	621	591	471	397	0	0	18897
T	0	0	0	0	0	0	23	2369	5784	9200	12615	16031	14945	48086	37745	16841	7979	6430	3239	1944	1056	1176	185463
TOTAL																							
M	18	105	204	349	559	938	1656	4322	7964	10440	14191	17138	15438	47858	37518	17916	9159	7141	3638	2099	1403	1804	201858
F	0	21	28	77	149	353	528	903	1109	1154	1502	1834	2135	7072	5429	2161	1230	1162	786	666	210	240	28749
T	18	126	232	426	708	1291	2184	5225	9073	11594	15693	18972	17573	54930	42947	20077	10389	8303	4424	2765	1613	2044	230607

Number of Persons by Most Serious Offence and Disposition - Victoria 1990

	JUVENILE JUSTICE	FINE	PROBN.	ATT.CR /CSO.	BOND, RECOG	PRISON--(HEAD SENTENCES)---------- <6M	6<12M	1<2YR	2<3YR	3<4YR	4<5YR	5<10YR	>10YR	LIFE	OTHER	TOTAL
HOMICIDE	0	3	5	3	3	2	0	3	22	22	8	14	8	15	7	115
ASSAULTS	184	1547	150	81	709	322	41	22	6	3	3	0	0	0	53	3121
SEX ASSAULT	49	105	97	12	174	24	2	8	9	10	6	10	2	0	5	513
AGNST PERSON	19	13	10	0	19	4	6	8	38	14	14	21	0	0	2	168
ROBBERY ETC	11	14	89	20	41	6	0	20	18	18	14	33	7	0	1	292
BURGLARY	2009	466	521	160	612	329	178	91	9	5	5	0	0	0	178	4563
FRAUD ETC	225	878	175	13	671	173	45	22	2	7	2	0	0	0	31	2244
RECEIVING	228	567	126	46	296	109	29	10	3	1	1	0	0	0	14	1430
OTHER THEFT	6068	4716	692	231	3759	528	148	66	0	0	0	0	0	0	280	16488
PROP. DAMAGE	479	988	154	31	294	54	6	11	4	2	2	0	0	0	9	2034
GOVT/JUSTICE	118	636	16	11	137	139	11	2	1	0	0	0	0	0	70	1141
PROSTITUTION	2	1690	19	0	50	95	4	2	0	0	0	0	0	0	2	1864
OFF. BEHAV'R	97	2892	10	3	332	104	10	0	0	0	0	0	0	0	10	3458
POSS WEAPONS	190	929	11	1	151	37	4	5	3	1	0	0	0	0	1	1333
GOOD ORDER	558	1913	60	13	450	108	16	13	6	3	3	0	0	0	29	3172
DRUG OFFENCE	34	2001	115	10	807	132	54	14	71	41	41	27	3	14	10	3374
TRAFFIC OFFS	4711	173779	260	223	3895	2040	556	0	0	0	0	0	0	0	0	185464
TOTAL	14982	193137	2510	858	12400	4206	1110	297	192	127	99	105	20	29	702	230774

Number of Persons Proceeded Against by Age, Sex and Most Serious Offence - Victoria 2000

