

ED 027 553

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Manpower Guidelines for Educational Policy Planning in the State of California.

California State Committee on Public Education, Berkeley.

Spons Agency-Office of Education (DHEW), Washington, D.C.

Pub Date Feb 68

Note-80p.

EDRS Price MF-\$0.50 HC-\$4.10

Descriptors-Job Training, *Manpower Development, *Manpower Utilization, Occupational Guidance, *Vocational Adjustment, Vocational Development, *Vocational Education, Vocational Schools, Vocational Training Centers

Identifiers-California

This report provides guidelines for educational policy based on an analysis of current and projected manpower development in the state of California. The major findings and recommendations are: (1) A specific agency must be developed to recommend to the state government long-range policies for manpower development and education. (2) The secondary school system must be improved and the junior colleges should provide remedial and general education programs as well as more work-oriented education. (3) The state must become more self-sufficient in providing its own manpower and work-oriented education at the high school level should be of a general nature. (4) A greater emphasis must be placed on vocational and technical education in public schools along with closer cooperation with other agencies involved in manpower training. (5) The United States as well as California must improve and/or develop a system to facilitate the synchronization of occupational education-training objectives. (6) Studies must be made to determine which formulas for distribution of state financial aid are to be made to equalize the success and achievements rate and to develop equitable base for occupation-oriented education. (Author/GG)

ED 027 355

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MANPOWER GUIDELINES FOR EDUCATIONAL POLICY PLANNING
IN THE STATE OF CALIFORNIA

Consultant's Report Prepared
For the State Committee on Public Education

by

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February, 1968

(Financed from federal funds made available under
Title V Elementary and Secondary Education Act,
Public Law 89-10.)

CG 002 955

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MANPOWER GUIDELINES FOR EDUCATIONAL POLICY PLANNING
IN THE STATE OF CALIFORNIA

Nicholas DeWitt

Summary Findings and Recommendations

This study is intended to provide some guidelines for educational policy based on the analysis of current and projected manpower development in the State of California. The major findings and recommendations are:

Finding I. The State of California and its agencies do not conduct systematic studies of manpower requirements as related to education. An inter-agency board for human resources development composed of representative departments ought to be established to deal with long-range manpower development problems (research on manpower development policy in relation to all levels of education) on a systematic and coordinated basis. The present California Manpower Coordinating Committee does not fulfill such a function. Such activities should be funded through appropriations for research and planning to specific agencies, as well as to the coordinating board itself, which would be the major statutory agency recommending to the executive and legislative branches of the State long-range policies for manpower development and education.

Finding II. The data examined below indicate that the real bot-

tleneck in the development of universal public education in the State of California is the high dropout rate in grades 10-11 and 11-12. Some 20 per cent of the pertinent age group do not complete 12 years of schooling in California and thus enter the labor market without any significant preparation for work-oriented activity or employment in an occupation. Of those who do graduate from the 12th grade, at least 35 per cent do not continue on to any system of higher education (including junior colleges). Solutions must be sought for the following:

- (1) The effectiveness of upper secondary education must be improved.
- (2) Improved remedial and continuing education with emphasis on job skills should be conducted not under the auspices of the public secondary schools but under the auspices of the junior colleges, combining work-oriented (vocational) education and remedial general education equivalent to grades 10-12.
- (3) In view of the fact that 55 per cent of California youth do not continue on to higher education of any kind, the secondary schools (with increased and improved guidance and counseling) should singly or in combination with junior colleges offer more work-oriented or occupational education.
- (4) Such work-oriented or occupational education (note: the present types of so-called "vocational education" courses must be completely overhauled and fitted into new program requirements identified by occupational clusters) should be offered to all secondary school students, even though they purport to be enrolled in college preparatory programs, either through new centers or in collaboration with junior college programs.

Finding III. In the past the State of California has been dependent to a large extent upon the immigration of high-level manpower (with 12 or more years of education) from other states. Such dependence will be diminishing somewhat in the next two decades, but will

not be totally eliminated in the foreseeable future. In its public education, however, the State should adopt a policy of "self-sufficiency" which reinforces the suggestions in Finding II above. The occupational shifts in the next decades will be such that the greatest demand will be in white-collar and service occupations. This must be reflected in the guidance and counseling in secondary schools, with the assumption that in the next two or three decades the upcoming age groups will be composed of:

50 per cent high-school graduates (or less than completion of 12 grades)

25 per cent with partial higher education

25 per cent with completed higher and post-higher education.

Strictly speaking, the college preparatory programs should concern only about one-half of secondary school students, who nevertheless should be exposed to some occupation-oriented school training. The other half must receive more extensive work-oriented or occupation-oriented education in the high schools. In view of the anticipated inter-occupational shifts, such work-oriented education should be of a general rather than narrow specific job-oriented type. Broad occupational preparation profiles and training requirements must be developed in a cooperative effort between secondary schools, junior colleges and employers.

Finding IV. Statistics on vocational education and data on manpower retraining are inadequate to judge the extent of work-oriented or employment-oriented training in California schools. In 1965-66 some 225,000 students in secondary schools and 156,000 in junior col-

leges took at least one vocational course. How many students took more than one such course is difficult to judge. Manpower retraining (most of it under federal programs) was offered to some 52,000 persons. It appears that in the aggregate, less than one-fourth of all secondary students took at least one vocational course, and if the same student took more than one course, the proportion would be much smaller. The entire program of work-oriented education in the secondary schools of the state must be re-examined. The State of California needs new emphasis on vocational and technical education in public schools and outside them. The State cannot afford the competition, proliferation and duplication of effort. The main problem is how to develop close cooperation between the State Department of Education and other outlets currently involved in manpower training and retraining activities.

Finding V. Manpower planners examine and forecast certain employment demand and occupational trends but usually shy away from associating these with specific educational and training requirements. Educationalists are invariably willing to examine the effectiveness of teaching-learning processes, but seldom if ever are willing to consider and be constrained by the requirements of the occupational end-use of their products. The problem, then, both for the United States nationally and for the State of California, is how to improve and/or develop a system or a set of sub-systems which would facilitate the synchronization of occupational requirements and occupational education-training objectives. Occupational guidance, as well as occupational preparation, should be most radically revised and improved in the light of employment requirements. California should develop a

state-wide computer system utility which would permit more effective synchronization of occupational guidance (education-training) with actual employment opportunities. This system should be administered by an independent board (such as is recommended in Finding I above), but its services should be made available to all school districts either through a Department of Education subsidy or on a subscription basis.

Finding VI. Without a thorough study of motivational patterns for the state, such as relationships of income-educational attainment, income-educational aspirations, income-school completion (and further post-secondary education)--all controlled for occupation of parents, urban-rural patterns and inner-city-suburban breakdowns--the analysis of the effectiveness of ADA expenditures by county or district, related to transitional coefficients (school success) or other achievement variables, makes little sense. The data by county aggregated by regions, in relation to transitional coefficients (grades 10-11 and 11-12) and continuation into post-secondary education, display significant variation for the state. If it is assumed that the quality of education, as judged by success rates (and further post-secondary education), is a variable of expenditures per pupil, it varies significantly throughout the state. The enormous variation of expenditures for occupation-oriented education by county and school district is clearly evident from financial reporting of the state. Studies must be made to determine what formulas for distributing state financial aid are to be made to equalize the success and achievements rate and particularly to develop an equitable base for occupation-oriented ed-

ucation. However, it is emphatically clear that the present formulas of redistribution of state aid funds in order to provide for equitable educational opportunities (measured by the success rates of students and/or achievement) and for occupation-oriented education simply make no sense.

General Considerations

Under the conditions of political uncertainty and accelerated technological and social change which are taking place in America today, the business of economic and social forecasting is one of the most difficult undertakings. It is doubly difficult to translate economic or "social goal" forecasts into employment and occupational requirements of the future. It is then triply difficult to interpret these manpower projections in terms of the associated educational and training prerequisites.

This paper deals with aggregate indicators of these future trends. Some planning decisions are basically simple: aspirin will usually cure a headache, though not all headaches at all times. Others are very complex: spending more money on education will usually produce in a formal sense more educated men, though not all better educated under the same circumstances--and not all better equipped to perform their functional roles in society. The acceptance of planning depends upon the degree of complexity and certainty of the projections on which the decisions are based. Some decisions do not involve knowledge about how the entire system works; others need the conception of the oper-

ation of the whole process. The effectiveness of the planning process depends upon the degree of certainty in projecting the future influences of a few key and relatively well understood elements. It is the proper knowledge of these major elements which establishes the functional framework for planning, and the planning process as a tool for policy decisions becomes difficult to manage if it is cluttered by cumbersome detailed information.

Unlike most manpower studies of a similar type,¹ based on a collective effort, extensive computerized data-processing and cooperative arrangements with a multiplicity of state agencies, the present report constitutes an individual effort. As such, it derives its shortcomings not only from the paucity of data generated by state agencies, but also from the lack of funds to develop a much more detailed and refined "in depth" study of occupational requirements. As noted in the author's earlier report to the Joint (Legislative) Committee on Higher Education,² the State of California is especially in need of such manpower studies, for it is unique among other states in its pattern of net migration and dependence of employment upon federal (defense-aerospace) procurement policies.

Planning decisions, especially those taken by public bodies and government, must necessarily involve conception about the operation and functioning of education in relationship to specific activities and goals of the society it serves. It is the interaction of aims and social forces outside education that makes educational planning the most complex of all societal institutions. "Education for what" represents a major dilemma, and depending upon judgment and values, only certain aspects of

educational planning are usually selected for emphasis. There are many shades of judgment about the relevance of education to the development of society, but basically the attitudes towards educational planning may be grouped into three categories:

- (1) Assuming that education is a human right and an individual good in itself, the main concern of educational planning should be the "quantity of output"--provision of maximum opportunities and unlimited choices for individuals regardless of how and why they seek or use such education.
- (2) Assuming that education is a tool for developing leadership talent of society, the main aim of educational planning should be the "quality of output"--selection of individuals according to some prescribed standards and education to the maximum capacity of only those who can benefit from it.
- (3) Assuming that education is a means for the development of differential and specialized human inputs into the productive processes of society, the main task of educational planning is to establish criteria for "quantity and quality outputs" in accordance with social needs for the "division of labor" and "productive employment."

In the past few years various inquiries into state policies and legislation by different committees and commissions have developed the viewpoint that one of the greatest assets of California lies in the richness of its human resources. In view of this, it is peculiar to note that neither spokesmen for the Great Society in the past nor advocates of the Creative Society now have addressed themselves to the development of long-run policies to enhance the manpower potential of the state. A review of the reporting and data-gathering activities of the State Departments of Industrial Relations, Employment, Education, etc., reveals that their main preoccupation is with current information and no forward projections and planning are undertaken, with the notable exception of demographic projections by the Department of Finance.

One of the universal concepts of development is the division of labor, which refers to the fact that the labor performed in a society is diversified and specialized, and that the process of development calls for greater diversification of the skills of labor and more complex interdependence in the utilization of manpower. It is in this area that exercises (research and policy planning) in the State of California fall far short of their potential. In order to conduct such exercises, occupational-educational requirements must be studied on a continuing basis, an activity neglected by the state agencies.

One of the major objectives of my assignment was to prepare estimates on manpower needs of the California economy and to define the effectiveness of the public schools in meeting these needs. The major difficulty in carrying out this exercise rests not only with the lack of readily available data generated by state agencies which are supposed to deal with past, present and "future" statistical information, but with the very hazards of projecting trends under conditions of accelerated change which are taking place currently in employment and occupational requirements and the associated educational and training prerequisites. Undoubtedly, economic conditions will affect employment. Nevertheless, under certain assumptions it is more preferable to devise certain broad guidelines for the future designed to clarify major goals and aggregate targets rather than extrapolate exact magnitudes of the future population and employment and associated occupational and educational requirements.

Manpower and Education

As a nation, we are probably more concerned at present with the relationship between our educational system and employment than ever before. This concern has been expressed on many occasions,³ and was most recently dramatized in two of President Johnson's Messages to Congress.⁴ In order to introduce the subject, yet avoiding the construction of a complicated model, Chart I has been prepared. It gives a schematic representation of the relationships between education, population and labor force. Complex arguments and the methodologies of manpower projections aside, it is sufficient to state that the educational system has its "natural" inputs, both in-state born and in-migrant population, and its outputs. Two kinds of outputs are produced:

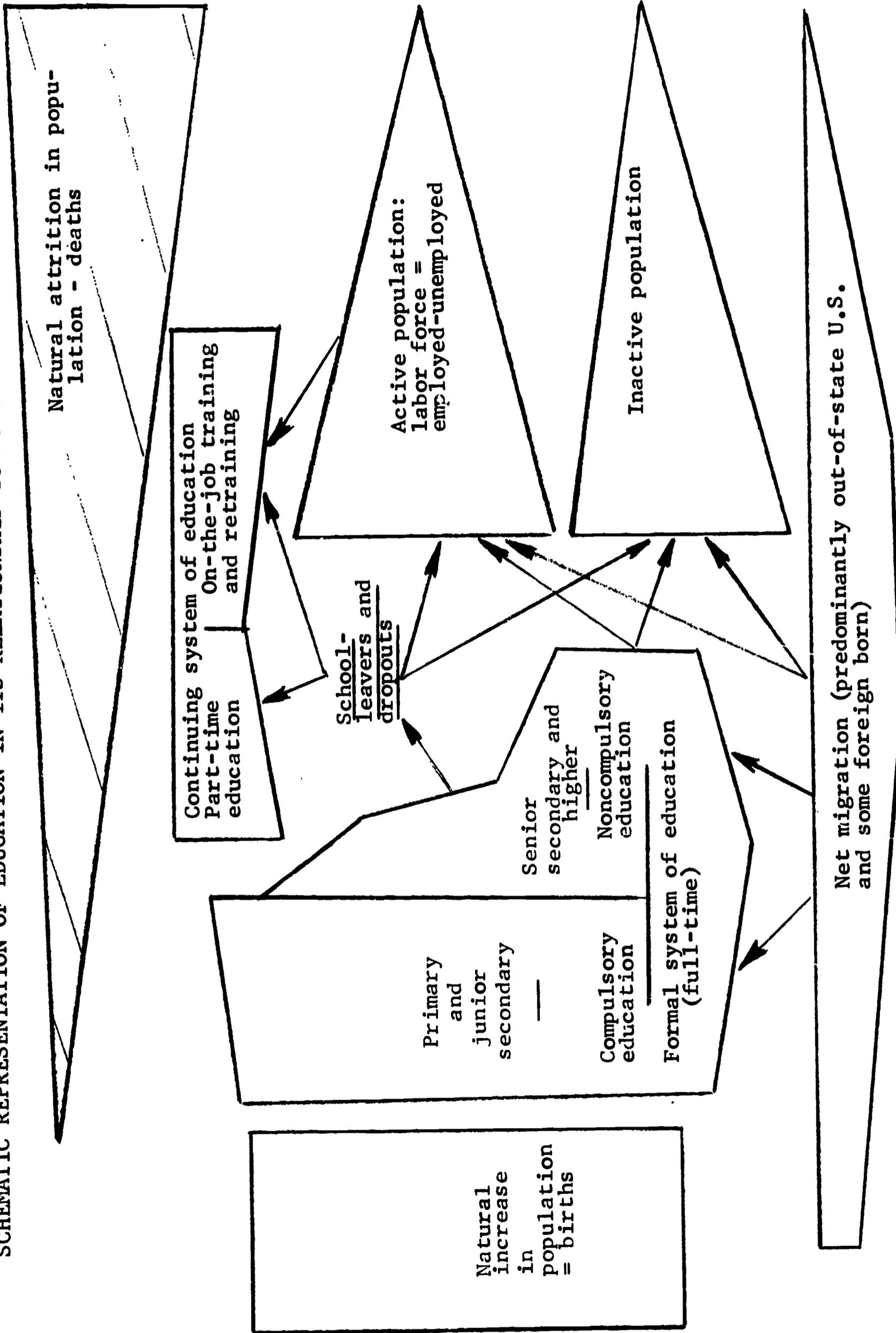
- (1) Graduates and school leavers who complete their program of education
- (2) Persons who, for lack of a better word, are called "drop-outs"--persons who do not complete the program of education which they began.

