

COLLEGE OF DESIGN AND CONSTRUCTION
Bangkok, Thailand

by

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INTRODUCTION

Since the dawn of history education plays an important part in our society, in every nation all over the world. Man has learned how to survive under the uncertainty of the weather, how to work successfully in his occupation, how to express his emotions in literature, in art, in poetry, and how to organize himself in regard to social groups, so that co-operative effort may accomplish what the individual can not achieve alone.

This mass of human experience has been transmitted from generation to generation. This process of education has been related from the past to our modern society.

Vocational education has been a part of this total experience and has become more or less the intermediate education for distinctive social service in certain forms of the society.

Every nation's concept of the vocational education is based on the same roots. The difference of the vocational education of each nation is the demand of the social needs at a particular time.

In this report, the subject is described mainly on vocational education in Thailand. It is well understood that education is the basic need of all nations. By this fact, to educate Thai people is not only to build up manpower, but also to establish the economy, thus upgrading the living conditions of Thai people.

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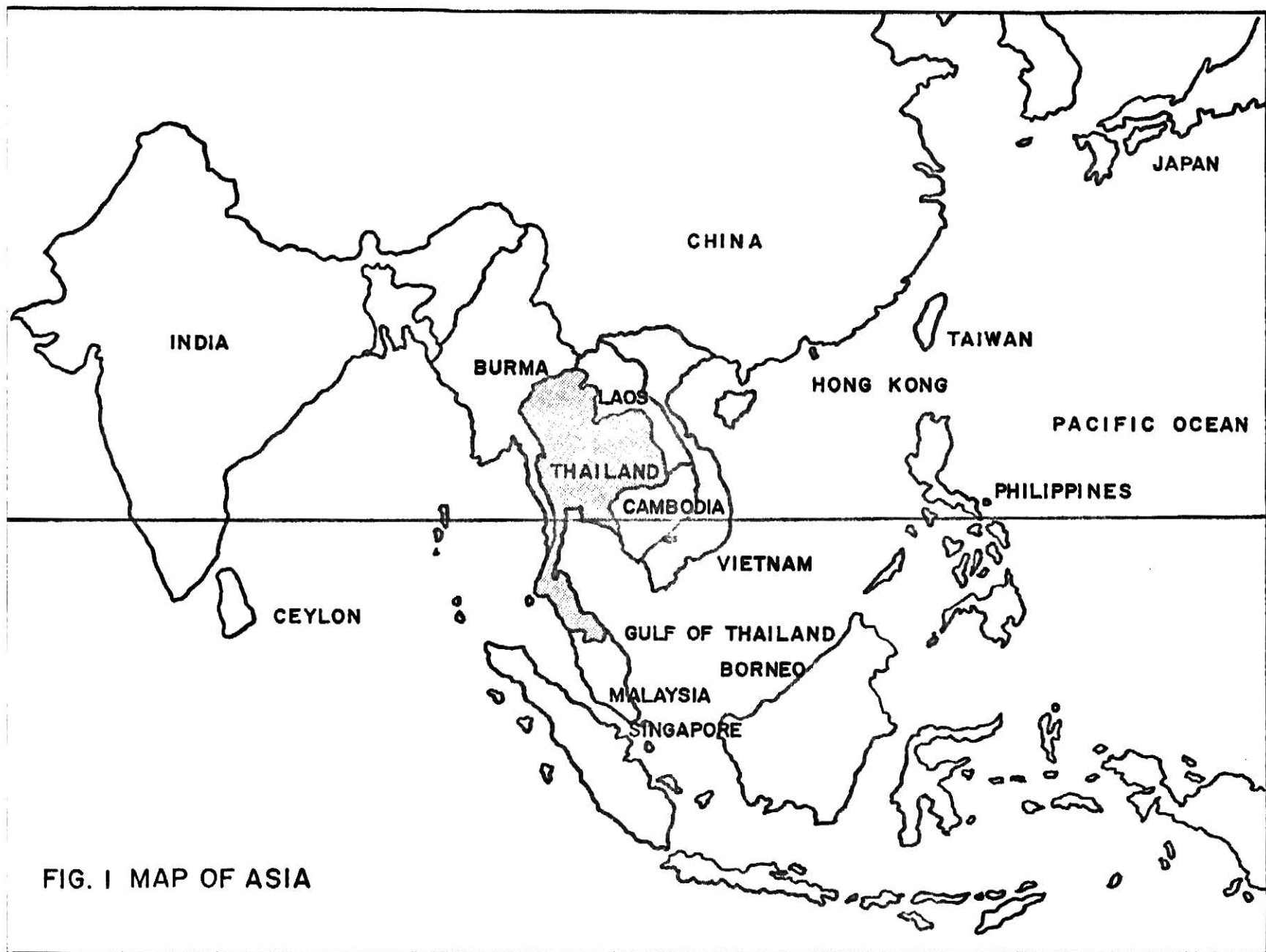


FIG. 1 MAP OF ASIA

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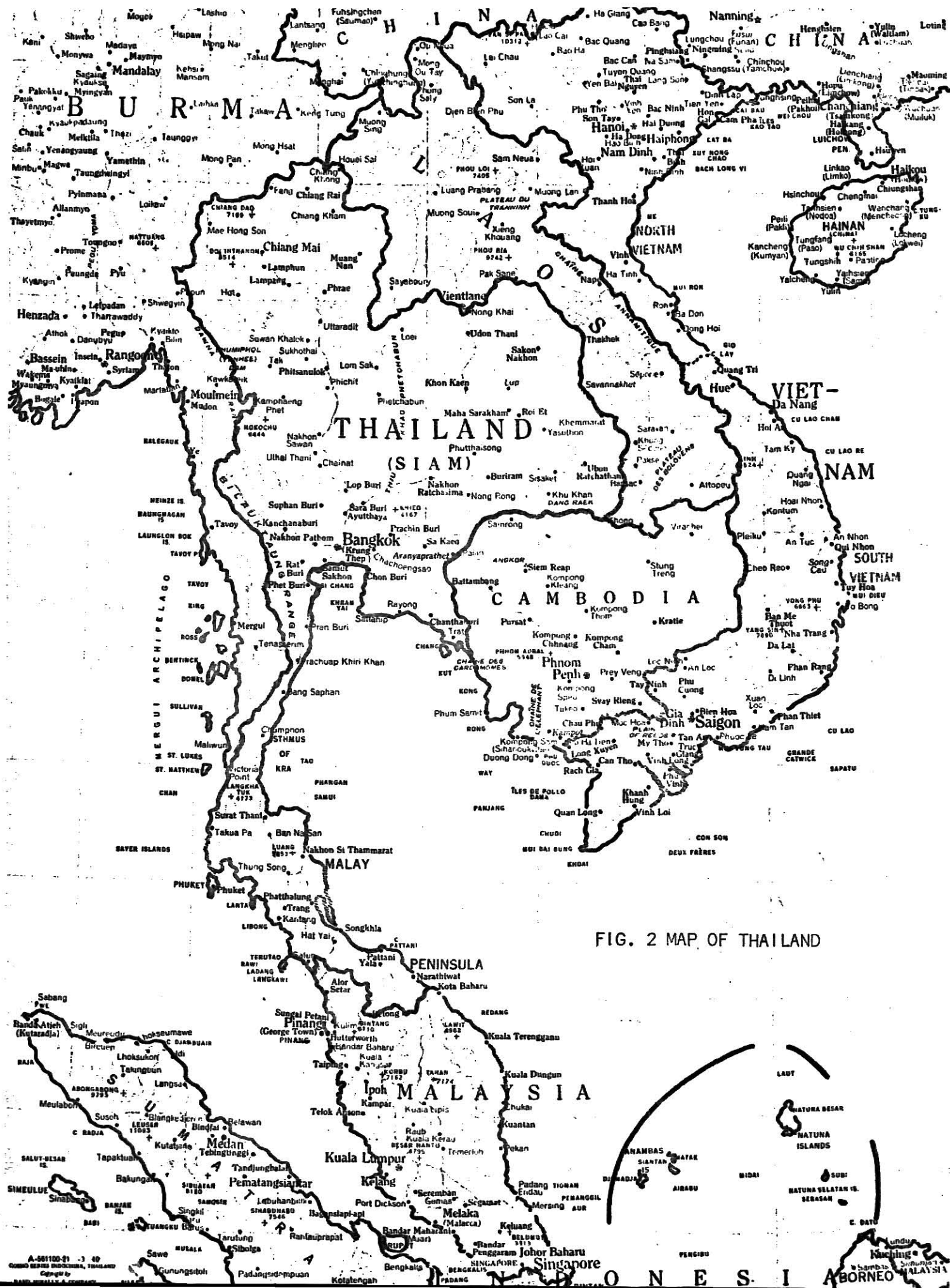


FIG. 2 MAP OF THAILAND

AN OUTLINE OF THAI HISTORY

In Thai language, the word "Thai" means free. The history of Thai nation which can be traced back to the seventh century proves that the name of the country is quite appropriate.

The history of Thai nation began with the homeland in the south of China and had to move southward to establish a new kingdom after being invaded several times by the Chinese Emperors in the middle of the twelfth century. Their movements were thus no different from those of the early settlers in the United States. About 1238 A.D. the first Thai Kingdom was founded in the Indo-China Peninsula. Records in history, as well as archaeological findings, prove that the Thai nation in the new kingdom "maintained and advanced their existing culture." The invention of the Thai alphabet which indicates the birth of education, international trade especially with India, China, and other neighboring countries and the growth in all forms of art.

At the same time that the War of Independence in the States was the loss, the Thai capitol was completely destroyed by the Burmese after four years of fighting. Thais had to move further southward to establish their new capitol - first on the west bank of Chao Phya River, and later on the east bank which is now Bangkok.

Religion

Buddhism has been well established in Thailand since the twelfth century, and has become an integral part of Thai culture.

Other religions were not active in Thailand until the Bangkok period when Thais had more contact with Americans.

The first group of American went to Thailand in 1828. They were missionaries. The most popular American in those days was Dr. Bradley of Boston, he was known to the Thai people as the foreigner who introduced Western medical practices, the printing and the newspaper services. Dr. Bradley devoted 45 years of his life to his work in Thailand. He died there in 1873.

Religions in Thais' view, are nothing but different roads leading to the same end, that is God. Thai people, therefore, see no sense in having prejudice against any other religions.

However, Buddhism has never even once suffered any ill fate in this country. It has had a profound influence over the Thai arts, culture, tradition, education, more important, it has dominated the character of the vast majority of Thai people. At present 93.55% of the whole population are Buddhists.

The Monarchy

One of the most significant and distinctive features of the Government of Thailand is the institution of the monarchy.

In the early period of Thai history, the Thais had to contend with the hostile neighbors in an effort to ensure national survival and independence. A leader was, therefore, needed to give communal unity and protection. It is natural that the concept of the King as was leader was broadened to include leadership in times of peace.