AGE:	<9	9	10	11	12	13	14	15	16	17	18	19	20	21-4	25-9	30-4	35-9	40-4	45-9	50-4	55-9	60+	TOTAL
HOMICIDE																							
M	0	0	0	0	0	0	0	0	0	1	1	3	3	23	22	17	11	9	6	5	2	3	106
F	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	2	2	2	0	0	0	0	13
T	0	0	0	0	0	0	0	0	0	1	1	3	3	26	26	19	13	11	6	5	2	3	119
ASSAULTS																							
M	0	2	2	4	7	19	43	80	161	157	211	229	195	461	406	315	245	197	134	75	41	39	3023
F	0	0	0	0	0	2	12	18	23	25	13	23	4	30	30	27	23	7	7	5	0	0	249
T	0	2	2	4	7	21	55	98	184	182	224	252	199	491	436	342	268	204	141	80	41	39	3272
SEX ASSAULT																							
M	0	0	1	0	2	8	28	32	51	41	27	33	15	75	68	43	37	35	11	11	12	10	540
F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T	0	0	1	0	2	8	28	32	51	41	27	33	15	75	68	43	37	35	11	11	12	10	540
AGNST PERSON																							
M	0	0	0	1	0	0	2	1	5	5	13	14	17	45	24	14	7	7	0	0	0	0	155
F	0	0	0	0	0	0	1	0	1	0	1	1	0	1	6	0	0	0	0	0	0	0	11
T	0	0	0	1	0	0	3	1	6	5	14	15	17	46	30	14	7	7	0	0	0	0	166
ROBBERY ETC																							
M	0	1	1	0	4	3	5	9	17	24	24	18	20	58	55	19	11	7	3	2	0	0	281
F	0	0	0	0	0	1	0	1	2	2	2	1	0	4	2	0	0	0	0	0	0	0	15
T	0	1	1	0	4	4	5	10	19	26	26	19	20	62	57	19	11	7	3	2	0	0	296
BURGLARY																							
M	7	39	88	119	183	352	638	590	585	327	269	211	159	387	340	137	86	38	40	27	10	7	4639
F	0	4	9	13	18	35	39	34	33	23	11	12	15	30	19	10	9	7	5	0	0	0	326
T	7	43	97	132	201	387	677	624	618	350	280	223	174	417	359	147	95	45	45	27	10	7	4965
FRAUD ETC																							
M	0	0	2	5	8	19	21	37	39	42	65	79	66	249	294	245	213	129	88	56	31	23	1711
F	0	0	1	3	0	2	7	10	31	21	28	47	36	111	102	86	76	56	31	19	4	0	671
T	0	0	3	8	8	21	28	47	70	63	93	126	102	360	396	331	289	185	119	75	35	23	2382
RECEIVING																							
M	0	1	8	9	18	38	55	90	69	70	84	93	71	199	177	118	73	59	37	24	7	7	1307
F	0	1	1	0	1	7	11	18	10	6	11	11	12	32	25	18	13	9	5	3	0	0	194
T	0	2	9	9	19	45	66	108	79	76	95	104	83	231	202	136	86	68	42	27	7	7	1501
OTHER THEFT																							
M	11	49	112	229	393	628	1052	1128	1291	871	917	713	448	870	638	454	396	318	293	306	221	431	11769
F	0	18	21	77	161	383	577	532	431	198	200	168	123	377	480	508	433	465	327	350	268	251	6348
T	11	67	133	306	554	1011	1629	1660	1722	1069	1117	881	571	1247	1118	962	829	783	620	656	489	682	18117
PROP. DAMAGE																							
M	4	23	28	37	40	47	75	100	130	128	171	161	125	242	162	110	75	50	51	26	14	16	1815
F	0	2	4	3	4	6	9	7	8	5	5	5	2	17	9	18	13	5	5	8	1	0	136
T	4	25	32	40	44	53	84	107	138	133	176	166	127	259	171	128	88	55	56	34	15	16	1951
GOVT/JUSTICE																							
M	0	0	0	2	0	1	7	21	73	62	95	88	75	220	121	106	73	44	29	20	6	10	1053
F	0	0	0	0	1	1	0	7	9	4	6	4	11	25	21	14	11	0	2	2	0	0	118
T	0	0	0	2	1	2	7	28	82	66	101	92	86	245	142	120	84	44	31	22	6	10	1171
PROSTITUTION																							
M	0	0	0	0	0	0	0	0	0	0	4	8	22	52	63	75	45	24	22	8	5	0	328
F	0	0	0	0	0	0	0	1	2	2	48	112	155	465	455	203	47	44	3	0	0	0	1537
T	0	0	0	0	0	0	0	1	2	2	52	120	177	517	518	278	92	68	25	8	5	0	1865
OFF. BEHAV'R																							
M	0	0	0	0	1	2	10	39	122	147	401	402	298	643	408	249	166	106	110	55	35	36	3230
F	0	0	0	0	0	2	2	3	8	15	33	50	18	59	34	18	23	16	7	5	0	0	293
T	0	0	0	0	1	4	12	42	130	162	434	452	316	702	442	267	189	122	117	60	35	36	3523
POSS WEAPONS																							
M	0	0	1	9	13	29	29	49	80	63	114	114	78	181	167	137	103	73	68	37	17	23	1385
F	0	0	0	0	0	0	0	1	0	1	4	3	0	5	8	6	2	0	0	0	0	0	30
T	0	0	1	9	13	29	29	50	80	64	118	117	78	186	175	143	105	73	68	37	17	23	1415
GOOD ORDER																							
M	0	11	15	28	38	47	110	121	184	166	244	188	143	272	326	325	331	254	161	123	43	39	3169
F	0	0	0	1	3	6	11	15	18	26	31	9	7	27	21	21	23	18	11	6	4	0	258
T	0	11	15	29	41	53	121	136	202	192	275	197	150	299	347	346	354	272	172	129	47	39	3427
DRUG OFFENCE																							
M	0	0	0	0	1	3	2	7	18	28	125	211	215	843	748	302	185	106	75	41	12	13	2935
F	0	0	0	0	0	0	0	1	5	12	28	34	39	164	104	27	19	11	5	2	0	0	451
T	0	0	0	0	1	3	2	8	23	40	153	245	254	1007	852	329	204	117	80	43	12	13	3386
TRAFFIC OFFS																							
M	0	0	0	0	0	0	29	2166	5415	8664	11913	15162	11963	38340	34481	17397	8415	6525	3584	2283	1389	1234	168960
F	0	0	0	0	0	0	0	284	569	853	1137	1421	1508	5029	4253	1464	710	660	610	586	0	0	19084
T	0	0	0	0	0	0	29	2450	5984	9517	13050	16583	13471	43369	38734	18861	9125	7185	4194	2869	1389	1234	188044
TOTAL																							
M	22	126	258	443	708	1196	2106	4470	8240	10796	14678	17727	13913	43160	38500	20063	10472	7981	4712	3099	1845	1891	206406
F	0	25	36	97	188	445	669	932	1150	1193	1558	1901	1930	6379	5573	2422	1404	1300	1018	986	277	251	29734
T	22	151	294	540	896	1641	2775	5402	9390	11989	16236	19628	15843	49539	44073	22485	11876	9281	5730	4085	2122	2142	236140