These two products of the educational system are then either absorbed in the active population and labor force or else become part of the inactive population. Both graduates and school leavers who entered the active labor force or who became part of the inactive population may at some time enroll in programs of continuing education which are administered either as an adjunct of the formal school system (namely, part-time education) or may be trained or retrained through informal on-the-job programs.

The essence of the manpower approach to educational planning consists in reviewing occupational composition by level of educational at-

Chart I

SCHMATIC REPRESENTATION OF EDUCATION IN ITS RELATIONSHIP TO POPULATION AND LABOR FORCE



tainment of the active population and then stating that certain levels of educational preparation are "required" or desired. U.S. social policies and the U.S. educational system are such as to make the prediction of educational requirements based on manpower needs more difficult and less accurate than is the case in other social systems. No manpower planning techniques attempted so far have achieved predictions of sufficient accuracy in the long run to serve as precise guides for educational policy. Conversely, no educational development efforts attempted so far have achieved the functional training objectives of preparing human beings for specific work-oriented roles in society. Given these truisms and, particularly, considering the realities of the U.S. social and political setting, which reflect flexibility and pluralism, all that can be hoped to be accomplished by the manpower approach to educational planning is to identify correctly and approximately the trends and the direction of the effort needed.

National trends appear to be as follows.⁵ The United States has already achieved nearly universal education up to age 15. The social policy is to push this up. At the present time, approximately 65 per cent of the population aged 15-24 enter the labor force as "school leavers" with education of from 9 to 14 years. Even if in the next two decades this proportion is reduced to some 45 per cent of the age group 15-24, the problem of the kind of work-oriented formal or informal training or retraining programs for employment will still remain. However, since the absolute number of persons in this age group is to increase from 27,000,000 in 1960 to 45,000,000 in 1975 and 55,000,000 by 1990, the problem of work-oriented training or retraining will be-

come more complex. If we assume that through encouragement and expansion of opportunities, 55 per cent of the age group 15-24 will remain in school in the 1970's and 1980's, the response to their educational choices will be made primarily by institutions of higher education. This leaves at least 45 per cent of the age group who would require some sort of work-oriented education of less-than-college level type.

In-Migration and California Schools

The State of California was and will remain among the top ten states in the nation affected by high rates of in-migration. The complexity of the California situation as a high net-migration state is reflected in the educational system. The entire system of formal education, as well as entry into the active labor force or inactive population, is influenced by the presence of an enormous number of net migrants. While the problem itself is widely known, the magnitude of its impact upon schools is seldom realized. According to the 1960 Census of Population, 52 per cent of the 14,400,000 California residents were born outside the State of California.⁶

In relation to the problem of public education policy, however, the following estimates should be considered:

California state births, 1949.....	245,000
Natural losses, 1949-65.....	17,000
Native age group of 17-year-olds, 1966.....	227,000
Actual age group of 17-year-olds, 1966.....	320,000
Net migration gain.....	93,000
In per cent of the age group of 17-year-olds, 1966.....	29 per cent

There is some variation in absolute numbers for neighboring years. However, the following general statement is correct: California schools in the 1950's and 1960's were educating somewhere between one-quarter and one-third of school-age children born outside the State of California.

There is wide disagreement in Sacramento, as well as among different researchers, as to what extent the net migration pattern which prevailed in the 20 post-World War II years will continue. Some feel that the present level of net migration, which accounts for an influx of some 325,000 to 350,000 persons annually (of whom some 25 per cent are youths in the school-age bracket), may decline to about 250,000 per annum in the 1970's. This may or may not happen. But even if it holds true for the 1970's and 1980's, the policy issue concerning public education will remain. The educational system must absorb out-of-state migrants and provide retraining for out-of-state migrant youth. The in-migrants will certainly constitute more than 15 per cent of the respective school age group. The problem of such absorption is not studied seriously. Therefore, the Department of Education, together with other agencies, should monitor on a continuing basis the measures for educating this youth.

Quantitative Indices of Performance of California Schools

The aforementioned issue of the influx of migrants into the school system complicates enormously any and all calculations concerning the success rates of students in California public schools. Table 1 pre-

Table 1

**GRADE TRANSITION (OR PROGRESSION-SURVIVAL) RATIOS FOR THE GRADED PUBLIC SCHOOL ENROLLMENT
OF THE STATE OF CALIFORNIA, 1947-1967**

		Entry Classes in Grade 1 in the Fall of the Year Below										
		<u>1946</u>	<u>1947</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>	
Thous.		155.3	161.7	180.9	185.7	185.3	188.3	223.9	221.7	243.3	254.0	
Transition between grades												
1-2		0.893	0.903	0.910	0.918	0.949	0.951	0.960	0.982	0.988	0.993	
2-3		0.981	0.977	0.985	1.011	1.007	1.009	0.999	1.023	1.017	1.010	
3-4		0.981	0.986	1.006	1.011	1.012	0.999	1.006	1.023	1.011	0.997	
4-5		0.952	1.015	1.016	1.017	1.004	1.014	1.018	1.019	1.007	1.017	
5-6		1.019	1.020	1.015	1.006	1.015	1.019	1.013	1.009	1.016	1.013	
6-7		1.036	1.039	1.029	1.035	1.041	1.036	1.024	1.042	1.035	1.031	
7-8		1.016	1.007	1.018	1.021	1.015	1.007	1.015	1.014	1.012	1.012	
8-9		1.026	1.030	1.032	1.034	1.027	1.036	1.035	1.038	1.040	1.043	
9-10		0.993	0.996	1.002	0.995	1.003	1.004	1.001	1.007	1.005	1.006	
10-11		0.901	0.920	0.926	0.928	0.927	0.933	0.945	0.947	0.947	0.954	
11-12		0.882	0.876	0.886	0.886	0.897	0.907	0.918	0.918	0.927	0.916	
12-grad.		1.001	0.989	0.997	1.006	1.009	1.009	1.004	1.009	0.999	(NA)	
		<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	
Thous.		114.1	124.6	148.9	160.5	167.1	172.7	208.7	227.6	242.7	(NA)	

Graduates from Grade 12 in the Spring of the Year Above

NA-- Not officially available. 1967 graduates were approximately 250,000-252,000.

SOURCE: Enrollment by grade from the reports of California State Department of Education, Bureau of Educational Research. Published reports for 1963, 1964, 1965 and 1966. Mimeographed tabulations (courtesy of Dr. H. W. Magnuson) for earlier years. Transitional coefficients recomputed on the basis of unpublished tabulations (courtesy of Mr. J. Freitas) prepared by the California Department of Finance, Financial and Population Research Section.

sents calculations of transition ratios for the graded public school enrollment in the State for the period 1947-67.⁷ On the basis of these data in Table 1, Table 2 presents the 10-year trend in transition coefficients for the California public school system. To be noted particularly are the transition ratios between Grades 6 and 7 and between Grades 8 and 9, where, because of the extremely high influx of migrants and/or because of the 'dumping effects' of parochial schools, there are 3 1/2 per cent increases in the number of pupils in the next higher grade as compared with the previous one a year earlier.

The second observation concerning Table 1 and its summary in Table 2 is the significant falling off of the transition ratios between Grades 10 and 11 and 11 and 12. Based on the transitional coefficients, which already incorporate the additions of out-of-state migrants, thus inflating the base totals, there is still a dropout rate of about 7 per cent between grades 10 and 11 and of about 10 per cent between Grades 11 and 12. The data in Table 1 indicate that there has been some improvement in the success rates of these grades over the last ten years, but still a substantial dropout rate in these grades continues to exist.

Parenthetically, the status of data-gathering concerning parochial school enrollment is most unsatisfactory. The only agency which compiles such information on a state- and county-wide basis is the California Taxpayers' Association. It is clear, however, that in the realm of primary-secondary education, parochial schools account for 10 per cent of enrollment (with the notable exception of the Los Angeles area,

Table 2

**AVERAGE TRANSITION COEFFICIENT BETWEEN GRADES IN THE PUBLIC
SCHOOLS OF CALIFORNIA**
(based on 10-year trend [1946-55 for entering
classes and 1958-67 for graduates])

Grade	Transition coefficient
1-2	.945
2-3	1.011
3-4	1.003
4-5	1.008
5-6	1.014
6-7	1.035
7-8	1.014
8-9	1.034
9-10	1.001
10-11	.933
11-12	.901
12-grad.	1.002

SOURCE: The state-wide averages are based on 10-year mean transition coefficients presented in Table 1 above.

where they account for a much higher percentage). In 1967 legislation was passed requiring parochial schools to report certain enrollment and financial data to the California State Department of Education. This is a step forward, but the problem of "transfers" from the parochial system to the public system, particularly in the transitional grades (6 to 7 and 8 to 9), should be a subject of specific study.

School-Age Population and Enrollment

Table 3 presents data on school-age population and graded enrollments, both in the public and parochial schools of the State of California for 1966. The public and private schools of California enroll 98.2 per cent of the pertinent age group in primary and 92.3 per cent in secondary education. If we were to exclude parochial school enrollment, the population-school enrollment ratios for public schools were only 89.1 per cent for grades 1-8 (ages 6-13) and 86.0 per cent for grades 9-12 (ages 14-17). Up to grade 9, some 98 per cent of the school-age population is in school, but there is a sharp decline in grades 11 and 12, of 10 and 15 per cent respectively. These aggregate ratios include enrollments in parochial schools. In 1966 4 per cent, 10 per cent and 15 per cent of grade level 10, 11, and 12 respectively were not enrolled in the high schools of the state.

What are the policy implications? Either because of the lack of motivation or because of the inadequacies of the schooling, the high dropout rate persists. The schools do not supply youths with the kind of education that will enable them to participate in work-oriented ac-

Table 3
 SCHOOL-AGE POPULATION IN RELATION TO GRADED ENROLLMENTS IN PUBLIC AND PAROCHIAL SCHOOLS
 IN THE STATE OF CALIFORNIA, 1966

Age	A Population July 1966		B Graded Enrollment		C Parochial schools Oct. 1966	Total	Per cent of age group in grade
	Grade		Public Schools Sept. 1966				
5	402,000	K	373,600	7,200	380,800	94.7	
6	399,000	1	375,400	41,900	418,400	104.8	
7	396,000	2	352,200	41,100	393,300	99.3	
8	398,000	3	342,500	40,500	383,000	96.2	
9	392,000	4	342,700	39,900	382,600	97.6	
10	386,000	5	334,600	38,700	373,300	96.7	
11	370,000	6	322,200	37,000	359,200	97.1	
12	365,000	7	326,500	35,400	361,900	99.1	
13	355,000	8	316,400	33,300	349,700	98.5	
6-13	3,463,000	1-8	3,087,200	315,000	3,402,200	98.2	
14	347,000	9	316,800	24,600	341,400	98.4	
15	338,000	10	304,000	21,700	325,700	96.4	
16	331,000	11	276,700	19,000	295,700	89.1	
17	318,000	12	250,400	17,700	268,100	84.3	
14-17	1,334,000	9-12	1,147,900	83,000	1,230,900	92.3	

SOURCES: A--California Dept. of Finance; Revenue and Management Agency, California

Population--1966, Sacramento, Oct. 1966, p. 13.

B--California State Dept. of Education, Enrollment in California Public Schools--
Fall 1966, Sacramento, 1967, p. 5

C--California Taxpayers' Association, "Parochial School Enrollment: California
 Counties as of September 1966," mimeo. Jan. 1967, p. 2.

tivity. It is at this point that the seed of trouble is evident. The dichotomy of work-oriented versus academic education in the high schools themselves is self-evident.

Is the high school conceived as producing a work-oriented heterogeneous student output, or is its main purpose to prepare students for post-secondary education? The problem is not merely with vocational education as conceived in the past as a kind of "arts training" for those unable to master academic programs, but rather the development of a new kind of employment-oriented training for those who will not continue in post-secondary institutions or will elect occupation-oriented training in junior colleges or similar-type institutions. It was not the task of this study to examine curricular contents. It is sufficient to point out that throughout the nation there is a widespread movement to develop new "vocational" instruction programs under a variety of names and auspices. The State of California must be fully cognizant in adopting and developing its own "comprehensive" or "organic" occupation-oriented programs.