The relationship between the King and his people in the early days was on a patriarchal basis. The monarch was, of course, the leader of his people in battle, but in peace time he was regarded as the father of his people.

The tradition of kingship, originated and accumulated from the past and adapting itself to changing circumstances.

The long and cherished tradition of monarchy is part of Thai society. Thai people have always shown such deep respect and love for their kings. To them monarchy symbolises not merely royal power, prerogatives and tradition of kingship but an inbred national trait.

At present, the king is head of state and Commander - in Chief of the Armed Forces of the Kingdom. He appoints a prime minister and an appropriate number of ministers forming the council of ministers to exercise the executive power. The King holds also the prerogative of relieving ministers of their posts. The courts of law exercise the judicial power in the name of the King. Judges are independent in conducting trials and giving judgments in accordance with law.

GEOGRAPHICAL AND PHYSICAL BACKGROUND OF THAILAND

Thailand, one of the Southeast Asian countries, is situated in the Indochinese Peninsula. It is bounded on the north by China and Laos on the east by Cambodia, on the south by Malaysia and on the west by Burma.

The following estimated figures are dimensions of her size:

North Latitude	20°	30'	north
South Latitude	5°	40'	north
East Longitude	105°	45'	east
West Longitude	97°	30'	east
Area	518,000 square km.	198,247 square miles	
Widest part	750 km.	540 miles	
Longest part	1,620 km.	960 miles	

Regions

For convenience of description, Thailand may be divided into 5 physiographic regions, namely, the Northern Folded Mountains, the Central Plain, the Khorat Plateau, the Southeast and Peninsula.

The Northern Folded Mountains Region

This region consists of a series of parallel and longitudinal folded mountains in continuation of the Himalayan System, which runs down through the east of Assam in India, Yunan Province of China, Shan State of Burma, and further south through the Peninsula of Thailand and Malasia.

The average height of the peaks in this region is about 1,600 meters above mean sea level.

This northern folded mountain system extends down the western provinces of Tak and Kanchanaburi and ends there.

There are also many limestone hills in this region and they are easily identified by their precipitous features. Doi Chiang Dao, 2,182 meters high, one of the highest limestone mountains, is north of Chiang Mai.

The chief cities of this region are Chiang Mai, Lampang, Phrae and Nan.

The Khorat Plateau

The Khorat Plateau, named after the second name of Changwat Nakorn Ratchasima, consists of two-sided fault and tilt vaster than a uniform uplift of the strata of sedimentary rocks. The elevation of the tilted rim of the western side varies from 130 to 200 meters above mean sea level.

The southern tilt separates the plain of Cambodia from the plateau surface. Thus the two levels of land are traditionally called the Lower Cambodia and the upper Thailand. The rim of the plateau on this side averages about 400 meters above mean sea level.

Close to the point, where the border of Cambodia, Thailand, and Laos meet at the southeast corner of the plateau, the rim of the escarpment turns northeastward to join with the junction between Mekong River and Mae Nam River.

Because of the rolling topography of this region, the average pattern is rather dendrite with the general direction of flow toward southeast.

The great extent of the plateau consists of sandstone which is the prime material of the sandy soil found on the surface.

The chief cities of this region are Nakorn Ratchsima, Ubon, Petchabum.

The Central Plains

The Central Plain of Thailand may be divided into two distinct physio-graphic sub-provinces, the Northern Rolling Plain and the Chao Phya Delta.

The topography of the Northern Rolling Plain has been much dissected until its general surface has been leveled down much lower than the Northern Folded Mountains region; but it is still higher than the Chao Phya Delta. Three major rivers flow through this rolling plain, namely, Maeuam Ping with Maeuam Wang already united, Maenam Yom and Maenam Nau. All of these rivers join together at Pak Nam Pho to form Maenam Chao Phya.

The Chao Phya Delta commences south of Nakorn Sawan and extends down to the Gulf of Thailand. The triangular plain is traversed by two major rivers, Maenam Chao Phya and Maenam the Chin.

The flat land of the Chao Phya Delta is generally low and is usually flooded by rain water in the wet season, and thus is very useful for rice growing. Bangkok, on the east bank of Maenam Chao Phya, stands only 1.80 meters above mean sea level. The higher grounds close to the east and west sides of the delta plain must be aided by irrigation.

The Chao Phya Delta is the largest and most fertile plain of the country. The chief cities of this region are Bangkok, Thonburi, and Ayutthaya.

The Southeast

The Chief cities of this region are Chon Buri, Rayong and Chantaburi.

The southeast region is flanked on the east by a range of hills called Bauthat (the ruler), because when looking at a distance far enough the top of the range appears as a straight line. This mountain range forms part of the frontier between Cambodia and Thailand.

Because the mountains in this region are close to the sea, the coast line is therefore much indented and fringed with rocky islands. Ko Chang, the largest island on this coast, and Ko Kut are very well known among tourists for their beautiful beaches and landscape.

The Peninsula

The Peninsular covers an area from Ratchaburi to the southern border between Thailand and Malaysia. The general topography is from rolling to mountainous, with a small amount of flat land.

The southern portion commences from the Isthmus Koa and extends down to the Malaysian border.

The streams and rivers in the southern portion of the Peninsula are generally short and flow down to the sea on both sides.

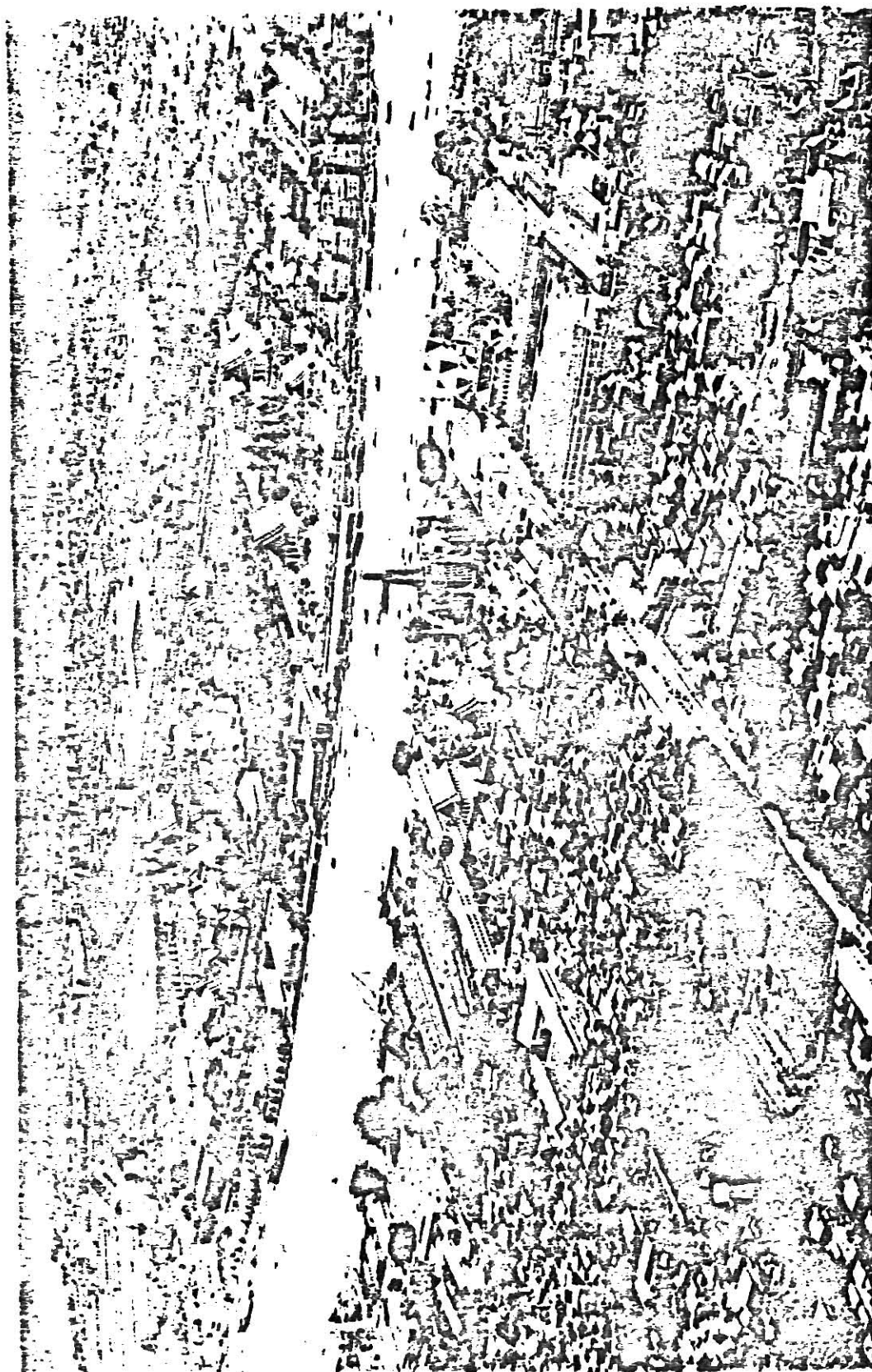
The chief cities of this region are Nakorn Si Thammarat, Chumpon and Surat.

"Bangkok," like London, has never been conquered; like Peking, she is the heart of civilization, like Stockholm, she does not care for brute strength, like Paris, she is always fun; and like Rome, she is a city of religion.

James Morris, Life International
Magazine (July 3, 1961)

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AN AERIAL VIEW OF THE CHAO PHYA RIVER AND THE
TWIN CITIES OF BANGKOK AND THON BURI. FIG. 3

Bangkok

Bangkok, the capital of Thailand, is located on the bank of Chao Phraya River which is the large main river in central Thailand. This river has many tributaries as the main drainages of the Northern Region and the Central plain.

Weather in Bangkok

Lat. $13^{\circ}45'$ - Alt. $40'$

Temp.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Low	67°	70°	73°	76°	76°	76°	76°	76°	75°	75°	71°	67°
High	92°	93°	95°	97°	95°	93°	92°	92°	91°	91°	89°	89°
Average	80°	82°	94°	87°	86°	85°	84°	84°	83°	83°	80°	78°
Days with No Rain	30	25	27	24	14	12	12	12	9	14	23	28

The city roads in Bangkok are more or less 1.80 metres above sea level. It is clear that the general gradients are practically flat in the vicinity of Bangkok.

General Characteristics of Bangkok

In Bangkok, there is a remarkable blending of the old and the new, of East and West. But it is the old Bangkok that makes this truly a different city of the Orient. Farmers paddle their boats loaded with exotic fruits through the canals to boisterous week-end markets.

Bangkok is forever changing. The ancient and marvelous Royal Chapel of the Emerald Buddha stands side by side with new and shining multi-storied office buildings.