Number of Persons by Most Serious Offence and Disposition - Victoria 2000

	JUVENILE JUSTICE	FINE	PROBN.	ATT.CR /CSO.	BOND, RECOG	PRISON--(HEAD SENTENCES)---------- <6M	6<12M	1<2YR	2<3YR	3<4YR	4<5YR	5<10YR	>10YR	LIFE	OTHER	TOTAL
HOMICIDE	0	3	5	3	3	2	0	3	23	23	8	14	8	15	7	117
ASSAULTS	193	1620	157	85	743	337	43	23	7	3	3	0	0	0	56	3270
SEX ASSAULT	51	110	102	13	183	25	2	9	9	11	6	11	2	0	5	539
AGNST PERSON	19	13	10	0	19	4	6	7	37	14	14	21	0	0	1	165
ROBBERY ETC	11	14	91	20	41	6	0	20	18	18	14	34	7	0	1	295
BURGLARY	2185	506	566	174	665	357	194	99	10	5	5	0	0	0	194	4960
FRAUD ETC	238	931	186	14	712	183	48	24	2	7	2	0	0	0	33	2380
RECEIVING	239	594	132	48	311	114	30	11	3	2	2	0	0	0	15	1501
OTHER THEFT	6667	5181	761	254	4131	580	163	72	0	0	0	0	0	0	308	18117
PROP. DAMAGE	505	1042	162	33	310	57	6	12	4	2	2	0	0	0	10	2145
GOVT/JUSTICE	121	652	16	12	141	143	12	2	1	0	0	0	0	0	71	1171
PROSTITUTION	2	1692	19	0	50	95	4	2	0	0	0	0	0	0	2	1866
OFF. BEHAV'R	99	2945	11	4	338	106	11	0	0	0	0	0	0	0	11	3525
POSS WEAPONS	201	982	11	1	160	40	4	6	3	1	0	0	0	0	1	1410
GOOD ORDER	603	2066	65	14	487	117	17	14	7	3	3	0	0	0	31	3427
DRUG OFFENCE	34	2008	115	10	809	132	54	14	71	41	41	27	3	14	10	3383
TRAFFIC OFFS	4776	176197	263	226	3949	2068	564	0	0	0	0	0	0	0	0	188043
TOTAL	15944	196556	2672	911	13052	4366	1158	318	195	130	100	107	20	29	756	236314