Based on information (i.e., correlation of the population of respective age groups with actual enrollment by grade) similar to that presented in Table 3, projections of school enrollment by grade level (1-8) in primary schools and by group of grades for primary (1-8) and secondary (9-12) schools were derived by the California Revenue and Management Agency. These projections are presented in Table 4 and Table 5 respectively. The calculations were not repeated for this study, but the implied (assumed) ratios of enrollment to population are about 90 per cent for elementary public schools (excluding parochial school

Table 4

PROJECTED SCHOOL ENROLLMENT IN GRADES 1-8 IN
CALIFORNIA PUBLIC SCHOOLS, 1966-1980

Fall	Total	Grades:							
		1	2	3	4	5	6	7	8
1966	2,719,000	375,400	354,700	345,500	342,200	335,500	323,300	327,300	316,600
1967	2,793,200	384,900	364,100	354,200	344,800	344,900	338,200	332,200	330,000
1968	2,850,400	382,100	373,300	363,600	353,500	347,600	347,800	347,500	335,000
1969	2,905,800	384,300	370,700	372,800	363,100	356,500	350,600	357,400	350,500
1970	2,941,200	379,300	372,800	370,100	372,400	366,200	359,600	360,200	360,600
1971	2,958,400	370,000	367,900	372,200	370,100	375,700	369,500	369,400	363,500
1972	2,978,700	374,900	358,900	367,300	372,400	373,500	379,200	379,600	372,900
1973	3,010,300	395,000	363,700	358,300	367,700	375,900	377,000	389,600	383,200
1974	3,049,900	413,200	383,200	363,100	359,000	371,200	379,500	387,300	393,300
1975	3,092,900	427,500	400,800	382,600	363,500	362,600	374,900	389,900	391,100
1976	3,151,800	442,000	414,700	400,200	382,800	366,700	366,400	385,300	393,700
1977	3,221,800	457,000	428,700	414,000	400,200	385,800	370,400	376,500	389,100
1978	3,310,000	471,000	443,300	428,100	414,000	403,200	389,500	380,600	380,300
1979	3,420,200	484,000	456,900	442,600	428,100	417,200	406,800	400,200	384,400
1980	3,538,500	496,000	469,500	456,200	442,600	431,300	420,700	418,000	404,200

Note: Sum of parts may not equal totals because of independent rounding.

SOURCE: State of California, Dept. of Finance, Revenue and Management Agency, California Population 1966, Sacramento, Oct. 1966, p. 16.

Table 5

**REPORTED AND PROJECTED STUDENT ENROLLMENT IN
KINDERGARTEN AND GRADES 1-12 CALIFORNIA
PUBLIC SCHOOLS, 1950 to 1980**

Fall	Total	Kinder- garten	Grades 1-8	Grades 9-12
1950	1,661,051	137,153	1,150,935	372,963
1955	2,411,834	232,474	1,659,188	520,172
1960	3,304,485	310,705	2,208,536	785,244
1965	4,121,442	364,816	2,646,113	1,110,513
Projected: 1966	4,247,000	374,400	2,719,000	1,155,900
1970	4,654,700	361,300	2,941,200	1,352,200
1975	5,067,700	433,800	3,092,900	1,541,000
1980	5,615,300	500,000	3,538,500	1,576,800

Note: Sum of parts may not equal totals because of independent rounding.

SOURCE: State of California, Department of Finance, Revenue and Management Agency, California Population 1966, Sacramento, Oct. 1966, p. 15. Enrollment data, actual and projected, for intermediate years are available in this report.

enrollment) and approximately 85 per cent for secondary public schools in the late 1960's, with slight upward increases (adjustment for linear extrapolation of "trend" for improved school enrollment) in the latter years. To sum up, the estimating technique employed is based on the relationships indicated in Table 3. This raises an additional problem, however.

It is to be noted that these estimates are the only set in existence in the reports of state agencies (parenthetically, the Department of Education does not make forward projections of public school enrollments, which it should be doing under alternative assumptions). The estimates are based on projected population by age groups, which are made under assumed low rates of net migration. The crucial implication is, then, that if such low rates of net migration should not materialize in the late 1960's and throughout the 1970's, the school population will be substantially higher (by some 10 to 25 per cent if the in-migration trends of the early 1960's prevail).

Furthermore, these projections imply that parochial school enrollment will expand at the same rate as public school enrollment, thus absorbing the remaining share (i.e., 10-11 per cent of the respective age groups) in their facilities. In view of the financial strains already experienced by parochial schools, such an assumption may not be warranted, and the proportion of pupils enrolled in parochial schools may decline. In this case, the public school system may have to absorb additional students by the 1980's (anywhere between 5 to 7 per cent of the age group).

Thus, the estimates presented in Table 4 and Table 5 may well be on the minimal side. In any event, during the period 1966-80 the state system of education would have to cope with a minimum expansion of 30 per cent for all grade levels and a minimum expansion of some 50 per cent for secondary schools (grades 9-12). If the migration rates are not "optimistically low" and private school expansion is "slower" than its current absorptive share, then the needs of expanding public school facilities will be significantly higher than the rates of growth indicated above. The state will continue to experience heavy "numerical pressure" to expand its public school facilities.

Public High-School Graduates, Dropouts and Their Further Disposition

The main concern of this study is to verify the output of public secondary schools. The figures in Table 6 summarize annual graduations from grade 12 of the public schools in the State of California and present projections based on assumed graduation rates during the next three decades, relating them to the hypothetical age group of 17-year-olds. If the normal age of school entry is assumed to be 5, the graduates from the 12th grade will be 17 years old. Alternatively, if the age at entry in the first grade is between 5 and 6, graduates may be 18 at the time of graduation. In order to relate graduations to the respective age group, only one age group may be assumed as the base. In absolute numbers, if the age group of 18-year-olds is assumed as the base, it would constitute 315,000 in 1966. Similarly, for other years, the difference between age group 17 and 18 is only a few thou-

Table 6

POPULATION GROUP AGED 17 AND TWELFTH GRADE GRADUATES OF PUBLIC SCHOOLS
IN THE STATE OF CALIFORNIA, 1950-67 AND 1970-2000 PROJECTION

Year	<u>A</u> Age group of 17-year olds	<u>B</u> Public school gradu- ates from grade 12	<u>C</u> Per cent graduating
Actual:			
1950	(185,000)	74,000	(40.0)
1955	(200,000)	90,800	(45.4)
1960	227,000	148,800	65.5
1961	240,000	160,500	66.9
1962	262,000	167,100	63.4
1963	300,000	172,700	57.8
1964	307,000	208,700	68.0
1965	320,000	227,600	74.3
1966	318,000	242,800	76.4
1967	321,000	(250,000)	77.9
Projected:			
1970	386,000	308,800	80.0*
1975	448,000	367,400	82.0*
1980	472,000	399,200	85.0*
1985	488,000	413,100	85.0*
1990	558,000	502,200	90.0*
1995	630,000	586,000	93.0*
2000	682,000	634,300	93.0*

* Assumed graduation ratios
Figures in parentheses are derived estimates.

SOURCES: Col. A--State of California, Department of Finance, Revenue and Management Agency, California Population 1966, Sacramento, California, Oct. 1966; and State of California, Department of Finance, Revenue and Management Agency, California Population Projections 1965-2000, Sacramento, California, Mar. 1966.

Col. B--Graduates 1960-64 from State of California, Documents Section, California Statistical Abstract 1965, Sacramento, California, 1966, p. 159; graduates 1950, 1955, 1964-67 from unpublished tabulations of State of California, Department of Finance, Revenue and Management Agency. 1970-2000 projection of graduates is based on the assumed graduation ratios in Col. C.

Col. C--Per cent of B over A and assumed ratios based on improvement during the 1960-67 period.

Note: For convenience a single age group of 17-year-olds has been adopted as a base for the "normal" graduating age. The numerical difference between 17- and 18-year-old groups is slight, and the per cent relation of graduates to age groups in either case is about the same.

sand persons. The per cent relationship between age group and graduates would not be significantly affected if the base is changed from 17 to 18 or vice versa.

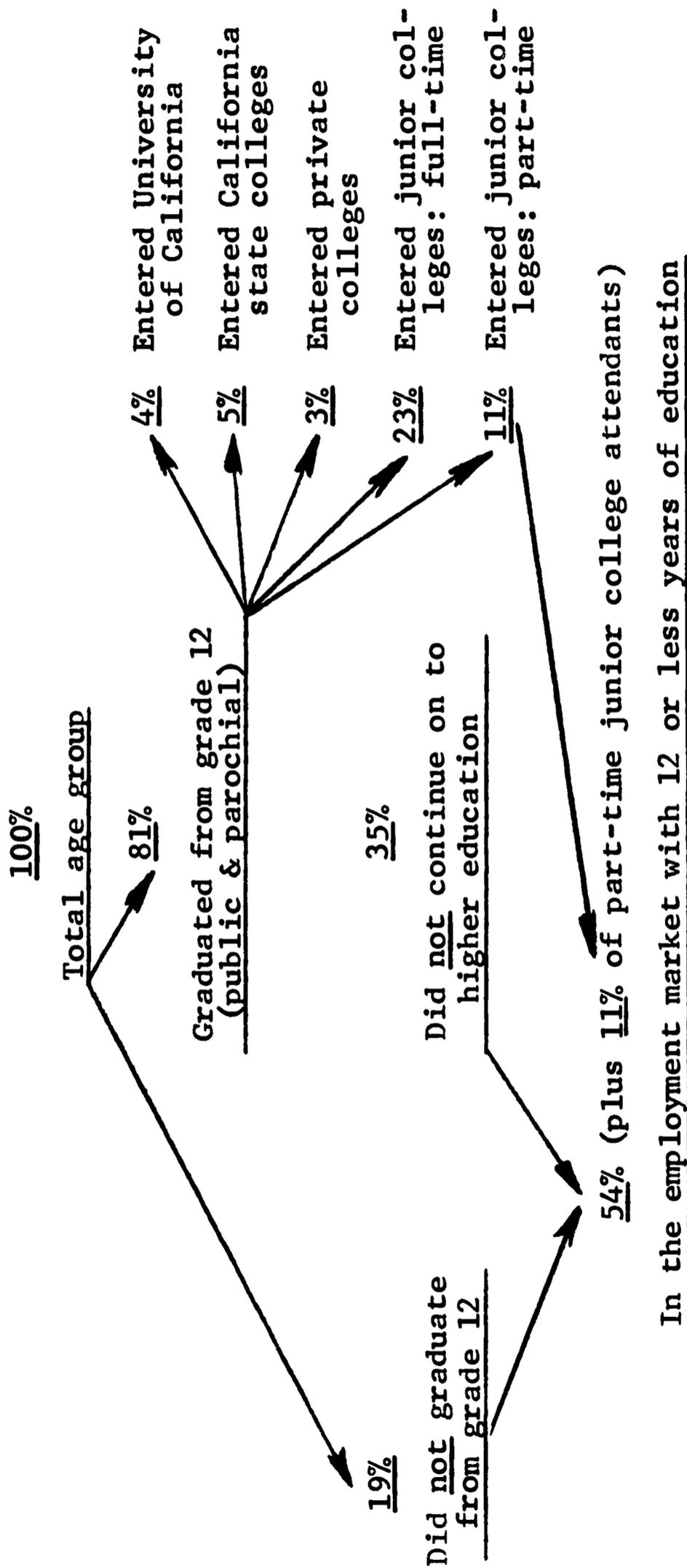
The data in Table 6 present actual graduation figures up to 1967 and extrapolations based on assumed ratios for the year 1970 and thereafter. It is the opinion of this researcher that if the goal of universal secondary education in the state is to be maintained, the burden will fall upon the public schools in the decade of the 1980's and thereafter, with the private schools accounting for a decreasing proportion of all high school graduates (i.e., this is reflected in the increase of graduates from public high schools from 82 per cent in 1975 to 90 per cent in 1990 of total age group).

It is evident that at the present time only 78 per cent of the appropriate age group graduates from public secondary schools. If we add the estimated number of graduates from private schools (in 1966 about 16,000-17,000), the proportion of the age group completing secondary education in the State would be about 81 per cent. The aforementioned relatives of graduation to population in the corresponding age group are consistent with the data discussed earlier on transitional coefficients (Table 1 and Table 2) and school enrollment-population relatives (Table 3). There is no question as to the correctness of the magnitude--approximately 20 per cent of the age group in California currently do not complete secondary education.

In order to follow up the disposition of the age group, Chart II was constructed on the basis of the graduation data above (including parochial schools) and the actual first-year acceptances in different

CHART II
 1966 DISTRIBUTION OF 17-YEAR-OLDS IN THE STATE OF CALIFORNIA
 BY EDUCATIONAL STATUS

(Total - 320,000)



Note: If the age group of 18-year-olds were to be assumed, the percentages would not alter significantly. The absolute number of 18-year-olds in 1966 was about 315,000. See also discussion in text. Actually, age at graduation from the 12th grade may range from 17 1/4 to 18 3/4 years. For statistical purposes a single age group--17-year-olds--was selected as a base.

institutions of higher learning.⁸ Of the total number of 17-year-olds in 1966, 19 per cent did not graduate from grade 12, and of those who did graduate from grade 12, 35 per cent did not continue on to any sort of post-secondary education. Thus, better than half of the entire age group either were destined to work-oriented activity or entry into the employment market. Obviously, some entered the inactive population, but the great majority were job-seekers with 12 years or less of education.

There are a number of refinements which could be considered. One of the major complications is the lack of clear-cut differentiation between full- and part-time first-time entrants to institutions of higher education. This is a very complicated problem, with good statistics available for junior colleges but only ambivalent information for the state colleges, the University of California, and private higher educational institutions. If a consistent set of figures for first-time entrants into part-time higher education could be developed, the proportion of those continuing on to higher education would be lowered. Additional refinements could also be introduced. If we consider military service withdrawals (some 20,000 in 1966 in the 18-year age group), or if we do not include private school graduates (some 16,000), then the per cent distribution indicated on flow Chart II would alter slightly. For the public school graduates only and the state system of public higher education, the 1966 ratios of access were: 43 per cent (part- and full-time) entered junior colleges; 6 per cent, the University of California; and 6 per cent, California state colleges. All of these refinements, however, do not detract from the major policy issue--

slightly over one-half of persons with 12 or less years of education entered the active labor force or the inactive population. The question is, what, if any, occupation-related training did these persons receive?