Population

The population of Thailand is 34,738,000 by population census taken as of July 1, 1969.

The characteristics of Thai people can be mentioned by their customs, traditions, religious beliefs, social classes, pattern of living, ethnic groups, and occupation.

Generally Thai people have been brought up, generations after generations under the influence of national religion, Buddhism. They are very helpful and cooperative, generous, and hospitable. They do not want to hurt other people's feelings either in conversation or action. Those who were educated in western countries or well-educated at local universities will be modern and westernized in their outlook.

Climate

The main part of Thailand lies in the zone ranging from the southern part of Mexico down to Central America. It is part of the tropical monsoon climate zone.

This Kingdom, extends from 5° to 21° north latitude while in longitude it stretches from 97° to 106° E, with average temperatures of 85 F.

Thailand has three well-defined seasons; March, April and May constitute the "hot season", the rainy season, June through October, with refreshing monsoon showers is a delightful season; and November through February is the "cool season".

Thailand's yearly rainfall is 45 to 55 inches over most of the country.

The yearly average humidity of Thailand varies little; it is between 75% to 85%.

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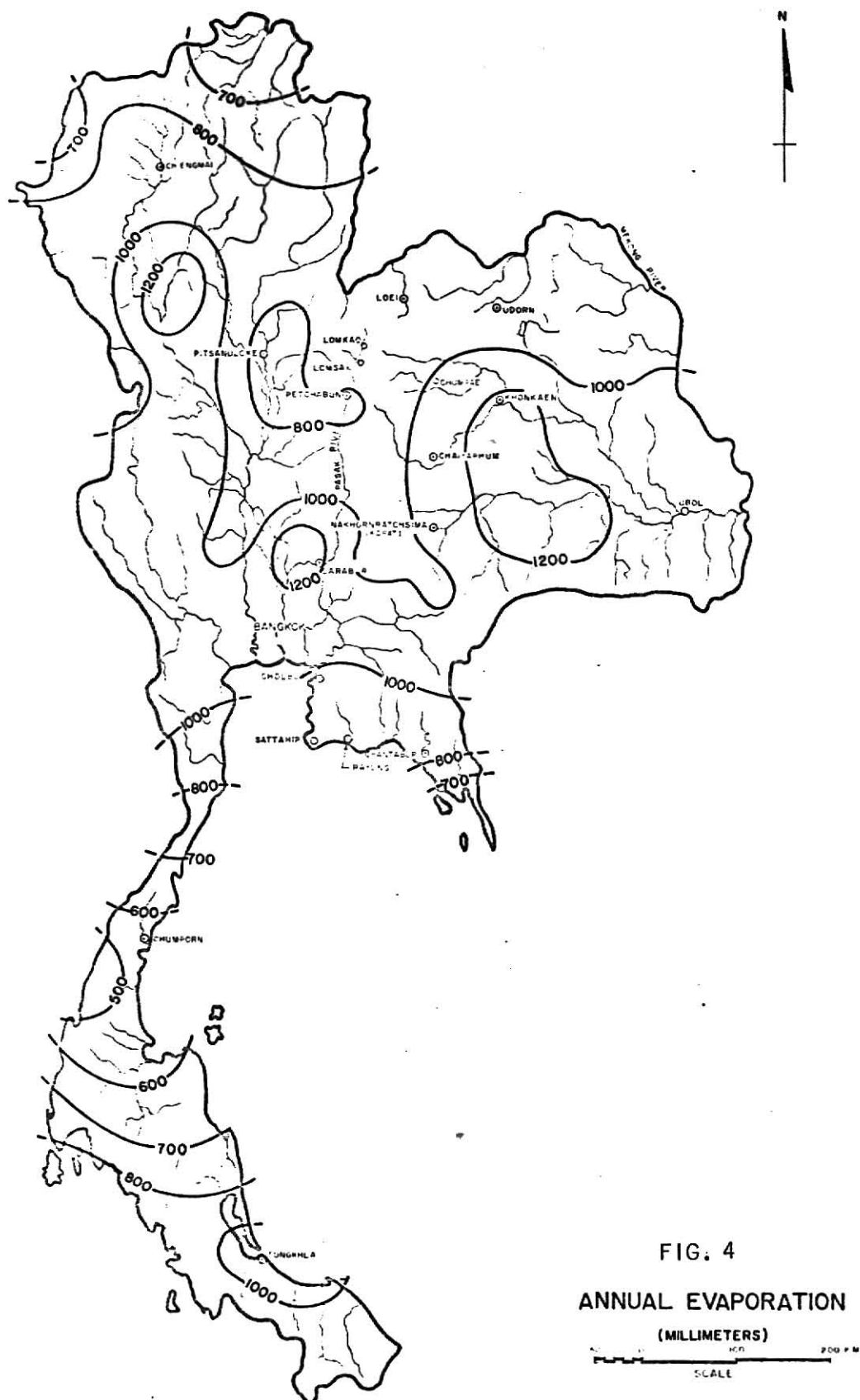


FIG. 4
ANNUAL EVAPORATION
(MILLIMETERS)

SCALE 0 100 200 KM

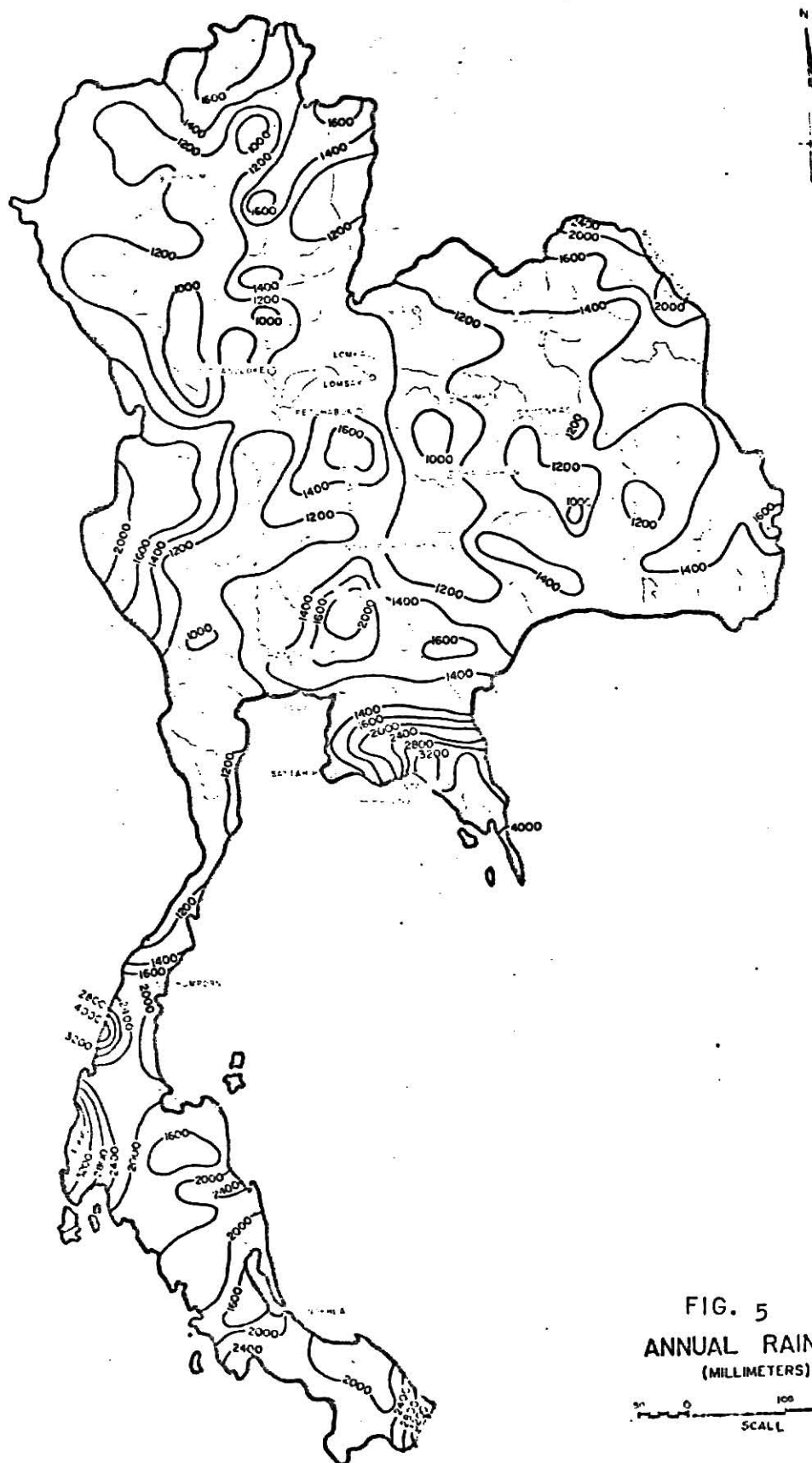
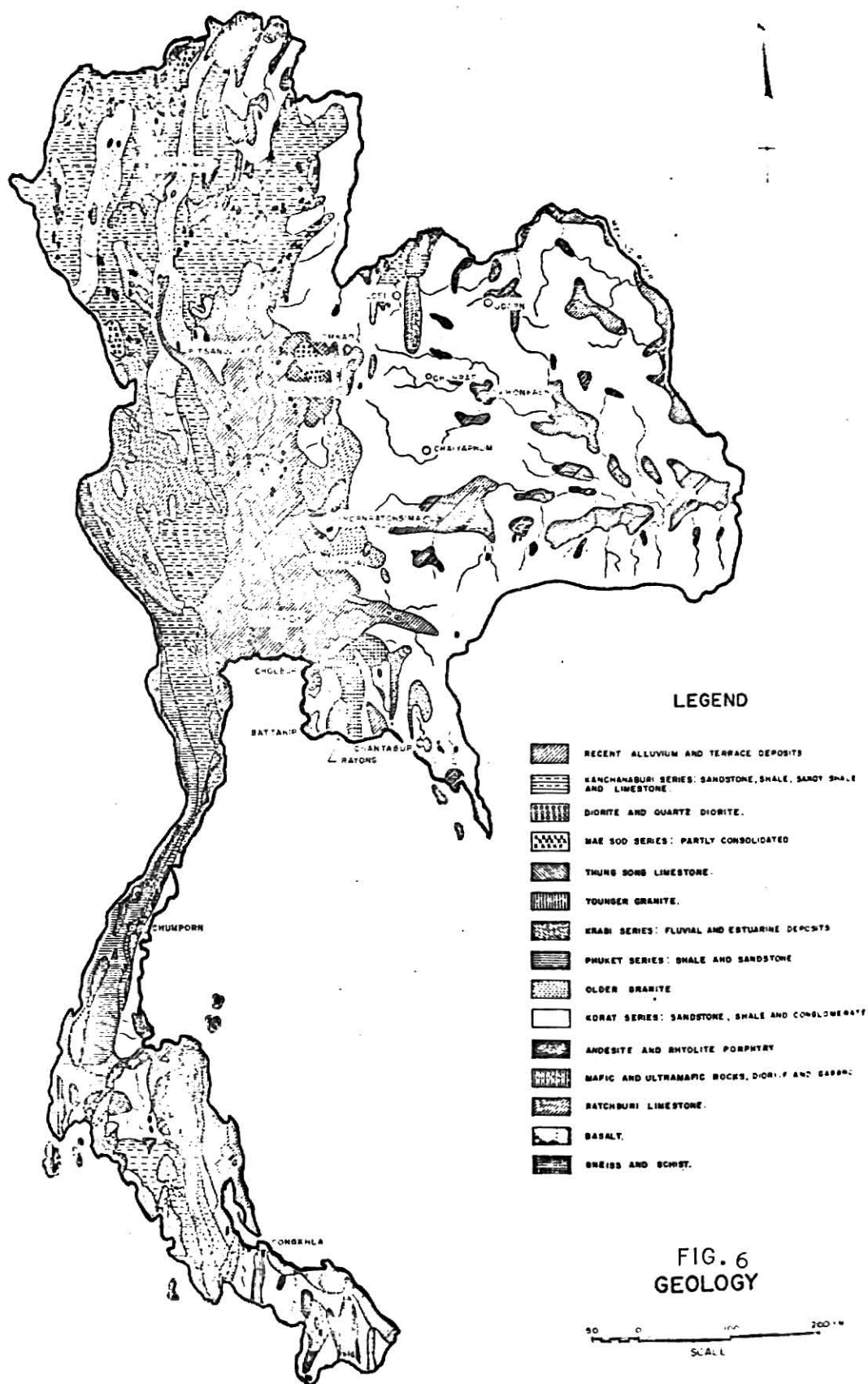