Number of Prisoners Received During the Year and Prisoners on Hand at End of Year by Time Remaining to Serve - Victoria 1982-2000

YEAR	<1YR	1<2YR	2<3YR	3<4YR	4<5YR	5<6YR	6<7YR	7<8YR	8<9YR	9<10Y	10<11	11<12	12<13	13<14	14<15	15<16	16<17	17<18	18<19	19&+Y	TOTAL
PRISONERS RECEIVED:																					
1982	841	471	144	78	40	33	26	21	15	13	11	5	0	6	15	16	10	4	4	0	1753
1983	5651	344	97	60	29	12	8	6	3	4	4	2	2	1	4	6	6	5	5	3	6252
1984	5721	347	98	61	29	12	8	6	3	4	4	2	2	1	4	6	6	5	5	3	6327
1985	5765	350	99	62	29	12	8	6	3	4	4	2	2	1	4	6	6	5	5	3	6376
1986	5827	353	100	62	30	12	8	6	3	4	4	2	2	1	4	6	6	5	5	3	6443
1987	5869	358	101	63	31	12	8	6	3	4	4	2	2	1	4	6	6	5	5	3	6493
1988	5895	360	101	63	31	12	8	6	3	4	4	2	2	1	4	6	6	5	5	3	6521
1989	5912	362	102	64	31	13	8	6	3	4	4	2	2	1	4	7	7	6	6	3	6547
1990	5935	364	103	64	31	13	8	6	3	4	4	2	2	1	4	7	7	6	6	3	6573
1991	5954	364	103	64	31	13	8	6	3	4	4	2	2	1	4	7	7	6	6	3	6592
1992	5972	364	103	64	31	13	8	6	3	4	4	2	2	1	4	7	7	6	6	3	6610
1993	5996	364	104	65	31	13	8	6	3	4	4	2	2	1	4	7	7	6	6	3	6636
1994	6016	367	104	65	31	13	8	6	3	4	4	2	2	1	4	7	7	6	6	3	6659
1995	6037	367	104	65	31	13	9	6	3	4	4	2	2	1	4	7	7	6	6	3	6681
1996	6063	370	104	65	31	13	9	6	3	4	4	2	2	1	4	7	7	6	6	3	6710
1997	6096	370	104	65	31	13	9	6	3	4	4	2	2	1	4	7	7	6	6	3	6743
1998	6117	371	104	65	31	13	9	6	3	4	4	2	2	1	4	7	7	6	6	3	6765
1999	6139	371	104	65	31	13	9	6	3	4	4	2	2	1	4	7	7	6	6	3	6787
2000	6167	372	105	65	31	13	9	6	3	4	4	2	2	1	4	7	7	6	6	3	6817
PRISONERS ON HAND:																					
1982	841	471	144	78	40	33	26	21	15	13	11	5	0	6	15	16	10	4	4	0	1753
1983	927	466	162	98	60	36	27	20	15	13	7	4	11	16	18	14	10	8	5	3	1920
1984	937	488	183	113	62	37	26	20	14	10	10	15	19	18	17	15	13	9	7	3	2016
1985	963	510	195	116	62	36	26	19	13	16	20	21	20	17	18	18	14	11	7	3	2105
1986	988	522	198	115	63	36	25	20	20	24	25	21	19	19	21	19	16	11	7	3	2172
1987	1001	528	199	117	63	35	28	27	27	28	24	21	22	21	22	20	16	11	7	3	2220
1988	1008	532	200	117	64	40	35	33	30	27	25	24	23	22	23	20	16	11	7	3	2260
1989	1012	534	201	120	69	47	40	35	29	29	28	25	24	23	23	21	17	12	8	3	2300
1990	1016	538	206	126	76	51	41	35	32	31	29	26	25	23	24	22	18	12	8	3	2342
1991	1023	543	212	132	79	52	42	38	33	32	30	26	25	24	25	23	18	12	8	3	2380
1992	1030	549	217	134	80	54	44	39	34	33	30	27	26	25	25	23	18	12	8	3	2411
1993	1038	553	220	136	82	55	45	40	35	33	31	28	27	25	25	23	18	12	8	3	2437
1994	1044	559	222	138	83	56	46	40	35	34	32	28	27	25	25	23	18	12	8	3	2458
1995	1050	561	224	139	84	57	47	41	36	35	32	28	27	25	25	23	18	12	8	3	2475
1996	1055	566	225	140	85	58	48	42	37	35	32	28	27	25	25	23	18	12	8	3	2492
1997	1062	567	226	141	86	59	49	42	37	35	32	28	27	25	25	23	18	12	8	3	2505
1998	1065	569	227	142	87	60	49	42	37	35	32	28	27	25	25	23	18	12	8	3	2514
1999	1069	570	228	143	87	60	49	42	37	35	32	28	27	25	25	23	18	12	8	3	2521
2000	1073	572	229	143	87	60	49	42	37	35	32	28	27	25	25	23	18	12	8	3	2528