There is only partial evidence which could be pieced together to bear upon this problem. The Annual Reports for vocational education in California are so confusing that this researcher was not able to make sense of them.⁹ In 1965-66 it was reported that 225,000 high-school students and 156,000 junior college students were taking vocational education "courses." A distinction must be made between single "courses," a specific set of courses comprising a "curriculum," and groups of curriculums as program areas. Students may major in either of the two latter--"curriculums" or "programs" but figures for total enrollment in "courses" are hard to interpret. While for junior colleges there is a reported enrollment by occupation-oriented curriculums (business, engineering, technical, apprentices, health and agriculture) and total enrollment of "majors" by program, one is totally in the dark as to the enrollment by programs and/or curriculums in high schools.

Obviously, one student may take more than one "vocational" educational course. Thus, comparing total enrollment in high schools (1,100,000) with total "course" enrollment (225,000) indicates that certainly less than one-fourth of high-school students were enrolled in at least one "vocational" course. Those who took the program or a curriculum in the vocational area were substantially fewer--an arbitrary guess would be less than 10 per cent. This is to be contrasted with the earlier statement that over 50 per cent of the age group enter the

labor market with 12 years or less of education. This is only a juxtaposition which should be verified by further special studies. However, the fact is clear that enormous disparity of the availability of occupation-oriented training opportunities exists, and the need for it by persons not continuing education beyond high school is tremendous.

Population Projections by Level of Educational Attainment

In order to verify past trends and potential educational requirements for the active and inactive population, the data on educational attainment should be examined. There is a certain circularity or continuous "feed-back" between present and projected educational attainments. Present educational attainment levels of the population are the function of past school outputs, namely the population in certain age groups beyond the level normally associated with school attendance. The future educational attainment of the population is the function of current and prospective outputs of the educational system (net of natural attrition). However, the latter--prospective output--is influenced by the currently accepted "image" of what educational attainment should be.

One example will suffice to make this idea of circularity clear. At the turn of the century, the majority of engineers had less than a high-school education. As a result of educational output, the majority of engineers today have 16 years of education, i.e., are college graduates. Therefore the "feed-back" image of minimally required educational attainment is 16 years for engineers. The projected educational

attainment is thus 16 years or more of education for engineers, and the educational system is geared to produce such output. A similar argument prevails in establishing the general educational requirements for the population at large. The median level of educational attainment of the entire population is 12 years; hence, due to the feedback image, all future educational outputs are to be geared to 12 years or more of education. Subjective as it may be, this is simply society's way of continuously "upgrading" its own population through education, and there is hardly any way that the political or social clock can be set back as far as the "demand" for education is concerned.

An examination of the educational attainment levels of the population, present vs. future, provides us with information as to what minimal "outputs" or effort of the educational system are required to meet the needs of this continuous upgrading of the educational process. Statistically, the process of looking at these data is as follows:

- A. Ascertain (compute/derive) present levels of educational attainment
 - B. Ascertain (compute/derive) future levels of educational attainment
 - C. Derive difference between B and A, plus
 - D. Ascertain natural losses of population by level of educational attainment
 - E. Sum of C plus D gives the "needed" new output requirements from the educational system
- Add

In essence, this procedure allows for the determination of educational outputs minimally required to perpetuate present and to improve further educational attainment.

Table 7 presents information for 1950 and 1960 on the educational attainment of the California population by number of years of schooling completed. The concern is with the number of persons 18 years old or older who have had four years of high school education or more.

During the decade of the 1950's the California public schools produced 915,000 high-school graduates (Table 6). If the number of parochial school graduates (and this, in the absence of adequate statistics, is just a guess) is added--about 75,000, the total output would have been about 990,000. By comparing the difference in the last row of Table 7, it is evident that during the decade of the 1950's the net increment for the State of persons with 12 years or more of schooling was about 1,767,000. If we do not allow for attrition during the decade of the 1950's, then California gained about 780,000 persons with 12 or more years of education, over and above what it had produced in the state system of education, namely 990,000 graduates. If we assume the natural attrition during the decade in question as 10 per cent of the 1960 base (this is a crude approximation--a more refined calculation could be made on the basis of survival tables, but for the sake of the present argument, such refinement is not needed), then natural losses were 460,000. Thus the total is 1,240,000 persons with 12 or more years of education--a figure representing net migration to California. These persons were not products of the California system of education. They were migrants from other states.

Table 7

EDUCATIONAL ATTAINMENT OF CALIFORNIA POPULATION:
YEARS OF SCHOOL COMPLETED, 1950 AND 1960

	1950		1960	
Population aged 25 and older	6,558,000		8,868,900	
Years of school completed:	<u>Per cent</u>	<u>No. of persons</u>	<u>Per cent</u>	<u>No. of persons</u>
None	1.8	114,800	1.9	164,300
Elementary:				
Grades 1-4	5.2	329,700	3.8	340,700
5-7	10.5	669,500	8.9	795,000
8	16.5	1,051,800	13.7	1,212,300
High school:				
1-3 yrs.	18.4	1,171,600	20.2	1,788,000
4 yrs.	27.6	1,758,700	28.3	2,509,900
College:				
1-3 yrs.	11.5	734,500	13.4	1,185,900
4 or more yrs.	8.4	532,700	9.8	872,700
4 years of high school or more	47.5	3,025,900	51.5	4,568,500
Population aged 18-24	1,039,400		1,395,150	
Hypothetical number of 18- to 24-year-olds with 4 years of high school or more	493,700		718,500	
Hypothetical number of 18-year-olds and older with 4 years of high school or more	3,519,600		5,287,000	

SOURCE: U.S. Dept. of Commerce, Bureau of the Census, United States Census of Population 1960: California, General Social and Economic Characteristics, Final Report PC(1)-6C, Washington, D.C.: U.S. Government Printing Office, 1962, Tables 46 and 47, p. 6-234-36.

Essentially, this points up a crucial policy issue; namely, in the 1950's almost two-thirds of the increase in high-level manpower in California was attributable to net migration rather than output from the state educational system. Although at times one hears rather loose talk about "some" contribution from net migration to the California trained manpower pool, it appears that there is a genuine brain-drain from the rest of the nation which benefits California to an exceptional degree. In order to reproduce such resources, the State of California would have to better than double or even triple its actual output of high-level manpower (persons with 12 or more years of education). Whatever is said about the magnitude of effort by the State of California, the plain fact is that it should have been far greater if it was to satisfy the educational requirements of the State during the last decade.

There are no data for the State of California which project educational attainment levels of the population. In order to estimate the future educational attainment, national projections adjusted to the California base must be used. Table 8 presents data on the actual and projected attainment levels of the United States population, prepared by the U.S. Bureau of the Census. By using standard projection techniques,¹⁰ namely, applying the national trend to the California base, the projected educational attainment levels for the California population can be calculated. They are presented in Table 9. The main question is--what will the school output situation be in the State of California in the 1960's and beyond?

Table 8

EDUCATIONAL ATTAINMENT OF THE UNITED STATES POPULATION, PER CENT DISTRIBUTION BY YEARS OF SCHOOL COMPLETED BY PERSONS 25 YEARS AND OVER, 1950, 1960 AND PROJECTIONS TO 1985

Year	Number of years of school completed										12 or more
	None	1-4	5-7	0-7	8	9-11	0-11	12	13-15	16 or more	
1950 (actual)	2.6	8.6	16.4	27.6	20.8	17.4	65.8	20.7	7.3	6.2	34.2
1960 (actual)	1.8	6.3	13.3	21.4	17.5	18.9	57.8	26.4	8.2	7.6	42.2
1970 (proj.)	1.5	4.2	10.8	16.5	13.6	20.7	50.8	29.0	10.0	10.2	49.2
Trend <u>1960-70</u>	0.83	0.66	0.81	0.77	0.78	1.09	0.88	1.14	1.22	1.34	1.17
1980 (proj.)	0.8	2.6	7.5	10.9	9.4	20.8	41.1	34.1	11.5	13.3	58.9
Trend <u>1960-80</u>	0.44	0.41	0.56	0.51	0.54	1.10	0.71	1.29	1.40	1.75	1.40
1985 (proj.)	0.6	2.0	6.1	8.7	7.5	20.4	36.6	36.4	12.3	14.7	63.4
Trend <u>1960-85</u>	0.33	0.32	0.46	0.41	0.43	1.08	0.63	1.38	1.50	1.93	1.53

Note: Projections to 1985 are based on the so-called "A-Series," namely an increase in the rate of change of educational attainment proportionate to the rate of change of passage rates of students over the past two decades.

SOURCES: 1950 and 1960 data from U.S. Dept. of Commerce, Bureau of the Census, Current Population Reports: Population Characteristics, Series P-20, No. 291, Washington, D.C., Jan. 12, 1959, Table 2, pp. 8-9. Projections to 1985 (retabulated by author) from U.S. Dept. of Commerce, Bureau of the Census, Current Population Reports: Population Estimates, Series P-25, No. 305, Washington, D.C., Apr. 14, 1965, Table 2, pp. 14-16.

Table 9

EDUCATIONAL ATTAINMENT OF THE STATE OF CALIFORNIA POPULATION, PER CENT DISTRIBUTION BY YEARS OF SCHOOL COMPLETED BY PERSONS 25 YEARS AND OVER, 1950, 1960 AND PROJECTIONS TO 1985

Year	Number of years of school completed										12 or more
	None	1-4	5-7	0-7	8	9-11	0-11	12	13-15	16 or more	
1950 (actual)	1.8	5.2	10.6	17.6	16.5	18.4	52.5	27.6	11.5	8.4	47.5
1960 (actual)	1.9	3.8	8.9	14.6	13.7	20.2	48.5	28.3	13.4	9.8	51.5
1970 (proj.)	NC	NC	NC	10.6	10.2	20.8	41.6	30.6	15.4	12.4	54.4
1980 (proj.)	NC	NC	NC	6.7	6.8	20.3	33.8	33.3	17.2	15.7	66.2
1985 (proj.)	NC	NC	NC	5.3	5.3	19.5	30.1	35.0	18.0	16.9	69.9

SOURCES: Data for 1950 and 1960 from U.S. Dept. of Commerce, Bureau of the Census, United States Census of Population 1960; California: General Social and Economic Characteristics, Final Report PC(1)-6C, Washington, D.C.: U.S. Government Printing Office, March 1962, Table 47, p. 6-235. Projections for 1970, 1980 and 1985 are based on U.S. national projections (Table 8) adjusted for the State of California 1960 distribution. Estimating technique: (1) derive national trend (matrix cell of future year divided by matrix cell of base year); (2) multiply state distribution (matrix cell of base year) by national trend factor to obtain future year values; (3) by pro-rating, arrive at future year distribution.

NC--Not computed

There are two ways of looking at this situation--one in relative terms (per cent distribution by number of years of school completed, as given in Table 8 and Table 9) and the other in absolute terms (converting the per cent distribution to numerical values for different years). In proportionate terms the present rates of educational output (as judged by the rates of high-school completion and access to higher education presented in Chart II) exceed the actual (1960) educational attainment ratios. This means that the California educational system is currently geared to produce outputs proportionate to past educational attainment ratios. If the present trend prevails, in the 1970's and 1980's the secondary schools will undoubtedly be also geared to produce the required proportions of graduates and of school leavers. There is, however, a need to expand the access rates to higher education (particularly of four or more years) if the future proportion of college graduates is to be produced at the projected rates. With the total number of degrees (from 4-year colleges or more) granted in the State by public and private universities of 40,000 (in 1966), which represents approximately 12 per cent of the age group, the output is about in proportionate "balance" (i.e., about the same proportion as the projected 1970 educational attainment ratio for persons with 16 or more years of education). However, this ratio is too low to satisfy the requirements in the 1980's. It was beyond the terms of reference of this study to deal with higher education college graduates, but it must be stated that the dependence of the State of California upon the importation of persons with 16 or more years of education indeed staggers the imagination (see calculations below).

This matching of "proportions" is deceptive, however, for in absolute terms the State will either have a significant need to "import" high-level manpower, or to step up its own indigenous (within state) educational effort. Converting the per cent distributions (Table 9) of projected educational attainment (i.e., "need") and comparing these with projected outputs of high-school graduates (derived from Table 6) result in the following calculations:

Situation during the Decade of the 1960's:

A. Number of persons with 12 or more years of education (1960)	4,570,000
B. Number of persons with 12 or more years of education (1970)	8,156,000
C. Difference, B minus A	3,586,000
D. Assumed natural attrition of 10 per cent of 1970 base	816,000
E. Total "new" additions requirement for persons with 12 or more years of education	4,402,000

The expected output of high-school graduates by the State system of education during the decade of the 1960's will be about 2,000,000. Compared with the requirement for "new output" of 4,402,000 during the decade, it is obvious that a net import (migration) of about 2,400,000 would be required. Obviously, if the natural attrition is somewhat less or if the in-state output of graduates is greater, the figure of required net migration for high-level manpower might be somewhat reduced. The approximate magnitude, however, will remain about the same: California would need a net migration of over 2,000,000 persons with

12 or more years of education to maintain the educational attainment levels of its population. At least one-fourth of the total high-level manpower by 1970 must be covered from sources outside the state.

Situation During the Decade of the 1970's:

A. Number of persons with 12 or more years of education (1970)	8,156,000
B. Number of persons with 12 or more years of education (1980)	12,530,000
C. Difference, B minus A	4,374,000
D. Assumed natural attrition of 10 per cent of 1980 base	1,253,000
E. Total "new" additions requirement for persons with 12 or more years of education	5,627,000

The expected output of high-school graduates by the State system of education during the decade of the 1970's will be about 3,000,000 persons. Compared with the requirement of "new output" of 5,627,000 during the decade, a net import of 2,627,000 persons with 12 or more years of education would be needed to meet the requirements by 1980.