FIG. 5
ANNUAL RAINFALL
(MILLIMETERS)



AIR TEMPERATURE AND NEBULOSITY : 1966 - 1967 TABLE I

เดือน Month	อุณหภูมิของอากาศในร่ม (°ซ) Air temperature in shade (°C)						มฆิมแห่ง กลุ่มเมฆ Mean nebulosity (0-8)			อุณหภูมิของอากาศในร่ม (°ซ) Air temperature in shade (°C)						มฆิมแห่ง กลุ่มเมฆ Mean nebulosity (0-8)			
	รายเดือน Monthly mean	พิสัยรายวัน Mn. daily range	สูงสุด Extreme high	ต่ำสุด Extreme low	ค่าสุด Extreme low	ค่าสุด Extreme high	รายเดือน Monthly mean	พิสัยรายวัน Mn. daily range	สูงสุด Extreme high	ต่ำสุด Extreme low	ค่าสุด Extreme low	ค่าสุด Extreme high	รายเดือน Monthly mean	พิสัยรายวัน Mn. daily range	สูงสุด Extreme high	ต่ำสุด Extreme low			
มกราคม	27.7	25.6	10.7	10.2	34.6	33.6	16.6	12.9	5.1	27.2	24.5	12.2	08.4	35.0	33.5	15.0	13.1	3.8	5.4
กุมภาพันธ์	28.7	27.6	09.2	10.3	36.6	36.0	22.4	18.6	5.3	27.7	26.9	10.3	10.8	34.7	35.5	20.4	19.8	5.1	4.5
มีนาคม	30.3	29.2	09.7	09.7	37.4	36.6	22.6	20.7	4.5	28.3	27.6	10.3	10.1	35.2	35.0	22.0	20.0	4.8	4.3
เมษายน	31.0	30.0	09.6	09.7	38.0	37.3	22.3	20.5	6.0	29.0	27.9	09.7	10.1	34.8	35.0	22.5	19.3	5.5	4.7
พฤษภาคม	29.4	29.4	08.2	08.0	38.5	37.9	23.6	24.0	7.3	27.7	28.1	06.8	08.0	35.1	34.5	22.5	23.0	7.1	6.3
มิถุนายน	29.0	29.7	08.1	07.8	35.3	35.0	22.2	23.5	7.1	27.8	28.0	07.3	06.3	35.3	33.0	22.5	22.7	6.9	6.7
กรกฎาคม	28.8	29.0	07.4	07.3	35.1	35.4	23.0	22.7	7.4	27.4	27.4	06.1	06.4	34.0	33.0	22.5	22.6	7.3	7.0
สิงหาคม	28.5	28.7	07.1	07.1	34.4	34.4	23.2	24.2	7.6	27.0	27.3	06.1	04.8	32.7	31.4	22.2	22.9	7.3	7.5
กันยายน	28.3	28.8	07.3	07.0	33.7	34.8	22.8	23.5	7.0	27.3	27.0	07.5	06.6	34.3	31.8	22.3	21.5	6.8	7.0
ตุลาคม	28.6	27.8	07.6	06.8	34.2	33.3	23.1	20.8	6.6	27.8	26.6	09.0	07.7	34.6	32.1	22.2	20.4	6.3	5.9
พฤศจิกายน	28.0	27.8	08.1	08.0	33.7	33.5	21.4	21.9	5.0	27.0	26.9	09.7	09.6	34.5	32.5	20.0	19.2	4.8	3.9
ธันวาคม	27.6	25.6	09.2	10.8	34.8	33.6	17.8	16.7	6.2	26.4	24.8	09.0	11.4	34.0	33.1	17.4	16.3	5.2	2.7
Mean annual	28.8	28.3	08.5	08.6	35.5	35.1	21.7	20.8	6.3	27.6	28.8	08.7	08.3	34.5	32.5	21.0	20.1	5.9	5.5
จังหวัดสุราษฎร์ธานี Aranyaprathet Lat. 13° 42' N Long. 102° 35' E																			
มกราคม	29.3	26.8	11.6	11.5	37.6	36.5	18.2	14.1	5.0	27.0	24.2	13.7	11.2	36.4	36.6	12.7	10.2	3.0	4.4
กุมภาพันธ์	29.8	28.9	09.7	10.8	37.6	37.7	22.5	20.7	5.7	28.7	27.1	12.4	13.7	37.0	37.4	19.3	15.2	4.0	3.5
มีนาคม	31.1	29.1	09.8	07.5	37.9	36.2	22.6	21.8	5.4	30.2	29.6	12.5	13.5	38.6	39.7	21.4	19.1	4.4	3.4
เมษายน	31.8	29.7	08.6	06.7	37.8	34.7	24.0	21.7	5.5	30.8	30.0	11.5	12.7	39.9	39.5	22.5	21.7	4.3	4.7
พฤษภาคม	29.1	28.9	07.3	05.5	36.5	34.3	22.3	22.2	7.0	29.0	29.4	07.9	09.3	38.0	37.5	22.7	23.0	6.2	6.0
มิถุนายน	29.5	29.2	06.2	04.5	34.5	33.0	22.7	23.5	6.6	29.1	29.3	08.6	09.3	35.0	35.4	23.0	23.4	5.5	5.7
กรกฎาคม	28.9	28.8	06.9	05.4	34.8	35.0	21.4	22.3	7.2	28.2	28.0	08.6	09.2	34.5	34.8	21.5	22.0	6.4	6.5
สิงหาคม	29.6	28.7	07.5	04.3	35.5	33.7	23.1	24.9	7.1	28.0	27.4	08.7	07.3	34.0	32.9	21.9	22.0	6.8	6.9
กันยายน	28.3	28.8	07.7	06.1	35.7	34.3	20.5	23.0	6.8	27.3	27.8	08.2	06.0	33.5	33.6	21.5	22.1	6.2	6.4
ตุลาคม	28.2	27.1	06.3	07.2	35.7	33.4	21.7	20.0	6.5	27.6	26.9	08.7	08.5	34.8	33.3	21.2	18.8	5.9	5.1
พฤศจิกายน	28.3	27.9	10.9	09.4	36.0	34.8	20.9	21.5	5.1	26.2	26.4	10.3	10.9	33.5	34.3	17.9	18.8	4.3	3.8
ธันวาคม	28.1	26.7	10.5	11.8	36.5	34.9	17.1	17.3	5.5	26.1	23.3	10.1	13.6	35.0	32.9	16.2	12.0	4.6	2.5
Mean annual	29.3	28.4	08.8	07.6	36.3	34.9	21.4	21.1	6.2	28.2	27.4	10.1	10.6	35.8	35.7	20.2	19.0	5.1	4.9

NATIONAL ECONOMY

General Characteristics

Thai economy can be regarded as a free enterprise economy. Agriculture is the backbone of the national economy and agricultural products are the main exports of Thailand. However, since the second world war, the world has been in the throes of great upheavals marked by economic chaos and world strife. Therefore, Thai Government has found it necessary to take an increasingly active role in the economic development of the country. Thai economy was no longer a monoculture economy based mainly on agriculture. The growth of national economy has also been accompanied by significant structural changes as a result of the increasing share of the gross domestic product originating from non-agriculture sectors, namely, manufacturing, construction, power, trade, and services.

The first economic development plan was proclaimed, covering the period from 1961 to 1966. Since the launching of the first plan, the structure of Thai economy has changed considerably for the better. The gross national product increased from 55,717 million baht in 1960 to 81,274 million baht in 1965 and 96,802 million baht in 1966.

It is expected that the average annual growth in 1966 for the second five-year economic and social development plan (1967-1971), proclaimed on October 1, 1966 will be as high as 8.5 percent.

HISTORICAL BACKGROUND OF VOCATIONAL EDUCATION IN THAILAND

DEVELOPMENT OF VOCATIONAL EDUCATION IN THAILAND

Vocational education, in the sense of formal education for occupational training, was not established in Thailand prior to 1898. The training in techniques and skills in the past took the form of apprenticeship.

Thai boys and girls in the old days did not take up vocational training serious until they reached adolescence. They soon learned through observing, imitating and participating. Perfection of techniques and skills resulted from repeated imitation. Specialized training was based on a division of work between the sexes: boys were trained mainly in trades and handicrafts; girls in homecrafts.

The system of vocation training remained in this pattern for centuries.

The needs for vocational education was not recognized until the end of the nineteenth century when the Government concentrated on systematizing the public services. New departments were introduced, thus the need for trained personnel became urgent. Therefore, several departments organized their specialized training units to serve their specific needs for trained personnel.

There were the Teachers' training school under the Department of Education, the Medicine School under the Department of Health, the Law School under the Department of Justice, and the School of Land Surveying under the Department of Survey. Parallel with the establishment of

secondary industries, was the expansion of tertiary industry in the field of banking, transport services and other related activities.