Summary of Probationers Received During the Year and On Hand at End of Year - Victoria 1982-2000

TIME REMAINING:						
YEAR	<1YR	1<2YR	2<3YR	3<4YR	4<5YR	TOTAL
PROBATIONERS RECEIVED:						
1982	2410	1634	436	66	25	4572
1983	767	1224	373	41	25	2430
1984	773	1235	376	41	25	2450
1985	780	1245	378	42	27	2472
1986	786	1256	383	42	27	2494
1987	790	1261	385	43	27	2506
1988	792	1264	387	43	27	2513
1989	790	1262	386	43	27	2508
1990	795	1264	386	43	27	2515
1991	799	1270	388	43	27	2527
1992	802	1277	390	43	27	2539
1993	808	1288	393	43	27	2559
1994	813	1294	393	43	28	2571
1995	818	1301	395	43	28	2585
1996	824	1313	398	43	28	2606
1997	830	1322	400	43	28	2623
1998	834	1330	402	43	28	2637
1999	841	1337	403	44	29	2654
2000	846	1347	407	44	29	2673
PROBATIONERS ON HAND:						
1982	2410	1634	436	66	25	4572
1983	2401	1660	439	66	25	4591
1984	2433	1674	442	66	25	4640
1985	2454	1687	444	67	27	4679
1986	2473	1700	450	69	27	4719
1987	2490	1711	454	70	27	4752
1988	2503	1718	457	70	27	4775
1989	2508	1719	456	70	27	4780
1990	2514	1720	456	70	27	4787
1991	2519	1726	458	70	27	4800
1992	2528	1735	460	70	27	4820
1993	2543	1748	463	70	27	4851
1994	2561	1757	463	70	28	4879
1995	2575	1764	465	71	28	4903
1996	2588	1778	469	71	28	4934
1997	2608	1791	471	71	28	4969
1998	2625	1801	473	71	28	4998
1999	2642	1810	474	72	29	5027
2000	2656	1821	479	73	29	5058

Summary of Persons Received at Attendance Centres During the Year and Persons on Hand at End of Year - Victoria 1982-2000