Granted, all the aforementioned calculations are approximate and these data indicate a decreasing dependence on the part of the State upon imported high-level manpower, the corollary proposition remains true. There must be a substantial increase in the annual output of high-school graduates from the State system. This should be achieved not by a mere increment in enrollment, but by a substantial improvement in the success rates of students in secondary schools and a corresponding reduction in the dropout rate.

There is still an additional alternative. If the 65 to 70 per cent of the total adult population of the State is to be brought to a level of educational attainment of 12 or more years, the State could intensify its continuing and remedial education and thus reduce the net import requirement for high-level manpower. In either case, a far greater effort and far greater efficiency by the State educational establishment would be needed in order to reduce its dependence on the net migration of high-level manpower, as well as the expansion of in-state facilities to educate the population of the state.

Aside from public primary-secondary education, one of the major problems in the State of California is that although the rates of access to post-secondary education are high, the actual output of graduates from both the public and private systems of higher education in the State remains considerably below requirements, which can be ascertained on the basis of educational requirements for the population. If we assume that 46 per cent of the age group (Chart II) continued on to some sort of higher education in the State, the actual output of all university degree awards (16 or more years of education) from all public and private institutions in the state was only 40,000 in 1966.

This study cannot be entangled in a lengthy survey of those Californians who studied elsewhere in the nation, nor in a statistical assessment of the share of non-California residents who are graduates of California institutions of higher education. However, although 46 per cent of the respective age group (17- or 18-year-olds) of Californians entered one type of higher education or another in 1966, only about 12 per cent of the respective age group (21- or 22-year-olds) completed

higher education in the State.

Such low rates of success have direct relevance for policies concerning post-secondary education in the State and bear an indirect implication for educational policies in public primary-secondary schools. If only about one-quarter of the age group who enters higher education succeeds in completing it, there is an obvious need to strengthen secondary education for those who continue on to college and to provide occupation-oriented training for those who fall by the wayside. Whatever the case, the situation of in-state education to meet its needs for college graduates from the indigenous population is most inadequate. Table 10 summarizes the actual and projected trends concerning the requirements and supply of persons with 16 years of education or more.

On the basis of the data in Table 10, it is evident that the output of college graduates from the California system of higher education in the 1950's was able to meet the needs of the State by only two-fifths. A similar situation prevails in the 1960's--the California production of college graduates accounts for only two-fifths of the gross additions needed. Even if the optimistic projections for higher education materialize, only about one-third of the gross demand for higher education graduates will be met by California institutions of higher education in the 1970's. Three education policy issues are paramount from these data:

- (1) The State of California is totally deficient in producing its own indigenous college graduate population
- (2) Unless there are substantial improvements in the quality of secondary education, the ineffectiveness of tertiary education will continue

Table 10

**COLLEGE GRADUATES IN THE STATE OF CALIFORNIA:
REQUIREMENTS AND OUTPUT OF PERSONS WITH 16 OR MORE YEARS OF
EDUCATION, 1950-1980**

Stocks

Persons with 16 years or more of education in
the population, 21 years and older:

1950 (actual)	532,000
1960 (actual)	873,000
1970 (projected)	1,625,000
1980 (projected)	2,744,000

Natural Attrition

Attrition (at 10 per cent of 1960 base), 1950-59	87,000
Attrition (at 10 per cent of 1970 base), 1960-69	163,000
Attrition (at 10 per cent of 1980 base), 1970-79	274,000

New Additions--Gross Requirement

For 1950-59	428,000
For 1960-69	915,000
For 1970-79	1,393,000

Output of Graduates with 16 or More Years of
Education from Public and Private Colleges
of the State of California

1950-59 (actual)	180,000
1960-69 (estimated)	380,000
1970-79 (anticipated)	550,000

SOURCES:

Stocks: Table 8 and Table 9; population 21 and older from:
State of California, Department of Finance, Revenue and
Management Agency, California Population Projections, 1965-
2000, Sacramento, March, 1966, passim.

Natural attrition: Computed at 10 per cent of base year.

New additions--gross requirement: Difference between respective
rows in "stocks" plus "Natural Attrition" figures.

Output of graduates: State of California, Documents Section,
California Statistical Abstract, 1967, Sacramento, 1967,
p. 110; anticipated data for 1970 derived from: State of
California, Department of Finance, Projections of Enroll-
ment for California's Institutions of Higher Education, 1965-75,
Sacramento, October, 1960, passim.

- (3) If there is such difficulty in retaining higher education students until the completion of their education, occupation-oriented education must be introduced into all higher educational institutions, and particularly into junior and community colleges.

The gross magnitudes discussed above are indicative, however. This entire problem of California's self-sufficiency in producing personnel with 16 or more years of education must be thoroughly investigated and monitored on a continuing basis. The recent report to the Joint (Legislative) Committee on Higher Education clearly supports this need:

Greater effort should be given to assembling information on the migration patterns of persons receiving higher education in California. The extent to which they migrate outside the county in which they were educated (if they attended a Junior College), and outside the state itself (if they attended a State College or the University) deserves exploration. . . . Similarly, the extent to which people receiving higher education elsewhere move into California and become taxpayers is also of considerable interest in examining the trade "balance" in educated people.¹¹

Occupational Requirements by Educational Attainment

The greatest preoccupation in setting targets for education, derived from manpower needs, rests not solely with the educational attainment levels of the total (or adult) population as discussed above, but with the active population, i.e., persons in the labor force. In California, labor force participation rates for the population aged 14 and older are about 60 per cent,¹² which is somewhat higher than the national average of about 52 per cent. The standard procedure for examining data on occupational requirements is to devise an employment

matrix by industry sector, rearrange this matrix by occupation within each industry sector, and finally sum up by specific occupations or by broad occupational groups the past, current or projected manpower needs. The next step in deriving educational prerequisites is to assign educational attainment levels for each occupation or for broad occupational groups. The occupational classification developed by the U.S. Bureau of the Census deals with 479 specific occupations, which are then classified into 11 major occupational groups.¹³ Obviously, the present study could not deal with specific occupations, and the data dealt with below refer to major occupational groups only.

The various state departments of California do not make employment projections for the State either by industry sector or by occupation. There are a number of private efforts which use the U.S. Department of Labor (Bureau of Labor Statistics) or the National Planning Association technique of projecting employment in relationship to population under assumed ratios of participation or by the use of matrices of employment. The California Department of Employment makes tabulations of employment in the state by industry sector.¹⁴ The office in Sacramento is contemplating an exercise which would project the occupational requirements of California for the year 1975, based on national matrices prepared by the Bureau of Labor Statistics. In view of this, the present report had to proceed without recourse to a data bank which should exist in state agencies, but does not.

Table 11 summarizes data from a still unpublished study of the Bureau of Labor Statistics, projecting occupational requirements for the United States for 1975.¹⁵ On the basis of these data and by ad-

Table 11
 EMPLOYMENT BY MAJOR OCCUPATIONAL GROUP, UNITED STATES, 1960, 1965 and 1975
 PROJECTION

Occupational Groups	1960	1965	1975	Nat'l growth trend	
				1960-75	1965-75
<u>White-collar workers</u>	28,726,000	32,104,000	42,500,000	1.480	1.320
Professional and technical Managers, officials and proprietors	7,475,000	8,883,000	12,900,000	1.725	1.450
Clerical workers Sales workers	7,067,000	7,340,000	9,200,000	1.301	1.250
	9,783,000	11,166,000	14,600,000	1.492	1.310
	4,401,000	4,715,000	5,800,000	1.317	1.230
<u>Blue-collar workers</u>	24,211,000	26,466,000	30,140,000	1.240	1.140
Craftsmen and foremen	8,560,000	9,221,000	11,400,000	1.331	1.240
Operatives	11,986,000	13,390,000	15,000,000	1.251	1.200
Non-farm laborers	3,665,000	3,855,000	3,740,000	1.020	0.970
<u>Service workers</u>	8,349,000	9,342,000	12,560,000	1.504	1.340
<u>Farmers and farm workers</u>	5,395,000	4,265,000	3,460,000	0.652	0.810
TOTAL	66,681,000	72,179,000	88,660,000	1.330	1.230

Note: Occupations not reported or not classified by occupation have been excluded. In 1960 this category accounted for about 2,000,000 persons.

SOURCE: Data for 1960 and 1975 abstracted from U.S. Department of Labor, Bureau of Labor Statistics, Tomorrow's Manpower Needs: National Manpower Projections and a Guide to Their Use as a Tool in Developing State and Area Manpower Projections, 1967 (unpublished draft), Appendices G and H. 1960 data from Table 9I (p. 534). Trend coefficients computed.

justing them to California trends, 1975 estimates of occupational requirements for the State of California are made. These data are presented in Table 12. In addition, extrapolating the trends for 1965-75 to the period 1975-85 allows for a projection (however crude) of the occupational composition of the employed civilian labor force of the State of California for the year 1985. These data are also presented in Table 12.

Three major observations should be noted:

- (1) A continuing and most rapid increase in the occupational groups which constitute white-collar occupations;
- (2) Some growth, but not as rapid, in the blue-collar and service occupations;
- (3) Continuing decline in agricultural occupations.

There is no surprise in identifying these trends. What is important, however, is to note that if the guidance and counseling in schools is to be improved, it is this type of information which must be clearly understood by the counsellors themselves and particularly kept in mind by the students selecting career choices.

In order to accomplish this (and data similar to those presented in Table 11 and Table 12 are neither published nor publicized), and particularly if the disaggregation for specific occupations is made, the State of California should develop and make available to the schools a computer utility which could be used for guidance and counseling. Such computer utilities are already being developed in other states (and groups of school districts, particularly those in urban metropolitan areas). The State Committee on Public Education should point up

Table 12

EMPLOYMENT BY MAJOR OCCUPATIONAL GROUPS, STATE OF CALIFORNIA, ACTUAL FIGURES FOR 1960
AND PROJECTED FIGURES FOR 1975 AND 1985

	1940	1950	1960	1960-75 national growth rate	Calif. 1975 Projection	Assumed 1975-85 growth factor	Calif. 1985 Projection
<u>White-collar workers:</u>	1,079,000	1,758,500	2,723,900	--	4,081,300	--	5,448,200
Professional and technical	262,600	432,500	787,900	1.725	1,376,400	1.45	1,995,800
Managers, officials and proprietors	266,600	441,900	550,800	1.301	716,600	1.25	895,000
Clerical	283,700	550,100	937,200	1.492	1,398,300	1.31	1,831,400
Sales	266,100	334,000	448,000	1.317	590,000	1.23	726,000
<u>Blue-collar workers:</u>	854,200	1,413,000	1,905,900	--	2,391,700	--	2,861,300
Craftsmen and foremen	327,700	594,500	803,600	1.331	1,069,600	1.24	1,326,300
Operatives	371,300	598,500	855,800	1.251	1,070,600	1.20	1,291,000
Laborers	155,200	220,000	246,500	1.020	251,500	0.97	244,000
<u>Service workers</u>	316,500	432,900	599,100	1.504	901,000	1.34	1,207,300
<u>Farmers and farm workers</u>	246,600	264,100	222,200	0.652	144,900	0.81	117,400
TOTAL	2,496,300	3,868,500	5,451,100	--	7,388,400	--	9,634,200

Note: Occupations not reported or not classified by occupation have been excluded. In

1960 this category accounted for approximately 200,000 persons.

SOURCE: 1940, 1950, and 1960 tabulations based on data in U.S. Dept. of Commerce, Bureau of the Census, United States Census of Population 1960; California: General Social and Economic Characteristics, Final Report PC(1)-6 C, Washington, D.C.: U.S. Government Printing Office, March 1962, Table 59, p. 6-245. National growth factors are assumed on the basis of U.S. data (Table 11). Growth factors are based on BLS matrix. Due to aggregation, BLS reporting by occupational group shows an 87 to 95% fit with census data for 1960. No "reconciliation adjustments" were made.

the need and propose that such a utility be developed under the auspices of the California State Manpower Council or Human Resource Development Board. The computer utility for occupational guidance and counseling should be subsidized by the State Department of Education, and probably should be made available to school districts on an additional "fee" or "subscription" basis. It is mandatory, however, that the "State Manpower Council" or "Human Resources Development Board" ask the respective Department of Employment, Industry, Health, etc., to cooperate and provide information for such an in-state occupational guidance facility.

As already indicated, the agencies of the State of California do not deal either with occupational projections or with educational attainment data by occupational groups. Such data for the employed civilian population are available for census years and are developed by the Bureau of Labor Statistics on a periodic basis. Tables 13 and 14 summarize educational attainment data for the employed population of the United States for March of 1959 and March of 1966. It is the last column in each table which is relevant. These data can be utilized for projecting the requirements for persons having 12 or more years of education, namely, high-school graduates and those with post-secondary education (or any sub-group by level of educational attainment). These data may also be used to make estimates for other cells of the educational attainment matrix (an exercise outside the scope of the present study). Thus combining the information in Table 11 and Table 12 with that in Table 13 and Table 14, the present and projected requirements

Table 13
 EDUCATIONAL ATTAINMENT (YEARS OF SCHOOLING COMPLETED) OF THE EMPLOYED CIVILIAN POPULATION
 OF THE UNITED STATES, 18 YEARS AND OVER, MARCH 1959

Occupational groups	Number of years of school completed						12 or more	
	0-7	8	9-11	0-11	12	13-15		16 or more
<u>White-collar workers:</u>								
Professional and technical Managers, officials and proprietors	1.7	1.7	3.5	6.9	18.3	18.7	56.1	93.1
Clerical workers	10.2	12.3	16.3	38.8	32.3	15.7	13.1	61.1
Sales workers	3.0	5.7	13.8	22.5	58.1	14.5	4.9	77.5
	6.7	10.6	16.8	34.1	39.9	16.0	10.1	66.0
<u>Blue-collar workers</u>								
Craftsmen and foremen	15.1	18.7	25.8	59.6	32.4	5.9	2.1	40.4
Operatives	21.4	21.0	28.4	70.8	25.0	3.5	0.8	29.3
Non-farm laborers	41.6	17.4	21.2	80.2	16.6	2.8	0.5	19.9
<u>Service workers</u>	26.2	19.7	23.9	69.8	24.0	4.8	1.4	30.1
<u>Farmers and farm workers</u>	35.9	24.8	14.8	75.5	19.1	3.8	1.4	24.3
TOTAL	16.2	14.6	19.0	49.8	30.7	9.4	10.0	50.1

SOURCE: U.S. Dept. of Labor, Bureau of Labor Statistics, Educational Attainment of Workers, 1959, Special Labor Force Report No. 1, reprinted from Monthly Labor Review, Feb. 1960, reprint No. 2333, p. A-12. For convenience, the years of schooling completed have been reclassified in sequential order, i.e., 9-12--high school; 13-16--college.