In the area of agriculture, training is needed in modern farm techniques. All this combined created the task for the Department of Vocational Education to prepare the train manpower particularly in the fields of agriculture, trades and industries. This is a tremendous task. According to the forecast made by the Manpower Planning Office, National Development Board, about 1,985,000 semi-skilled workers and 770,000 skilled workers are demanded during the period from 1960-1971. As it has been, the chronic and severe lack of funds has restricted us in expanding vocational education facilities as well as in improving our existing schools.

Recognizing the pressing and massive need for the expansion and the improvement of vocational training, the Government places vocational education high on the list of priority. This policy is reflected in the 1968 budget allocation for the Vocational Education Department. The sum of 417,421,400 baht (\$20,871,070) out of the Ministry's 1,350,170,500 baht (\$67,508,525) is allotted to vocational education.

Under the 1932 Scheme, Vocational courses were offered at three levels: after the fourth year of primary schooling; after the third year of secondary schooling; and after the sixth year of secondary schooling. The range of course was enlarged. Educational facilities were extended to the establishment of the Department of Vocational Education within the Ministry in 1941 to administer all vocational education schools.

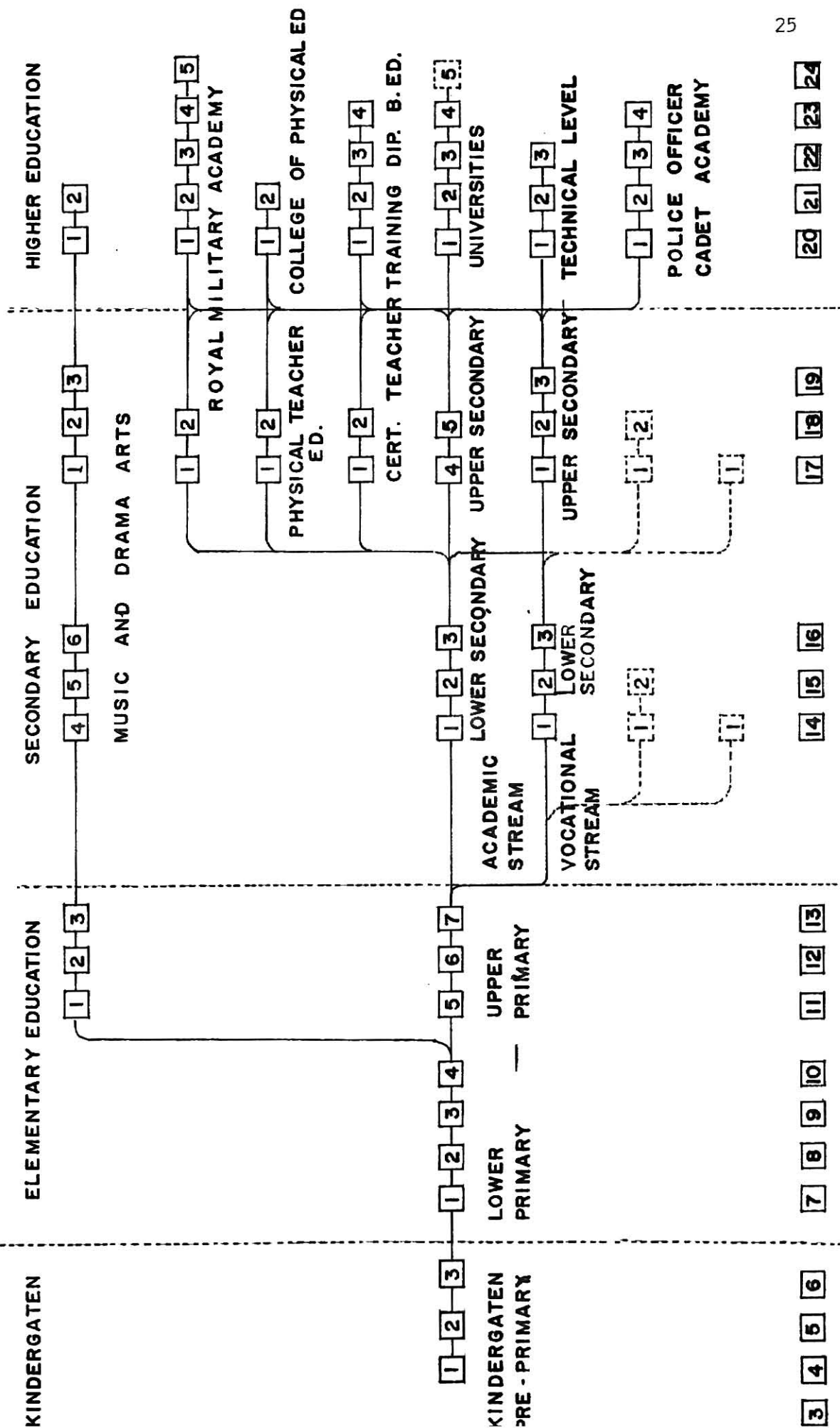
Under the 1960 Scheme, vocational education branches out at three levels: at Post-Primary Level; at the Lower Vocational Education Level, and at the Upper Vocational Education Level.

It can be summed up here that in the current setting, Thailand, since the post-war years has been trying to change its economy. This trend can be traced in the stress placed upon agricultural productivity the diversification and expansion of secondary and tertiary industries by encouraging the establishment of new industries and modernizing the existing ones.

The Industrial Promotion Act and the Promotion Industrial Investment Act have been introduced to serve this policy of the Government and have led to foreign investment in such secondary industries as pharmaceutical products, iron foundry, weaving mills, tanneries, so on and so forth.

There has been a marked increase between the allocation for vocational education in 1966 and 1968 that in 1968 from 115 million baht to 417 million baht, an increase of nearly 263 per cent. It is the first time that this Department has gotten the highest vote.

FIG. 7. ARTICULATION CHART OF THE SCHOOL SYSTEM BY LEVEL AND TYPE OR COURSE



ENROLLMENT AND TEACHERS IN VOCATIONAL INSTITUTIONS, BY SEX AND LEVEL OF EDUCATION: 1966-1967.

TABLE 3

ระดับการศึกษา	2509 (1966)			2510 (1967)			Level of Education
	รวม Total	ชาย Male	หญิง Female	รวม Total	ชาย Male	หญิง Female	
จำนวนนักเรียนทั้งหมด	52,753	34,162	18,591	59,653	37,721	21,932	Students Enrolled, Total
หลักสูตรระยะสั้น	4,104	2,179	1,925	4,760	2,413	2,347	Short - Course
มัธยมศึกษาสายอาชีพตอนต้น ^{1/}	4,815	3,312	1,503	6,471	4,154	2,317	Lower Vocational Secondary ^{1/}
มัธยมศึกษาสายอาชีพตอนปลาย	37,262	23,872	13,390	40,541	25,622	14,919	Upper Vocational Secondary
วิชาชีพชั้นสูงหลักสูตร 1 ปี	—	—	—	100	80	20	Technical 1 year Course
วิชาชีพชั้นสูงหลักสูตร 2 ปี	2,565	1,913	652	3,418	2,433	985	Technical 2 year Course
วิชาชีพชั้นสูงหลักสูตร 3 ปี	2,705	2,145	560	2,461	1,873	588	Technical 3 year Course
ฝึกหัดครูประถม	541	243	298	764	397	367	Elementary Teacher Training ^{2/}
ฝึกหัดครูมัธยม ^{2/}	761	498	263	1,138	749	389	Secondary Teacher Training ^{2/}
จำนวนครูทั้งหมด	5,670	5,585	2,085	5,796	3,635	2,161	Teachers, Total

ที่มาแห่งข้อมูลสถิติ : รายงานสำมะโนโรงเรียนและครู พ.ศ. 2509 และ 2510 สำนักงานสถิติแห่งชาติ สำนักนายกรัฐมนตรี

Source : Final Report, School and Teacher Census 1966 and 1967 National Statistical Office, Office of the Prime Minister.

^{1/} ไม่รวม 3 ปี แรกของหลักสูตรปี กรมศิลปากร

Excludes students of the first three years of preliminary Course in school of Dramatic and Fine Arts, Department of Fine Arts.

^{2/} รวมฝึกหัดครูมัธยมของวิทยาลัยเทคนิค

Includes 2 years Course student in Technical College.

**EXAMINATION RESULTS FOR VOCATIONAL STUDENTS IN SPECIFIC GRADES
IN ACADEMIC YEAR 1965-1966. TABLE 4**

ปีการศึกษา ชั้นเรียน	จำนวนนักเรียน Enrollment	เข้าสอบ Examinees	สอบได้ Passed		Academic Year, Level of Education
			จำนวน ผู้สอบได้ Number	เป็นส่วนร้อย ของผู้เข้าสอบ Percentage of Examinees	
ปีการศึกษา 2508 Academic Year 1965					
ยอดรวม	10,098	10,028	9,625	96.0	Total
มัธยมศึกษาสายอาชีพตอนต้น ปีที่ 3	1,051	1,046	1,002	95.8	Lower Vocational Secondary Third Year
มัธยมศึกษาสายอาชีพตอนปลาย ปีที่ 3	6,966	6,921	6,744	97.4	Upper Vocational Secondary Third Year
วิชาชีพชั้นสูงหลักสูตร 2 ปี ปีที่ 2	851	830	681	82.0	Technical 2 Year Course Second Year
วิชาชีพชั้นสูงหลักสูตร 3 ปี ปีที่ 3	764	764	753	98.6	Technical 3 Year Course Third Year
ฝึกหัดครูประถม ปีที่ 3	160	160	149	93.1	Elementary Teacher Training Third Year
ฝึกหัดครูมัธยม ^{1/} ปีที่ 2	306	305	296	97.0	Secondary Teacher Training ^{1/} Second Year
ปีการศึกษา 2509 Academic Year 1966					
ยอดรวม	13,671	18,518	18,311	98.3	Total
หลักสูตรระยะสั้น	4,028	4,028	4,028	100.0	Short Courses
มัธยมศึกษาสายอาชีพตอนต้น ปีที่ 3	1,225	1,191	1,172	98.4	Lower Vocational Secondary Third Year
มัธยมศึกษาสายอาชีพตอนปลาย ปีที่ 3	7,430	7,345	7,260	98.8	Upper Vocational Secondary Third Year
วิชาชีพชั้นสูงหลักสูตร 2 ปี ปีที่ 2	383	381	365	95.8	Technical 2 Year Course Second Year
วิชาชีพชั้นสูงหลักสูตร 3 ปี ปีที่ 3	279	279	176	63.1	Technical 3 Year Course Third Year
ฝึกหัดครูประถม ปีที่ 3	168	166	166	100.0	Elementary Teacher Training Third Year
ฝึกหัดครูมัธยม ^{1/} ปีที่ 2	158	158	144	91.1	Secondary Teacher Training ^{1/} Second Year

^{1/} ฝึกหัดครูมัธยมของวิทยาลัยเทคนิคไว้ด้วย

Including Diploma level in Technical College.