TIME REMAINING: YEAR	<3MS	3<6MS	6<9MS	9<12M	1<2YR	2+YRS	TOTAL
PERSONS RECEIVED:							
1982	30	88	56	55	38	3	270
1983	210	328	132	99	59	0	828
1984	214	331	133	101	59	0	838
1985	214	335	134	101	60	0	844
1986	215	336	136	101	61	0	849
1987	218	339	136	103	61	0	857
1988	219	338	136	104	61	0	858
1989	219	339	136	104	61	0	859
1990	219	340	136	104	61	0	860
1991	219	342	137	104	61	0	863
1992	221	342	137	105	61	0	866
1993	221	344	137	105	61	0	868
1994	223	348	139	106	62	0	878
1995	225	349	140	107	62	0	883
1996	226	351	141	107	62	0	887
1997	228	352	142	108	62	0	892
1998	229	355	143	108	62	0	897
1999	229	357	143	109	62	0	900
2000	231	359	144	109	63	0	906
PERSONS ON HAND:							
1982	30	88	56	55	38	3	270
1983	202	151	70	38	55	1	517
1984	209	155	73	40	58	0	535
1985	211	157	73	40	59	0	540
1986	212	158	74	40	60	0	544
1987	214	160	75	41	61	0	551
1988	215	160	75	41	61	0	552
1989	215	160	75	41	61	0	552
1990	215	160	75	41	61	0	552
1991	216	161	76	41	61	0	555
1992	217	161	76	42	61	0	557
1993	217	162	76	42	61	0	558
1994	219	164	77	42	62	0	564
1995	221	165	77	42	62	0	567
1996	222	165	78	42	62	0	569
1997	223	166	78	43	62	0	572
1998	224	167	78	43	62	0	574
1999	225	168	79	43	62	0	577
2000	226	169	79	43	63	0	580

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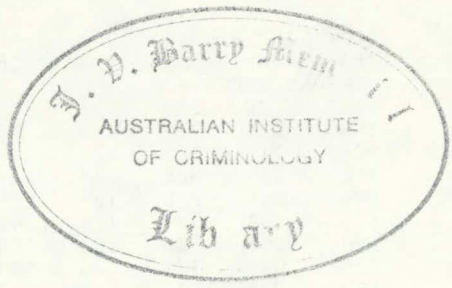

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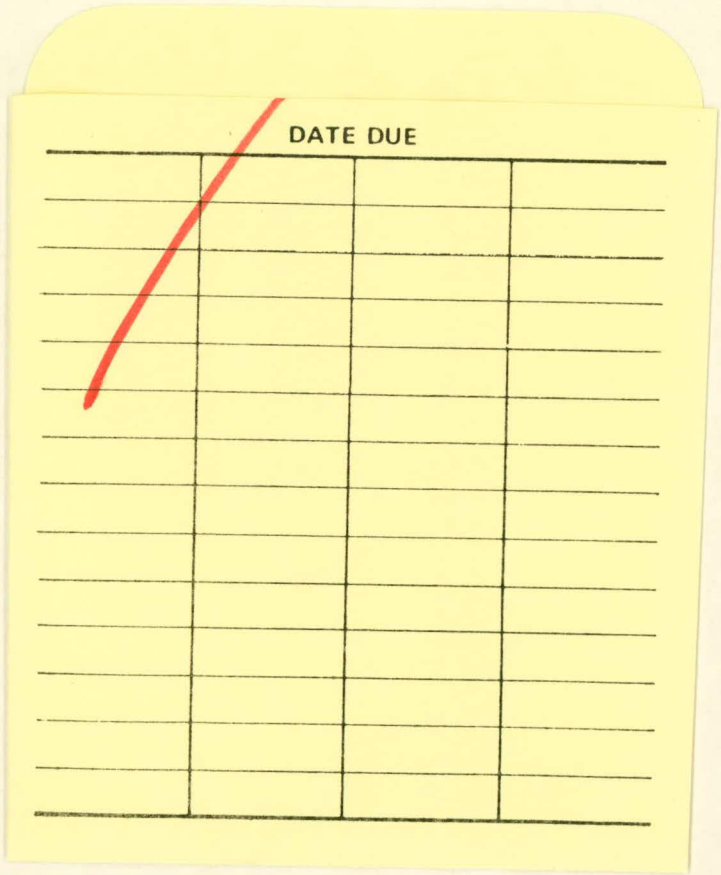
Forecasting prisoner numbers



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