Table 14

**EDUCATIONAL ATTAINMENT (YEARS OF SCHOOLING COMPLETED) OF THE EMPLOYED CIVILIAN POPULATION
OF THE UNITED STATES, 18 YEARS AND OVER, MARCH 1966**

Occupational groups	Number of years of school completed							16	12
	0-7	8	9-11	0-11	12	13-15	or more	or more	
<u>White-collar workers:</u>									
Professional and technical Managers, officials and proprietors	0.4	1.0	3.2	4.6	18.3	17.9	59.1	95.3	
Clerical workers	5.2	7.6	14.0	26.8	35.8	17.9	19.6	73.3	
Sales workers	1.6	4.0	12.4	18.0	60.9	16.4	4.8	82.1	
	4.1	7.5	18.3	29.9	43.3	15.4	11.3	70.0	
<u>Blue-collar workers:</u>									
Craftsmen and foremen	11.4	15.3	24.5	51.2	39.9	7.2	1.7	48.8	
Operatives	16.2	17.3	28.6	62.1	33.0	4.2	0.6	37.8	
Non-farm laborers	27.8	18.1	25.3	71.2	24.3	4.1	0.4	28.8	
Service workers:	18.5	15.8	25.3	59.6	32.5	6.8	1.1	40.4	
Farmers and farm workers:	30.2	24.5	14.9	69.6	24.8	3.8	1.8	30.4	
TOTAL	10.6	11.3	18.6	40.5	36.5	10.9	12.1	59.5	

SOURCE: U.S. Dept. of Labor, Bureau of Labor Statistics, Educational Attainment of Workers, March 1966, Special Labor Force Report No. 83, reprinted from Monthly Labor Review, June 1967, reprint No. 2528, p. A-13. For convenience, the years of schooling completed have been reclassified in sequential order, i.e., 9-12--high school; 13-16--college.

of persons with 12 or more years of education can be derived for the state.

The data on actual and projected employment of high-level manpower (persons with 12 or more years of education) are presented in Table 15 and Table 16. These data have to be considered in conjunction with the population by corresponding level of educational attainments. In 1960, out of a total number of 5,287,000 persons with 12 or more years of education in the population, 2,950,000, or some 55.8 per cent, were actually employed in the civilian labor force. In other words, about 45 per cent of those with 12 or more years of education were in the inactive population. The rate of employment of high-level manpower in the state was not significantly different from the labor force (to adult population) participation ratios.

If we assume that the educational attainment ratios of 1966 for the civilian labor force will prevail in 1975, or if we alternatively assume the continuing rate of improvement of educational attainment by occupational group, we can derive the 1975 requirement for California for persons with 12 or more years of education. This information is presented in Table 16. The relevant consideration, of course, is that better than half of the total gainfully employed labor force will need, even in 1975, 12 or more years of education. The Version II estimate of Table 16 might perhaps be too optimistic in projecting 1959-67 trends for the entire period 1960 to 1975, but in this case well over two-thirds of the total labor force would be required to have 12 or more years of education.

Table 15

**ESTIMATED EMPLOYMENT BY OCCUPATIONAL GROUP AND EDUCATIONAL ATTAINMENT OF PERSONS WITH
TWELVE OR MORE YEARS OF SCHOOLING IN THE
STATE OF CALIFORNIA, 1960**

<u>Occupational group</u>	<u>1960</u> California employment	<u>1959</u> ratio	<u>Total persons</u> with 12 or more years of education
<u>White-collar workers</u>	--	--	2, 092, 000
Professional and technical Managers, officials and proprietors	787, 900	93.1	733, 500
Clerical workers	550, 800	61.1	336, 500
Sales workers	937, 200	77.5	726, 300
	448, 000	66.0	295, 700
<u>Blue-collar workers</u>	--	--	624, 400
Craftsmen and foremen	803, 600	40.4	324, 600
Operatives	855, 800	29.3	250, 700
Non-farm laborers	246, 500	19.9	49, 100
<u>Service workers</u>	599, 100	30.1	180, 300
<u>Farmers and farm workers</u>	222, 200	24.3	54, 000
TOTAL	--	--	2, 950, 700

SOURCES: Table 12 and Table 13. The 1960 stock of persons with 12 or more years of education actually employed is an underestimate, for in the calculations the category of persons in "occupation not reported" has been excluded.

Table 16

**ESTIMATED EMPLOYMENT BY OCCUPATIONAL GROUP AND EDUCATIONAL ATTAINMENT OF PERSONS WITH
TWELVE OR MORE YEARS OF SCHOOLING IN THE
STATE OF CALIFORNIA, 1975**

Occupational group	1966		1975		Persons with 12 or more yrs. educa.	1975 trend- adj. ratios	Persons with 12 or more yrs. education
	1975	actual attainment ratio	1975	actual attainment ratio			
<u>White-collar workers:</u>	--	--	3,004,700	--	3,004,700	--	3,652,000
Professional and technical Managers, officials and proprietors	1,376,400	95.3	1,330,400	95.3	1,330,400	97.4	1,340,600
Clerical workers	1,398,300	82.1	1,148,000	82.1	1,148,000	87.3	1,220,700
Sales workers	590,000	70.0	410,000	70.0	410,000	74.4	439,000
<u>Blue-collar workers</u>	--	--	999,100	--	999,100	--	1,292,900
Craftsmen and foremen	1,069,600	48.8	522,000	48.8	522,000	60.2	643,900
Operatives	1,070,600	37.8	404,700	37.8	404,700	50.5	540,600
Non-farm laborers	251,500	28.8	72,400	28.8	72,400	43.1	108,400
<u>Service workers</u>	901,000	40.4	364,000	40.4	364,000	56.6	510,000
<u>Farmers and farm workers</u>	144,900	30.4	44,000	30.4	44,000	61.2	88,700
TOTAL	--	--	4,451,800	--	4,451,800	--	5,543,600

Version I

Version II

Note: The Version II estimate is perhaps too optimistic in projecting 1959-66 trends for the entire period of 1960-75.

SOURCE: Estimates derived as follows:

Version I: By applying 1966 U.S. national ratios of educational attainment (Table 14) to 1975 California base (Table 12).

Version II: By linear extrapolation of 1959 (Table 13) to 1966 (Table 14) U.S. national trend of educational attainment ratios applied to 1975 California base (Table 12).

Since the biggest growth will occur in occupations where high levels of educational attainment are expected to prevail (such as professional technical workers, where 60 per cent have 16 or more years of education), the public secondary schools must therefore be prepared to respond to a duality of needs--on the one hand (as argued above), they must provide occupation-oriented training for school-leavers and those who will not continue on to higher education; and, on the other, they must improve the quality of education for those entering occupations requiring college or post-college education.

Regional Differences in Performance of California Public Schools

It is a well known fact that the State of California has the largest educational system with the highest per capita and the highest per pupil expenditure in the nation.¹⁶ However, there is a large degree of disparity in the efficiency of school performance and a high degree of inequality in the support of education throughout the State. According to the California Education Code,

The system of public school support should provide, through the foundation program, for essential educational opportunities for all who attend the public schools.¹⁷

The data presented below clearly indicate that such an objective is currently not being fulfilled, and the entire program of state support for education must be thoroughly re-examined in the light of the principle of equity and some reasonable judgment about "success" in producing educational outputs.

Initially, this study intended to produce a number of computations of correlation and regression coefficients between different per-student cost variables and outputs of the educational system. This attempt had to be abandoned, however, largely because of the absence of a comprehensive set of data and partly because of the limitations of time and financial resources allocated. Instead, the data below present a partial analysis of intra-state differences in school performance.

It must be noted in general that social and economic statistics are obtained either through census information or on the basis of surveys. In both cases, the collection and processing are extremely time-consuming and highly expensive undertakings. The collection of statistics without a prior and definite indication of the purpose for which they are to be used is often a wasteful undertaking. One needs to determine the questions needing answers before beginning data-gathering. The data thus collected can fill a definite purpose and if they are correctly organized, can be a point of departure for other statistical compilations serving as the fundamental information for basic policy decisions.

Without doubt, the present collection and processing of statistical information (such as enrollments, graduations, average daily attendance by school districts, and related educational expenditures) by the California Department of Education leave much to be desired. Although these data are used for the purposes of reallocation of state funds for public education, they are nevertheless often devoid of any operational meaning as far as cost-effectiveness techniques in making deci-

sions about the allocation of educational resources are concerned.

The performance of pupils in an educational system could be judged by I.Q. tests or some other achievement tests (in reading, arithmetic, etc.). A variety of such tests are given in the California schools, though their results are seldom made public. The educational "output" (and thus performance of the school system) can also be judged by transitional coefficients (Table 1 and Table 2 above; see also Table 18 below) and the rates of access of graduates of high schools to institutions of higher education (Chart II above; Table 19 below). The test of equity can be made by comparing the educational costs per pupil with the "success rates" of students, as stated above. Obviously the educational costs and "success rates" must be compared within the state in the context of some geographic grouping of school districts or school systems. Since there are different kinds of school district arrangements (elementary, high school, unified) within the State of California and since there is a significant degree of movement within as well as between districts, larger aggregates should be constructed. Obviously, the use of statistics in financing education has to be handled with great care. Sources of educational funds (local, state and federal) and the taxation base vary substantially among districts. The purpose of this exercise, however, is not to examine the revenue side of the educational budgets, but to focus attention on the differences in the real resource costs of education among the different economic areas of the state.

This study has adopted groupings by California State Economic Areas¹⁸ as aggregates. The data for individual counties have been

used as a base¹⁹ from which area aggregates were derived by groupings as follows:

Standard Metropolitan
(Statistical) Areas:

Counties Included:

San Francisco-Oakland-----	Alameda, Contra Costa, Marin, San Francisco, San Mateo
San Jose-----	Santa Clara
Sacramento-----	Placer, Sacramento, Yolo
Stockton-----	San Joaquin
Fresno-----	Fresno
Los Angeles-Long Beach-----	Los Angeles
San Diego-----	San Diego
San Bernardino-Riverside- Ontario-----	Riverside, San Bernardino
Bakersfield-----	Kern
Santa Barbara-----	Santa Barbara
Anaheim-Santa Ana-Garden Grove-----	Orange
Vallejo-Napa-----	Napa, Solano
Oxnard-Ventura-----	Ventura
Salinas-Monterey-----	Monterey

Non-Metropolitan Areas:

Northern Coast-----	Del Norte, Humboldt, Lake, Mendocino
North Central Coast-----	Sonoma
South Central Coast-----	San Benito, San Luis Obispo, Santa Cruz
Sacramento Valley-----	Butte, Colusa, Glenn, Sutter, Tehama, Yuba
North San Joaquin Valley-----	Merced, Stanislaus
South San Joaquin Valley-----	Kings, Madera, Tulare
Imperial Valley-----	Imperial
Sierra-----	Alpine, Amador, Calaveras, El Dorado, Inyo, Lassen, Mariposa, Modoc, Mono, Nevada, Plumas, Shasta, Sierra, Siskiyou, Trinity, Tuolumne

An examination of data by these economic areas of the state reveals the findings presented below.

Differential rates of access. Table 17 summarizes information from the 1960 Census of Population on the proportion of the age group 14-17 enrolled in (secondary) schools. The corresponding data for the

Table 17

PROPORTION OF YOUTHS AGED 14-17 ENROLLED IN SCHOOL AND INDEX OF SCHOOL ENROLLMENT BY ECONOMIC AREAS OF THE STATE OF CALIFORNIA, 1960

Area	Proportion of 14-17 year olds in school	Index
State Total	89.7	100
<u>Standard Metropolitan (Statistical) Areas:</u>		
San Francisco-Oakland	92.8	104
San Jose	91.6	102
Sacramento	92.8	103
Stockton	85.6	95
Fresno	87.7	98
Los Angeles-Long Beach	90.3	101
San Diego	81.8	91
San Bernardino-Riverside-Ontario	91.3	102
Bakersfield	89.4	100
Santa Barbara	89.0	99
Anaheim-Santa Ana-Garden Grove	90.4	101
Vallejo-Napa	91.2	102
Oxnard-Ventura	89.0	99
Salinas-Monterey	74.6	83
<u>Non-Metropolitan Areas:</u>		
Northern Coast	89.3	99
North Central Coast	88.4	99
South Central Coast	90.8	101
Sacramento Valley	92.3	103
North San Joaquin Valley	88.2	98
South San Joaquin Valley	87.2	97
Imperial Valley	86.8	97
Sierra	93.0	104

SOURCE: Retabulated from U.S. Department of Commerce, Bureau of the Census, United States Census of Population, 1960: California, General Social and Economic Characteristics, PC(1), 6C, Washington, D.C.: U.S. Government Printing Office, 1962, Table 83. Aggregation of county data by economic areas according to classification in text above.

age group 5-13 indicate that in all counties (and economic areas) there is no substantial variation of school enrollment to population ratios for grade 8 or below. Close to 99 per cent of all children are enrolled in school at these ages. The significant differences start with grade 9 and beyond, and these differences should be of particular concern to educational policy--what specific measures could be introduced in different areas in order to increase school enrollments to make secondary education truly universal?

Dropout Rates. Table 18 presents a tabulation of transitional coefficients (similar to those discussed for the total state in Table 1 and Table 2) between various grades of the secondary school, relating fall enrollments of 1962 to fall enrollments in 1963. The 10-year trend should have been examined more precisely on the basis of "averages," but one year's transitional coefficients (selected in the middle of the time-span interval of "improving" coefficients) are sufficient to indicate regional differences of school performance. It is mostly the major metropolitan areas which display the higher dropout rates and average indices above the statewide mean in transitional coefficients. Hence, in terms of educational policy, it is in these areas that school-retention or occupation-oriented training has to be improved and/or intensified.