ที่มาแห่งข้อมูลสถิติ : รายงานผลสัมฤทธิ์ ผ่านโรงเรียนและครู พ.ศ. 2509 และ 2510 สำนักงานสถิติแห่งชาติ สำนักนายกรัฐมนตรี
Source : Final Report, school and Teacher Census 1966 and 1967 National Statistical Office, Office of The Prime Minister.

APPRAISAL OF THE DEVELOPMENT OF VOCATIONAL EDUCATION

Consideration of the needs of the present

There never was a time in which the quality of the individual citizen was of greater importance to the nation than the present. The increasing complexity of the world we live in, the fears and anxieties accompanying insecurity of outlook all place heavy premiums on the development of individuals with the toughness of fibre and sincere devotion to our way of life. Thailand, as a small country in the world of tomorrow will depend not upon the increasing number of population but upon the ability of our society to produce citizens of high quality.

Consideration for the future

If the school teaches only a few facts, and the fundamental skills of communication, it is a "surface education". This kind of education is no longer satisfactory. According to Mort and Vincent, they have to dig into the second level, which is the level of talent development. Better schools assess the tremendous differences in students' ability, background, talents and needs and they build far wider horizons in every area of human experience and understanding. They introduce into the life of the youngster those experiences which will make him individually fitted for the kind of life his native endowments have equipped him to lead.

Scope of vocational education

The vocational education will receive even greater expansion in the future and spread out into the community, including in the educational designs experiences for students in local business and industry, in home and garden, on the farm and in the forest. For the modern vocational school is a rich place to develop character, citizenship, work competence, and the tools of common sense.

Purpose and Goals

Training in citizenship, developing the ability to think, aiding children to learn to get along with others, developing in children bodies and minds, developing good character, providing students with tools of learning so that skills can be acquired in later life, gaining of knowledge, learning to use leisure time profitably; these are among the tasks set for vocational schools. And these are simple but great goals, related basically and representing two facets of our way of life --the individual's responsibilities to society and society's responsibility to the individual.

Curriculum

To design effective vocational education curricula is not a simple matter. Nor is there in existence an official, standardized procedure for guiding the process. A good curriculum is the result of dedicated and intelligent work on a continuing basis.

Effective curriculum planning requires that certain fundamental considerations be worked out as a base on which specific details may be added later.

(a) Philosophical Base

One of those initial considerations will involve philosophical justifications at least to the extent of identifying the educational goals sought. The vocational educator does not have to be a philosopher to engage in curriculum planning, but his plans must be philosophically sound. Such philosophical considerations will involve the exploration of various points of view such as those expressed by the idealist, the realist, or the pragmatist. The practical vocational educator may satisfy himself by systematically attempting to identify clearly and concisely the educational goals which may be considered feasible for the program being planned.

(b) Psychological Base

Psychological considerations in curriculum planning can become exceedingly complex, but to ignore them is to invite conflicts and wasted effort.

Another preliminary consideration leading to effective curriculum planning is the psychological foundations of curriculum design. The impact of the student's socioeconomic background, individual differences, motivational factors, environmental factors, individual needs, conflicting interests, and many other influences which bear on student learning must be carefully investigated as they affect curriculum design.

(c) Socioeconomic factors

Another basic consideration will involve the socioeconomic characteristics and needs of the geographic area in which the proposed curriculum is supposed to operate. Vocational educators have become quite adept at community surveys, and the potential usefulness should not be overlooked here. Curriculum planners should be sure, however, that surveys used reveal the necessary facts upon which to prescribe an educational program.

A STUDY OF LARDKRABANG AREA, BANGKOK, THAILAND

Geographical Background

The hard crust dark grey surface soil is characteristic as is typical of top soil in Bangkok area. The bearing value of the top soil is rather low, according to the Bangkok Municipal Code its bearing capacity is 2 tons/sq.m.

In Pahol Yotin, Sukhumvit and Lardkrabang districts, the fill materials are usually paddy clay or fine clayey sand varies in thickness from 0.30 to 1.20 metres. The surfacing fill rarely have an influence on foundation design.

Economic Background

Recognizing the pressing and massive need for the expansion and the improvement of vocational education, Thai Government places vocational education high on the list of priority. The sum of \$20,871,070 out of the Ministry' \$67,508,525 is allotted to vocational education.

The project at new land-grant site, Lardkrabang, Bangkok, approximately 85 acres in distance is 42 kilometres from the present location. With the budget of \$3,000,000 it will be completed at the end of 1974, with facilities to accommodates 1000 students.

Traffic and Transportation

There are three major traffic and transportation routes to Lardkrabang district. Students and faculties may make train connections from Bangkok station to Lardkrabang. It will take about 45 minutes to go by train, and it will take one hour to go by bus. For those who live in Pratue Nam area, it will take only half an hour to go by boat.

Factors Affecting Design

Climate

Bangkok, the capitol of Thailand, is situated in the central plain region. Generally, the weather is warm and humid during the day. The continual heat is moderated by the cooling inland breezes which occur during the evening. The temperature varies between 70 and 80 F throughout the year.

Prevailing Winds

Thailand is influenced by two seasonal winds, the Northeast and the Southwest Monsoons. The Northeast Monsoons, which come across the China Sea and the Gulf of Tan Kin, are the strongest winds. These winds prevail from October to February. The Southwest Monsoons prevail from March to September. They bring with them gentler winds and the heavier rainfall.

Consequently, buildings are usually oriented to the south to catch maximum breezes and to provide cross ventilation.

Solar Angles

Solar altitude is the vertical angle between the horizontal plane and a line from the sun.

Solar Altitude in summer is $90^{\circ} - \text{latitude} - 23\frac{1}{2}^{\circ}$

Solar Altitude in winter is $90^{\circ} + \text{latitude} - 23\frac{1}{2}^{\circ}$

Building Materials

Concrete and Cement Products

The material used for concrete are cement, aggregates, water, reinforcement steel, binding wire, form materials and nails.

The cement may be Portland cement, finely ground Super cement for high - early - strength concrete and prestressed concrete, or Elephant cement for high - class reinforced concrete.

In Thailand, Portland cement (Super cement and Elephant cement) is made by The Siam Cement Co., Ltd.

Thailand's many hardwoods make excellent formwork material but with the steadily rising prices of timber and also due to the ever increasing carpenter's wages, the merits of other formwork materials must be carefully examined, and it may often be found that specially treated plywood boards which can be used and reused many times will give cheaper forms than ordinary timber.

Wood

Wood is the general building material being used in Southeast Asia because of the many huge areas of evergreen forests. Woods are divided into three grades by quality.

Teak is the most valuable timber; it has the highest quality among the preferred kinds of woods. It has a long grain and the texture is smooth and fine. It rarely shrinks after having been seasoned and is highly resistant to termites. This is one of the factors for its being preferred to other distinguished woods. For these reasons, instead of being used for construction work, it is now being used only for furniture and finishing work.

Redwood is one of the finest timbers; it is grade B. It also has long grain and beautiful color. It is used for interior construction members such as beams, floors and ceiling.

Yang and Tabak woods are in grade C, which is the lowest quality among the wood used in Thailand.

Bricks

These materials have been used in Thailand for a thousand years. The standard size is small: 10" long, 5" wide, and 1 1/2-2" thick. Bricks are made of soil and clay combined with a chemical solution and then baked. There are two kinds of bricks in Thailand.

1. B.B.T. (Bang-Boa-Tong) are the initials of the place where the brick is made. They are the best among the bricks because they can stand much pressure. They have a beautiful color and fine texture. The principle use is for decorative exterior walls.
2. Morn Bricks are made from low quality soil, mixed with clay, with inferior workmanship. They are used for light construction work such as fences, walking paths, and one story walls covered with plaster.