Access to Post-Secondary Education. Table 19 summarizes the rates of access of 1965 high-school graduates of California public schools to public institutions of higher education (first-year entrants in the fall of 1965). With some minor exceptions, when junior college entrants are included, the aggregate rates of access of high-school graduates

Table 18

DROPOUT RATES (TRANSITIONAL COEFFICIENTS), GRADES 9-10, 10-11, 11-12, BY CALIFORNIA ECONOMIC AREAS, FALL 1962 TO FALL 1963

Area	Transitional Coefficients Fall to Fall					
	Grades 9-10		Grades 10-11		Grades 11-12	
	Ratio	Index	Ratio	Index	Ratio	Index
State Total	1.007	100	0.947	100	0.918	100
<u>Standard Metropolitan Statistical Areas:</u>						
San Francisco-Oakland	1.032	103	0.947	100	0.927	101
San Jose	1.012	101	0.976	103	0.955	104
Sacramento	0.997	99	0.946	100	0.939	102
Stockton	0.958	95	0.918	97	0.890	97
Fresno	0.931	92	0.918	97	0.901	98
Los Angeles-Long Beach	1.007	101	0.934	99	0.909	99
San Diego	0.978	97	0.939	99	0.917	100
San Bernardino-Riverside-Ontario	1.011	101	0.970	102	0.930	101
Bakersfield	0.940	93	0.927	98	0.888	97
Santa Barbara	0.997	100	0.974	103	0.915	100
Anaheim-Santa Ana-Garden Grove	1.055	105	1.015	107	0.958	104
Vallejo-Napa	0.980	97	0.990	105	0.947	103
Oxnard-Ventura	1.048	104	1.011	107	0.958	104
Salinas-Monterey	1.005	100	1.040	110	0.882	96
<u>Non-Metropolitan Areas:</u>						
North Central Coast	0.951	94	0.919	97	0.898	98
South Central Coast	1.018	101	0.988	104	0.953	104
Sacramento Valley	0.925	92	0.954	101	0.906	99
North San Joaquin Valley	0.941	93	0.894	94	0.908	99
South San Joaquin Valley	0.974	97	0.921	87	0.908	99
Imperial Valley	0.937	93	0.894	94	0.894	97
Sierra	0.956	95	0.934	99	0.885	96
	1.006	100	0.957	101	0.918	100

SOURCE: Based on reported enrollment by grade in: State of California, Department of Education, Enrollment in California Public Schools, October 31, 1962, Sacramento, 1963; and *ibid.*, October 31, 1963, Sacramento, 1964. Coefficients were verified from unpublished processing by: State of California, Department of Finance, Graded Enrollment Data, Sacramento, Aug. 1964 (courtesy of Mr. Joseph Freitas). Aggregation of county data into economic areas according to classification in text above.

Table 19

ACCESS RATES OF PUBLIC HIGH-SCHOOL GRADUATES (GRADE 12) TO PUBLIC INSTITUTIONS OF HIGHER EDUCATION (JUNIOR COLLEGES, CALIFORNIA STATE COLLEGES AND UNIVERSITY OF CALIFORNIA)
BY CALIFORNIA ECONOMIC AREAS, 1965

Area	Access Rates to Higher Education in Fall 1965 of Graduates from Grade 12 in Summer 1965		Junior colleges, CSC and UC UC combined		CSC and UC only	
	Rate	Index	Rate	Index	Rate	Index
State Total	0.542	100			0.096	100
<u>Standard Metropolitan Statistical Areas:</u>						
San Francisco-Oakland	0.595	110			0.133	138
San Jose	0.585	108			0.166	173
Sacramento	0.467	86			0.103	107
Stockton	0.558	103			0.062	65
Fresno	0.601	111			0.150	156
Los Angeles-Long Beach	0.527	97			0.111	116
San Diego	0.573	106			0.129	134
San Bernardino-Riverside-Ontario	0.442	82			0.069	72
Bakersfield	0.551	102			0.050	52
Santa Barbara	0.575	106			0.111	116
Anaheim-Santa Ana-Garden Grove	0.574	106			0.108	113
Vallejo-Napa	0.545	101			0.072	75
Oxnard-Ventura	0.516	95			0.070	73
Salinas-Monterey	0.620	114			0.062	65
<u>Non-Metropolitan Areas:</u>						
Northern Coast	0.607	112			0.146	152
North Central Coast	0.464	89			0.082	85
South Central Coast	0.611	113			0.067	70
Sacramento Valley	0.546	101			0.135	141
North San Joaquin Valley	0.533	98			0.069	72
South San Joaquin Valley	0.569	105			0.085	89
Imperial Valley	0.547	101			0.041	43
Sierra	0.464	86			0.087	91

SOURCE: Based on reported graduates from Grade 12 in: State of California, California Statistical Abstract 1967, Sacramento 1967, p. 107. Coefficients derived from unpublished processing by State of California, Department of Finance, Graded Enrollment Data, Sacramento, Aug. 1964 (courtesy of Mr. Joseph Freitas). Aggregation of county data into economic area according to classification in text above.

to higher education do not show great variation throughout the state. The exceptions are those areas where junior colleges are less developed. However, when the access rates to California state colleges and the University of California are considered, there is enormous variation among the different areas. The access rates in metropolitan areas are significantly higher than those in non-metropolitan areas. In conjunction with the data on educational-economic characteristics of state economic areas (see below), the high access rates to California state colleges and the University of California system correlate with high income and educational levels, a pattern which is not clearly discernible when access to junior colleges is included.

Educational and Economic Characteristics. Table 20 summarizes data on the median number of years of school completed and median family income, derived from the 1960 census for economic areas. It is often stated in research literature that the economic factor (i.e., median family income) and the cultural factor (in this study only the median number of years of school completed was used, but other indicators could be compiled) have a major influence upon school retention. However, a comparison of the data in Table 18 and in Table 20 reveals a perplexing pattern. Metropolitan areas with higher levels of educational attainment and higher income levels also display higher rates of school dropouts. The evidence presented above is not conclusive (the entire test should probably be redone on the basis of 10-year averages), but it appears to suggest that an inverse relationship exists between high levels of schooling and personal income and the dropout rate. It also suggests that urban (metropolitan) school prob-

Table 20

EDUCATIONAL (MEDIAN NUMBER OF YEARS OF SCHOOL COMPLETED) AND ECONOMIC (MEDIAN FAMILY INCOME) CHARACTERISTICS BY CALIFORNIA ECONOMIC AREAS, 1960

Area	Median number of years of school completed		Median family income	
	Median	Index	Dollars	Index
State Total	10.7	100	6,726	100
<u>Standard Metropolitan Statistical Areas:</u>				
San Francisco-Oakland	12.3	115	7,606	113
San Jose	12.2	114	7,843	117
Sacramento	11.6	108	6,973	104
Stockton	10.0	93	6,675	99
Fresno	10.5	98	6,488	96
Los Angeles-Long Beach	12.1	113	7,648	114
San Diego	12.1	113	6,969	104
San Bernardino-Riverside-Ontario	11.9	111	6,570	98
Bakersfield	10.9	102	6,471	96
Santa Barbara	12.2	114	7,257	108
Anaheim-Santa Ana-Garden Grove	12.2	114	7,628	113
Vallejo-Napa	11.6	108	6,744	100
Oxnard-Ventura	11.6	108	6,795	101
Salinas-Monterey	11.9	112	6,171	92
<u>Non-Metropolitan Areas:</u>				
Northern Coast	10.8	101	6,420	95
North Central Coast	11.1	104	6,472	96
South Central Coast	10.9	102	6,405	95
Sacramento Valley	11.3	106	6,085	91
North San Joaquin Valley	10.1	94	5,816	87
South San Joaquin Valley	9.3	87	5,680	85
Imperial Valley	9.0	84	6,409	95
Sierra	11.3	106	6,057	90

SOURCE: U.S. Department of Commerce, Bureau of the Census, United States Census of Population 1960: California, General Social and Economic Characteristics, PC(1) 6C, Washington, D.C.: U.S. Government Printing Office 1962, Tables 83 and 86; and State of California, California Statistical Abstract 1967, Sacramento, 1967, p. 103.

lems should be looked at in a different light from merely family income and, particularly, school expenditure (see below) points of view.

Educational expenses per student. Table 21 presents data on current educational expenses, graded enrollment and number of graduates from public schools for 1964-65. "Average daily attendance" is an artificial (in fact--phantom) statistical category--it differs slightly from reported enrollment (by 5 to 7 per cent), and all sorts of calculations performed in the financial accounts of the Department of Education using "ADA" figures might just as well be performed using the number of pupils actually enrolled. This is not the place to discuss the irrelevancies of "ADA" reporting. It is sufficient to state that calculations of the costs of education can be more concisely (and precisely) done on the basis of actual enrollment. These educational costs are a function of long-run periods. It takes 12 years of accumulated expenditures to produce a high-school graduate. Expenditures vary by grade level and school district. Also, price levels change from year to year, and therefore an adjustment to "constant prices" of school expenditures over the years must be made. To avoid these cumbersome problems (years of study by a staff of researchers would be needed to accomplish this task), the present report used a simplified approach. In examining area differences, school costs for one year were used as an indicator. In order to do so, only "current expenses" for education must be used.²⁰

Table 22 presents data on per-student "current expenses" and per-graduate "current expenses." This gives an instantaneous picture as if over the years costs did not vary and as if all graduates were

Table 21

TOTAL CURRENT EXPENSE OF EDUCATION, ENROLLMENTS (GRADES 1-12) AND NUMBER OF HIGH-SCHOOL GRADUATES BY CALIFORNIA ECONOMIC AREAS, 1964-65

Area	Total current expense of education	Enrollment (Gr. 1-12) Oct. 1964	Graduates June 1965
State Total	\$2,029,422,000	3,991,900	226,737
<u>Standard Metropolitan Statistical Areas:</u>			
San Francisco-Oakland	329,877,000	585,700	34,288
San Jose	86,576,000	221,100	11,496
Sacramento	91,586,000	183,400	11,567
Stockton	27,638,000	61,400	3,493
Fresno	47,466,000	104,700	5,338
Los Angeles-Long Beach	715,416,000	1,344,000	78,229
San Diego	129,528,000	1,245,200	15,725
San Bernardino-Riverside-Ontario	119,036,000	234,900	12,633
Bakersfield	43,584,000	83,500	4,497
Santa Barbara	28,111,000	53,900	2,802
Anaheim-Santa Ana-Garden Grove	125,255,000	276,000	14,413
Vallejo-Napa	26,259,000	52,000	3,103
Oxnard-Monterey	36,892,000	74,900	3,781
Salinas-Monterey	24,390,000	49,100	2,420
<u>Non-Metropolitan Areas:</u>			
Northern Coast	21,954,000	46,000	2,760
North Central Coast	18,862,000	40,700	2,348
South Central Coast	22,793,000	45,300	2,698
Sacramento Valley	25,965,000	57,100	3,208
North San Joaquin Valley	32,273,000	71,300	4,064
South San Joaquin Valley	32,629,000	71,600	3,813
Imperial Valley	9,007,000	20,600	914
Sierra	34,685,000	69,500	4,147

SOURCE: Expense--State of California, Annual Report of Financial Transactions concerning School Districts of California, Fiscal Year 1964-65, Sacramento, 1965, Table 3A, Table 3B and Table 3D, pp. 132-220. Enrollment--State of California, Department of Education, Enrollment in California Public Schools, October 31, 1964, Sacramento, Feb. 1965, pp. 8-10. Graduates--State of California, California Statistical Abstract 1967, p. 107.

Table 22
 CURRENT EXPENSES PER PUPIL AND CURRENT EXPENSES PER GRADUATE (GRADE 12) BY
 CALIFORNIA ECONOMIC AREAS, 1964-65

Area	Current expenses per pupil		Current expenses per graduate	
	Dollars	Index	Dollars	Index
State Total	510	100	9,156	100
<u>Standard Metropolitan Statistical Areas:</u>				
San Francisco-Oakland	563	110	14,044	153
San Jose	392	77	7,531	82
Sacramento	499	98	7,918	87
Stockton	450	88	7,912	86
Fresno	453	89	8,892	97
Los Angeles-Long Beach	532	104	9,145	99
San Diego	528	104	8,237	90
San Bernardino-Riverside-Ontario	507	99	9,423	103
Bakersfield	522	102	9,692	106
Santa Barbara	521	102	10,032	110
Anaheim-Santa Ana-Garden Grove	454	89	8,690	95
Vallejo-Napa	505	99	8,462	92
Oxnard-Ventura	493	97	8,757	95
Salinas-Monterey	604	118	10,078	110
<u>Non-Metropolitan Areas:</u>				
Northern Coast	469	92	7,824	85
North Central Coast	463	91	8,033	88
South Central Coast	503	99	8,448	92
Sacramento Valley	453	89	8,094	88
North San Joaquin Valley	453	89	7,941	87
South San Joaquin Valley	456	89	8,558	94
Imperial Valley	437	86	9,854	108
Sierra	499	88	8,364	91

SOURCE: Computed from data in Table 21.

products of that year's educational outlay. To repeat, the data in Column 1 and Column 3 of Table 22 do not represent actual direct costs of education, but only hypothetical per-student and per-graduate costs. The use of "current expenses" on education is indicative of the actual costs of education, which if calculated would probably be about one-third to two-fifths higher than indicated current expenses per pupil or per graduate (Table 22).

According to the data in Table 22, per-student or per-graduate "current expenses" (assumed to be proportionate to total costs of education) indicate that in most metropolitan areas these are usually significantly higher than the state average. Higher per-pupil costs and per-graduate expenses are obviously correlated with higher levels of educational attainment and higher family incomes (Table 20). This is not surprising. However, if we review these data in Table 22 in conjunction with the dropout rates already mentioned (Table 18), it is evident that high per-student or per-graduate expenses are associated with high percentages of dropouts. If we review these data in conjunction with access to further post-secondary education (Table 19), it is further evident that the metropolitan areas have higher per pupil expenses associated with preparing students for further post-secondary education. All this raises the major policy issue: there is an urgent need in the State of California to devise some radically new criteria for differential financial support for education which would recognize the regional differences in the problems of metropolitan area schools.

Retrospect

The State of California, in the decades to come, is faced with problems similar to those faced by the rest of the nation. However, because it is such a highly urbanized state, the severity of the problem in California is more pronounced. The range of these problems is succinctly summarized in the 1968 President's Message to Congress on Education as follows:

Whatever else we expect of the local school, we demand that it prepare each student for a productive life. The high school graduate who does not enter college needs not only knowledge enough to be a responsible citizen, but skills enough to get and keep a good job.

One and a half million young men and women will leave high school and enter the labor force this year--in a time of high employment, when skills are at a premium.

Too many of them will find that they have no job skills --or only marginal skills, or skills which are not really needed in their communities.

A high school diploma should not be a ticket to frustration.

We must do more to improve vocational education programs. We must help high schools, vocational schools, technical institutes, and community colleges to modernize their programs, to experiment with new approaches to job training. Above all, we must build stronger links between the schools and their students, and local industries and employment services, so that education will have a direct relationship to the world the graduating student enters.

I recommend that Congress enact the Partnership for Learning and Earning Act of 1968.

The new program--streamlining and strengthening our vocational education laws--will:

Give new flexibility to our system of matching grants so the states can concentrate their funds where the need is greatest.

Provide \$15 million for special experimental programs to bridge the gap between education and work: for alliances between schools, employment services and private employers; for new summer training programs combining work and education.

Totally revise and consolidate our existing vocations education laws, reducing paperwork for the states, the schools and other training centers.

Encourage the states to plan a long-range strategy in vocational education.²¹

The issues are so pointedly stated in the message of the President of the United States, which calls for recognition of the fact that education and employment must be related. Many people, particularly those in the educational establishment, confuse education with formal schooling as an end in itself. The acquisition of knowledge, the development of productive skills, and the mastery of occupational tasks depend on many variables and many institutions. Public education, both in the nation and in the State of California, must be guided by and geared to the exogenous demand for its products--the educated people who are needed by society in the world of work. This calls for a cooperative effort on the part of the public schools with other agencies of the state and with private employers in order to develop better occupation-oriented education and more efficient means to synchronize education with tomorrow's manpower needs.

FOOTNOTES

1. See, for example: Battelle Memorial Institute, Manpower and Regional Economics Division, Socio-Economics Research Section, Final Report on the Michigan Manpower Study: An Analysis of the Characteristics of Michigan's Labor Force in the Next 15 Years, Columbus, Ohio, Nov. 1966; and U.S. Department of Labor, Bureau of Labor Statistics, Tomorrow's Manpower Needs: National Manpower Projections and a Guide to Their Use as a Tool in Developing State and Area Manpower Projections, Washington, D.C.: U.S. Government Printing Office, 1967. There are a number of adaptations of the latter national study to states and localities (Michigan, Ohio, Indiana, Colorado, New York, etc.) in developing matrices of occupational requirements with calculations made by computer.
2. Nicholas DeWitt, "High Level Manpower and Development of Higher Education: Some Considerations for the Use of the Manpower Approach to the Study of Allocation of Resources for and Planning of Further Development of Higher Education in the State of California," a staff position paper prepared for the exclusive use of the Joint Committee on Higher Education, California Legislature, Feb. 15, 1967. Also W. Lee Hansen and Burton A. Weisbrod, Benefits and Costs of Public Higher Education in California, A Report to the Joint Committee on Higher Education, California Legislature, Nov. 15, 1967, esp. p. V-2.
3. The most eloquent general summary of problems is presented in: Eli Ginzberg, Manpower Agenda for America, New York: McGraw-Hill Book Co., 1968. In reference to work-skill orientation in public schools, see esp.: C.S. Benson and P.R. Lohnes, "Public Education and the Development of Work Skills," Harvard Educational Review, Vol. XXIX, No. 2 (Spring 1959), 137-150; and by the same authors, "Skill Requirements and Industrial Training in Durable Goods Manufacturing," Industrial and Labor Relations Review, Vol. 12, No. 4 (July 1959), 540-553. The only comprehensive national survey of occupational training needs can be found in: U.S. Department of Labor, Manpower Administration, Office of Manpower, Automation and Training, Formal Occupational Training of Adult Workers, Manpower/Automation Research Monograph No. 2, Washington, D.C.: U.S. Government Printing Office, 1964. An excellent interpretive summary of these data can be found in: Ann R. Miller, "Current Occupation and Past Training of Adult Workers," unpublished report prepared for the U.S. Bureau of the Budget, Sept. 1967 (mimeo.).
4. President's Message to Congress on Employment (New York Times, Jan. 24, 1968) and President's Message to Congress on Education (New York Times, Feb. 6, 1968).

5. U.S. Department of Commerce, Bureau of the Census, "Projections of the Population of the United States, by Age, Sex, and Color to 1990, with Extensions of Population by Age and Sex to 2015," Population Estimates, Current Population Reports, Series P-25, No. 381, Washington, D.C.: U.S. Government Printing Office, December 18, 1967.
6. U.S. Department of Commerce, Bureau of the Census, United States Census of Population 1960: California, General Social and Economic Characteristics, Final Report PC(1)-6C, Washington, D.C.: U.S. Government Printing Office, March 1962, Table 39, p. 6-232.
7. Note: The transition ratios were calculated for graded enrollment only from: State of California, Department of Education, Enrollment in California Public Schools, Fall 1966, Sacramento, 1967, and similar reporting for earlier years. In addition, the ungraded system, namely for physically handicapped, mentally retarded and special classes, accounted for between 50,000 and 70,000 pupils annually in California public schools.
8. The ratios of first-year acceptances to high-school graduates are from unpublished tabulations of the California Department of Finance, Revenue and Management Agency (Demographic Division, courtesy of Mr. Joseph Freitas). Actual statistics may be found in the annual reports of the California state colleges and the University of California. Further data are available in: State of California, California Statistical Abstract 1967, Sacramento, 1967, pp. 108-109; and State of California, Department of Finance, Projections of Enrollment for California's Institutions of Higher Education, 1960-1975, Sacramento, October 1960, passim.
9. State of California, Department of Education, Annual Descriptive Report for Vocational Education in California (1965-66), Sacramento, n.d. (mimeo.). Similar mimeographed reports are available for other years. Current information on manpower training and retraining (particularly under federal support auspices) is reported in: State of California, California Manpower Coordinating Committee, Cooperative Area Manpower Planning System, The California Cooperative Manpower Plan for Fiscal Year 1968, June 27, 1967.
10. In their studies researchers utilize standard techniques based upon the calculations and analysis of "matrices." A matrix is simply a table arranged in checkerboard form, in which one set of column headings (variables or parameters) is listed along the top of the table and another set of row headings (variables or parameters) is listed on the side of the table. Thus, every entry (value or magnitude) is listed in two ways, associating it with either column or row (respective variables or parameters). The Bureau of Labor Statistics matrices by occupation already assume existing production relationships between industries and the distribution of employment in each major industry sector by major (and/or detailed) occupation. The industry-occupation matrix thus takes

into account actual (and/or projected) input-output relationships and levels of economic activity. The education-occupation matrix thus takes into account actual (and/or projected) relationships of educational attainment by occupation. The technique employed in this study is the so-called "Method B" of projection employed by the Bureau of Labor Statistics (see details in: U.S. Department of Labor, Bureau of Labor Statistics, Tomorrow's Manpower Needs: National Manpower Projections and a Guide to Their Use as a Tool in Developing State and Area Manpower Projections, Washington, D.C.: U.S. Government Printing Office, 1967 (mimeo.), pp. 704-709), which is as follows:

1. California state occupation-industry and occupation-educational attainment matrix is developed (Table 12).
 2. U.S. national occupation-educational attainment trend factors (Table 11) are computed for each cell by dividing the projected (1975) occupation-educational attainment ratio by its corresponding (1960) occupational-educational attainment ratio. Note that for educational attainment, 1959 to 1966 trend ratios (Table 13 and Table 14) were used.
 3. The projected (1975) state matrix is computed by applying the derived national occupation-educational attainment trend factors to the corresponding state cell of the base period (Table 12).
 4. This procedure is repeated for each occupation-educational attainment cell, and the totals are forced on a pro-rated basis to 100 per cent distribution.
 5. Individual cell estimates are then aggregated for occupations and levels of educational attainment.
11. W. Lee Hansen and Burton A. Weisbrod, Benefits and Costs of Public Higher Education in California, A Report to the Joint Committee on Higher Education, California State Legislature, Nov. 15, 1967, p.V-2.
 12. National Planning Association, Center for Economic Projections, Regional Economic Projections Series: State Population, Labor Force and Net Migration Trends to 1976, Report No. 3, Washington, D.C., Nov. 1963 (mimeo.), p. 94. See similar data in: National Planning Association, Projections to the Years 1976 and 2000: Economic Growth, Population, Labor Force and Leisure, and Transportation, Washington, D.C., 1962, esp. pp. 42, 45-46. Statements in the text were derived on the basis of data from 1950 and 1960 Censuses of Population and labor force participation rates.

13. U.S. Department of Commerce, Bureau of the Census, 1960 Census of Population, Classified Index of Occupations and Industries, Washington, D.C.: U.S. Government Printing Office, 1960, passim.
14. State of California, Department of Employment, Department of Industrial Relations, Estimated Civilian Employment, Unemployment, and Labor Force, California 1940-1966, January 1967. This (and similar type) reporting of employment by industry sectors devoid of occupational information is of limited use, however, for projecting training requirements. For purposes of unemployment compensation or welfare benefits, the compilations of data by the California Department of Employment serve useful purposes, but for purposes of manpower planning (especially relating it to education), their statistical-gathering activities leave much to be desired.
15. U.S. Department of Labor, Bureau of Labor Statistics, Tomorrow's Manpower Needs: National Manpower Projections and a Guide to Their Use as a Tool in Developing State and Area Manpower Projections, Washington, D.C.: U.S. Government Printing Office, 1967. See also: U.S. Department of Labor, Manpower Report of the President and a Report on Manpower Requirements, Resources, Utilization and Training, transmitted to Congress in the respective years--1963, 1964, 1965, 1966, and 1967.
16. State of California, State and Local Fiscal Relationships in Public Education in California, Report of the Senate Fact Finding Committee on Revenue and Taxation, prepared by Charles S. Benson et al., Sacramento: Senate of the State of California, March, 1965, passim, esp. p. 25.
17. California Education Code (1963 edition), Article Section No. 17300.
18. Tabulation adapted from: State of California, Department of Finance, Financial and Population Research Section, Preliminary Projections of California Area and Counties to 1985, Special Report, Sacramento, April 20, 1967, pp. 44-45. This source also presents convenient California economic area map.
19. Photostats of "raw data" tabulated by county are available upon request from the author or by writing to Professor Charles S. Benson, School of Education, University of California, Berkeley, California.
20. According to the annual reports of Financial Transactions of California School Districts, "current expense of education" includes: administration, salaries of teachers and other personnel, surcharges on salaries, health services, transportation, operation of plant, maintenance of plant, fixed charges. "Current expense" excludes food service, community service, capital outlays, building loan payments, debt service charges, tuition and other trans-

fers. The categories thus included in "current expense" are largely those of the direct costs of education. If the real resource costs were to be estimated, loan payments and debt service charges should have been included, together with private costs of education and income foregone by students. The aggregation of totals for elementary school districts, high-school districts and unified school districts was derived for the "current expense" category for each county and subsequently summed up by economic area.

21. New York Times, Feb. 6, 1968, p. 26.

The following sources were used in compiling the data in the tables throughout this report:

State of California, Department of Finance, Revenue and Management Agency, California Population--1966, Sacramento, Oct. 1966.

State of California, Department of Education, Enrollment in California Public Schools--Fall 1966, Sacramento, 1967.

California Taxpayers' Association, "Parochial School Enrollment: California Counties as of September 1966," Jan. 1967 (mimeo.).

State of California, Department of Finance, Revenue and Management Agency, California Population Projections, 1965-2000, Sacramento, Mar. 1966.

State of California, Documents Section, California Statistical Abstract 1965, Sacramento, 1966.

U.S. Department of Commerce, Bureau of the Census, United States Census of Population 1960: California, General Social and Economic Characteristics, Final Report PC(1)-6C, Washington, D.C.: U.S. Government Printing Office, 1962.

U.S. Department of Commerce, Bureau of the Census, Current Population Reports: Population Characteristics, Series P-20, No. 91, Washington, D.C., Jan. 12, 1959.

U.S. Department of Commerce, Bureau of the Census, Current Population Reports: Population Estimates, Series P-25, No. 305, Washington, D.C., Apr. 14, 1965.

State of California, Department of Finance, Projections of Enrollment for California's Institutions of Higher Education, 1965-75, Sacramento, October 1960.

U.S. Department of Labor, Bureau of Labor Statistics, Tomorrow's Manpower Needs: National Manpower Projections and a Guide to Their Use as a Tool in Developing State and Area Manpower Projections, 1967.

U.S. Department of Labor, Bureau of Labor Statistics, Educational Attainment of Workers, 1959, Special Labor Force Report No. 1, reprinted from Monthly Labor Review, Feb. 1960, reprint No. 2333.

U.S. Department of Labor, Bureau of Labor Statistics, Educational Attainment of Workers, March 1966, Special Labor Force Report No. 83, reprinted from Monthly Labor Review, June 1967, reprint No. 2528.

State of California, Department of Education, Enrollment in California Public Schools, October 31, 1962, Sacramento, 1963.

State of California, Department of Education, Enrollment in California Public Schools, October 31, 1963, Sacramento, 1964.

State of California, Department of Finance, Graded Enrollment Data, Sacramento, August 1964.

State of California, Annual Report of Financial Transactions concerning School Districts of California, Fiscal Year 1964-65, Sacramento, 1965.

State of California, Department of Education, Enrollment in California Public Schools, October 31, 1964, Sacramento, Feb. 1965.

The author especially appreciates permission to use the unpublished materials of the California Department of Finance, Revenue and Management Agency, and particularly the courtesy of Mr. Walter Hollman and Mr. Joseph Freitas in making these materials available to the author and the State Committee on Public Education.

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