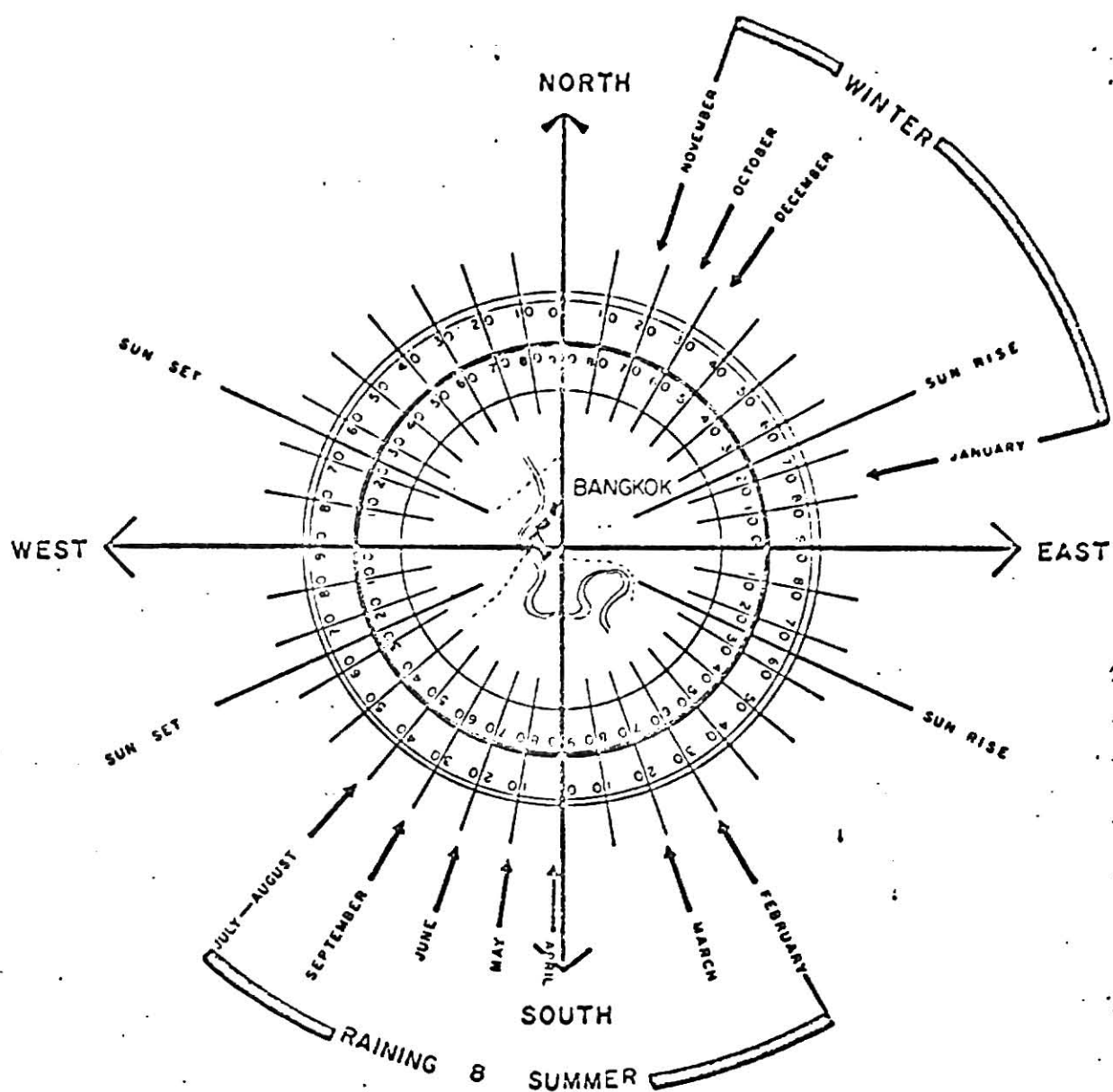


FIG. 9

WIND CHART OF THAILAND

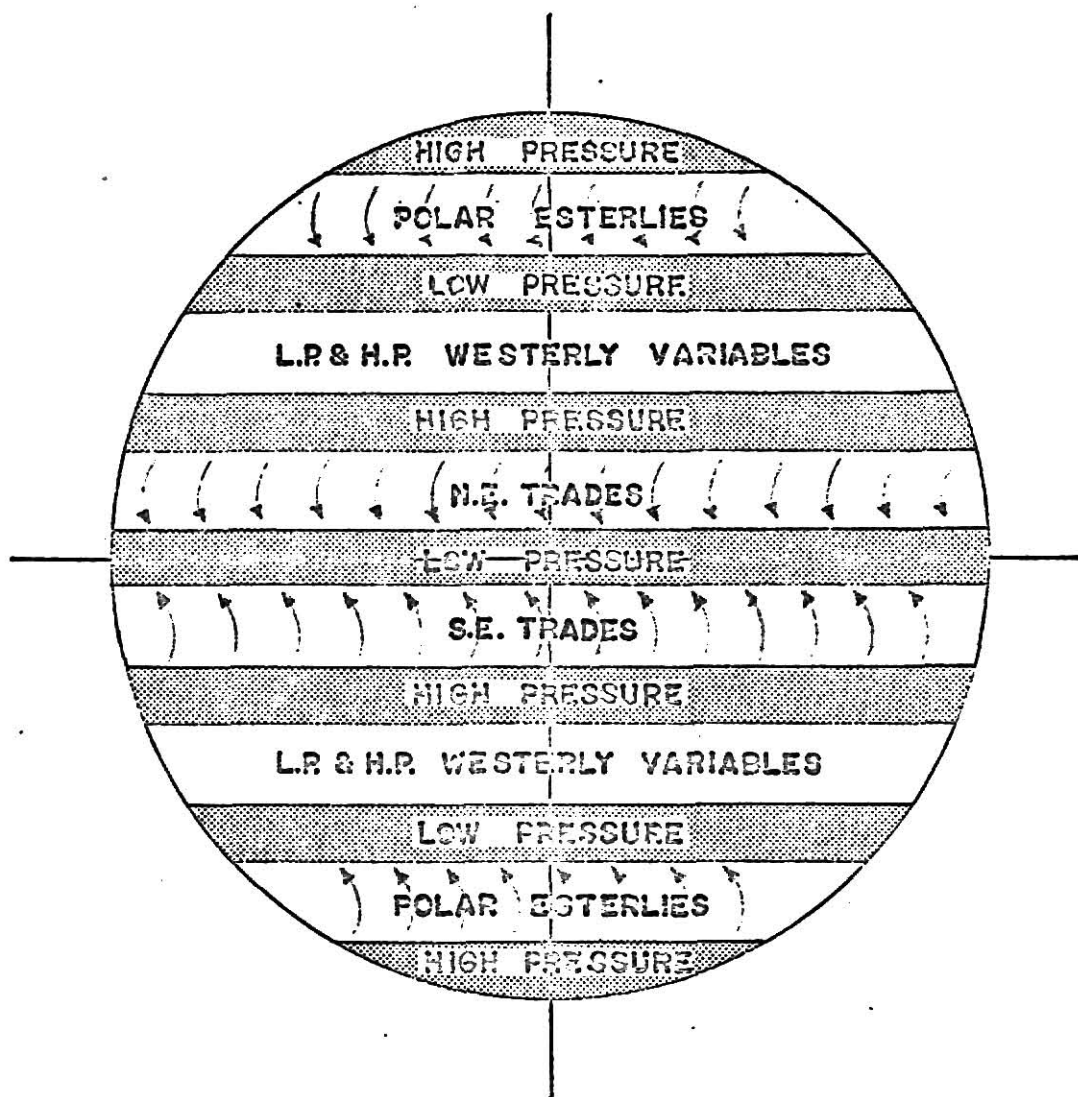


FIG. 10

PLANETARY CIRCULATION OF THE WIND

Cement Blocks

These are a mixture of cement and sand. They are widely used in construction. They are designed to stand pressure, but they are light in weight. They are easy to join together with cement mortar.

Aggregates

These inexpensive local materials are used for decorative walls and outdoor floors.

Asbestos cement sheet

This is produced by cement factories. It is fire proof and its accoustical absorbtion value is high.

Terra-cotta and glazed tiles

Terra-cotta tiles are popularly used to cover floors. They have many shapes and various colors. Glazed tiles have been used as a roofing material on residences and temples.

Roofing materials

New roofing materials have been introduced on the market to make more practical and economical roof constructions. They are made in 3 x 6 feet or 4 x 8 feet sizes. They have a design of small wave running through their length. They are about 1/8 inch in thickness. These new materials which are a mixture of cement and asbestos are lighter than the old fashioned glazed tiles.

Stones

These local materials are found in mountainous coastal areas. They are used in mixing concrete. Beautifully colored and fine textured stones are used for decorative walls and floors.

Imported Materials

Aluminum Products

These materials are imported mostly from Japan, U.S.A., and Taiwan. The aluminum door and window frames, sun louvers, and grills are actively in fashion in modern architecture.

Steel Rods

The construction in Thailand is aggressive in using reinforced concrete. New methods and techniques of using reinforced concrete are being developed. High tension steel rods and special quality steel rods are widely used in new construction. These steel rods are imported from Japan.

Hardware and sanitary equipment

These materials are imported from Belgium, England, U.S.A., and Japan.

Public Utilities

Electricity

Electricity is relayed from the sub-station at Lardkrabang, which is supplied by the Central Electricity Board, Electricity Organization of Thailand.

Water Supply

Water supply is operated by the Water Work Department, Municipality of Bangkok. It is supplied from the reservoir at Kardkrabang. Charges are based on bulk system.

Gas

Gas usually comes in tanks, but it will be supplied by mains in the near future.

Sewage Disposal

A public sewage system is lacking, and sewage is disposed off through septic tanks on each site in areas where the underground is not saturated with water.

Municipality of Bangkok Authorities and Building Regulations

The Municipal Architect: approves proposed building scheme

The Municipal Sewage Engineer: sewage system and engineering works

The Municipal Surveyor: site surveys, etc., issues certificate of fitness for occupancy.

Building By-Laws (Bangkok): Building regulations and requirements.

Building By-Laws

Public Building

"Public building" means a building used or constructed or adapted to be used as a school, college, hospital, hotel, theater, church...or used or constructed or adapted to be used for any other public purpose.

Open Area in Rear of

Public buildings, warehouses abutting a back lane shall have an open space inclusive of half of the back lane equal to 10% of the building on area and all such buildings shall be provided with quarters for a watchman and such quarters shall be provided with bathroom and latrine.

Cooridor Width

No cooridor shall be constructed less than one and one-half meters wide.

Corridor Lighting

All cooridors shall be efficiently lighted by openings to the external air.

Various Parts of the Building

1. Any bedroom or livingroom in a building shall not be less than 250 centimetres in width or length, and shall have a total floor space of not less than 9 square metres, and the total area of doors and windows not communicating with other rooms shall not be less than 1/10 of the floor space.
2. Any room that can be entered by a person, shall have enough ventilation openings even when all the doors are closed. The method of ventilation shall be in accordance with the design which is appropriate to the building.
3. A passage in a building shall have a width of not less than 100 centimetres, and there shall be no post obstructing any part of

the passage to a narrower width than that. In addition, provision shall be made for natural lighting so that the passage is clearly visible in daytime.

4. The top of any window or door of a bedroom or a livingroom shall be at least 200 centimetres above the floor, and such window or door shall be easily opened.

Sanitation

1. The building to be constructed shall have a convenient system of draining waste water from the building.
2. In laying the drain leading from the building to the public drain, there shall be a gradient of not less than 1 to 200. The drain shall be laid as straight as possible. If it is composed of round pipes, there shall be provided with inspection pits at distances of 30 metres and all the bends.
3. If no special public drain is provided for the drainage of soil water from the building, the Provincial Governor may withhold permission for the drainage system, until the owner of the building had made the soil water more suitable.
4. All buildings except for a residential building occupied by the owner shall be connected with the public water supply if there is a water main on the adjacent road.
5. In laying the drainage system and drain pipes, the water supply pipes, the draining pipes within the building and the different equipment needed for pipe connection and sanitation according to modern technics.

6. Any building liable to be occupied or used by persons shall be provided with a suitable number of toilets, and not fewer than the number stipulated below:
 - 6.1 A residential building shall have one toilet per building
 - 6.2 A row tenement or a row brick tenement shall have 2 toilets for every 5 units.
 - 6.3 A hotel shall have a toilet for every ten guests it can accommodate
 - 6.4 A school and workshop shall be provided with a toilet for every 100 persons who use the building.
 - 6.5 A meeting hall and theatre shall be provided with a toilet for every 300 persons who use the building.
 - 6.6 The toilet room shall have an area of not less than 1.50 square metre per toilet, be conveniently situated, regularly cleaned and provided with an impermeable floor and suitable ventilation.

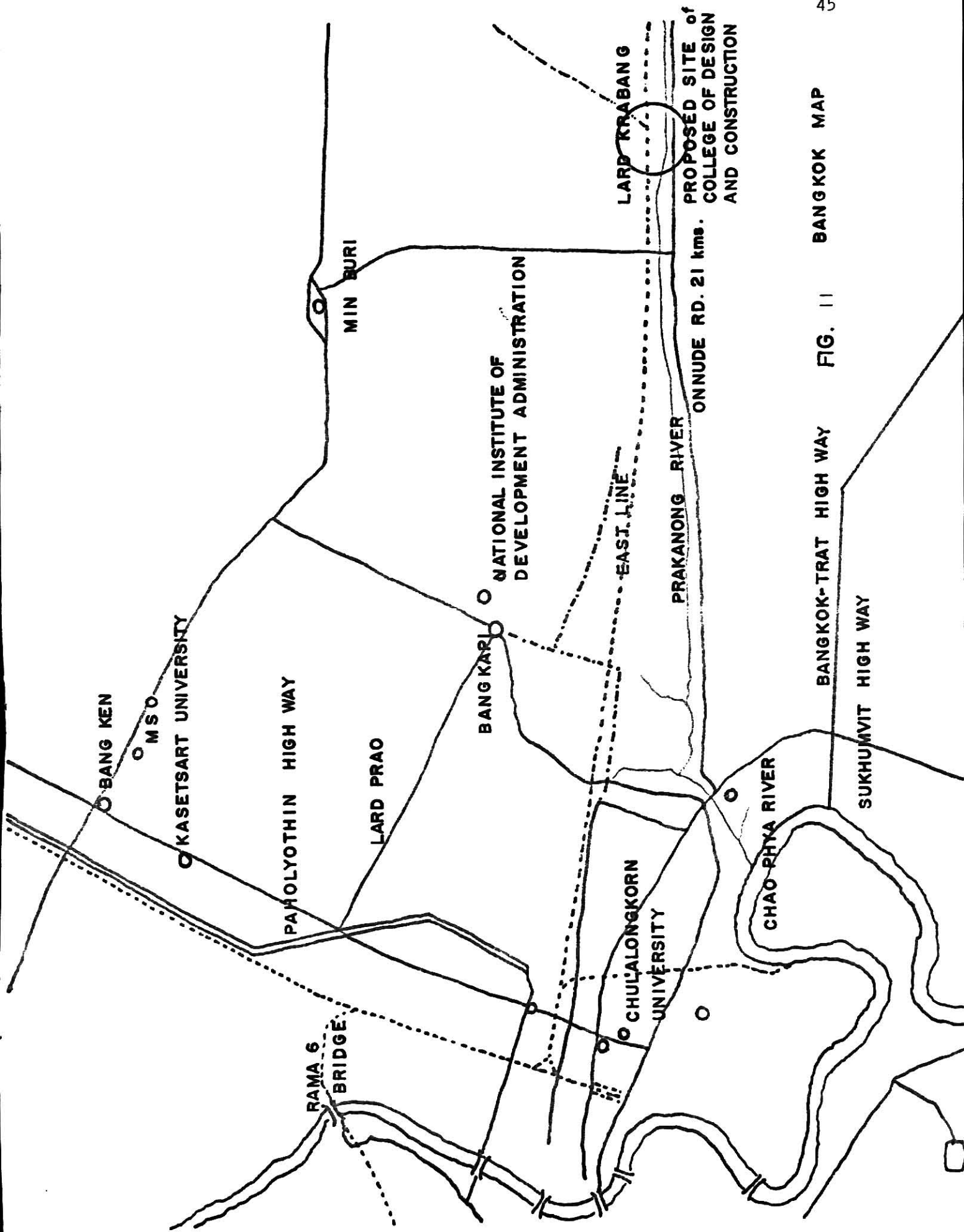


FIG. 11 BANGKOK MAP

COLLEGE OF DESIGN AND CONSTRUCTION

The College of Design and Construction was the first institute of higher technical training in special lines to be established by the Department of Vocational Education in Thailand. Originally it was a school for the advanced training of designers and builders, but in 1963 the status of the school was raised to the level of a technical institute, with appropriate improvements in curricula and extensions of programs. At present, the College offers instruction at a three-year Diploma level in the fields of Architecture, Architectural Engineering, Landscape Architecture, Interior Design, Industrial Design, Highway Engineering, Survey Engineering, Regional Planning, Urban Design, and Special Vocational Studies. The various programs are administered under the jurisdiction of seven separate departments.

The rapid growth of the College in recent years reflected the urgent needs for a greater rate of economic growth and development of the country. These needs have been well recognized by the Government, and the expansion of the College was initiated and carried out as an integral part of the National Education Development Plan.

Requirement for Admission

An applicant must be a high school graduate and a holder of the certificate of Education either in General Studies with a specialization in Science, or in Vocational Education.

In addition he must satisfy the requirements of the National Education Board. He must also show evidence that he has sufficient

financial support for the selected three-year study program at the college.

ARCHITECTURE DIVISION

Objectives:

To enable the students to earn experiences and clear concepts of architectural design, they must have good morale, taste, and culture. The responsibility on their duties to society must be put in their minds as well as consideration of good problem solving. Architecture appreciation is their ideal.

ARCHITECTURAL ENGINEERING DIVISION

Objectives:

To offer the students the high level engineering technology to create the contemporary architecture of which will be able to serve the society and to meet the economic situation. High rise structure and wide span structure should be stressed in their study. The students who want to take these subjects as the major courses should hold good cumulative records in mathematics and science. The graduates are able to assist architects and engineers through the architectural engineering projects.

HIGHWAY ENGINEERING DIVISION

Objectives:

Southeast Asian countries are developing. This part of the world is short of connecting roads to fertile lands. Highway construction is the urgent need in order to contribute facilities and to eliminate

time consuming in communications. The graduates, undoubtedly, will be able to cooperate with the highway engineers to fulfill this demand of our nation.

SURVEY ENGINEERING DIVISION

Objectives:

Transportation projects, urban renewal planning, land use program, irrigation for land development, and natural resource exploration including the land title deed for the whole country needs thousands of surveyors a year. Many institutions have launched surveyors only numbering one hundred annually. Our well trained students holding a high level of technology are able to help our country a great deal.

INTERIOR DESIGN DIVISION

Objectives:

As usual, interior decoration costs more than the building itself. Good architects for exterior design can be found very easily but good interior designers are very rare. The graduates will raise the standard of the interior decoration with their high ideal of considerable economy and moderate expressions, thus showing how well they as the designer can fit the job.

INDUSTRIAL DESIGN DIVISION

Objectives:

To prepare students readily for their profession in industrial design, initiation and appreciation of the progressive created thoughts

will be their ideal. They will have experience and knowledge to strengthen their work for more efficiency.

Subjects	Semester 1		Semester 2		Semester 3		Semester 4		Semester 5		Semester 6	
	lt.	st.	cr.	lt.	st.	cr.	lt.	st.	cr.	lt.	st.	cr.
G. 01 Language	3	-	3	-	3	-	3	-	3	-	-	3
G. 02 Physics	3	-	3	-	-	-	-	-	-	-	-	-
G. 03 Hygiene	1	-	1	-	-	-	-	-	-	-	-	-
G. 04 Mathematics	3	-	3	-	3	1	-	-	-	-	-	-
G. 05 Statistics	-	-	-	-	-	-	-	-	-	-	-	-
E. 01 Engineering Drawing	-	6	2	-	6	-	-	-	-	-	-	-
E. 02 Highway Engineering	2	3	3	-	3	-	-	-	-	-	-	-
E. 05 Descriptive Geometry	-	-	-	-	-	-	-	-	-	-	-	-
E. 06 Hydrology	-	-	-	-	-	-	-	-	-	-	-	-
E. 08 Survey	2	3	3	-	3	2	2	3	3	-	-	-
E. 09 Route Survey	-	-	-	-	-	-	-	2	2	-	-	-
E. 10 Survey Computation	-	-	-	-	-	-	-	3	3	2	-	-
E. 11 Electronic Survey	-	-	-	-	-	-	-	1	-	3	-	-
E. 12 Astronomy	-	-	-	-	3	2	-	-	-	-	-	2
E. 13 Mine Survey	-	-	-	-	-	2	2	-	-	-	-	-
E. 14 Geology	-	-	-	-	-	1	1	-	-	-	-	-
E. 15 Land Survey	-	-	-	-	-	-	3	1	3	3	-	-
E. 16 Technical Instruments	-	-	-	-	-	-	-	3	3	4	-	-
E. 17 Photogrammetry	-	-	-	-	-	-	-	3	3	3	3	4
E. 18 Cartography	-	-	-	-	-	-	-	-	-	-	3	3
E. 19 Map Projection	-	-	-	-	-	-	-	-	-	-	3	3
E. 20 Geodesy	-	-	-	-	-	-	-	-	-	3	3	3
R. 01 Organization and Management	-	-	-	-	-	-	-	-	1	1	-	-
R. 04 Law and Land Registration	-	-	-	-	-	-	-	2	2	1	2	-
R. 05 Humanity	-	6	2	-	3	1	1	-	1	1	1	1
R. 07 Landscape Architecture	-	-	2	-	-	-	-	-	-	1	1	2
R. 08 Applied Mechanics	2	-	2	-	-	-	-	-	-	-	-	-
R. 10 Soil Mechanics	-	-	-	-	-	-	-	-	-	-	-	-
R. 13 Traffic Engineer and City Planning	-	-	-	-	-	-	-	-	-	2	3	2

Subjects	Semester 1		Semester 2		Semester 3		Semester 4		Semester 5		Semester 6	
	Lt.	st. cr.	Lt.	st. cr.	Lt.	st. cr.	Lt.	st. cr.	Lt.	st. cr.	Lt.	st. cr.
G. 01 Language	3	-	3	-	3	-	3	-	3	-	3	-
D. 01 Anatomy	1	3	1	3	-	12	-	12	-	8	-	8
D. 02 Theory of Interior Design	3	6	3	6	7	1	7	1	12	-	2	12
D. 03 Materials and Process	-	-	1	-	1	-	1	-	-	-	-	-
D. 04 History of Furnitures	-	-	-	-	1	1	1	1	-	-	-	-
D. 05 Exhibition	-	-	-	-	2	2	2	2	3	3	3	3
D. 11 Painting	-	3	3	2	2	2	-	3	3	2	1	3
D. 12 Sculpture	-	3	-	3	2	3	-	3	3	2	-	3
D. 14 Estimates	-	-	-	-	-	-	-	-	-	-	2	2
A. 01 Graphics	-	6	-	6	-	-	-	-	-	-	-	-
A. 06 Services and Equipments	-	-	-	-	2	-	2	-	-	-	-	-
R. 01 Organization and Management	-	-	-	-	-	-	-	-	1	1	-	-
R. 05 Humanity	-	6	-	6	3	3	1	1	-	-	1	1
R. 12 Landscape Gardening	-	-	-	-	2	2	2	2	3	2	3	2
	7	27	22	8	27	23	11	24	23	11	24	23

PROJECT REQUIREMENTS

Academic core

Administration Office

Library

Lecture Rooms

Studios

Lounge

Faculty Staff Rooms

Public Toilets

Lobby

Workshops

Health Center

Food Center

Dormitory

Faculty Housing

Recreation Areas:

Gymnasium

Track and field

Parking Space

Auditorium

Student Union

COLLEGE OF DESIGN AND CONSTRUCTION

Space Requirements

	Area/sq.m.	No. of rooms	Unit sq. mi.
Administrative area:	2500		
Lobby			
Director			
Deputy Director			
Academic Affair			
Reception--Record of Students			
Conference			
Library and Audio Visual	2500		
Drafting Studios	2500		
Lecture Rooms	1500		
Soil Lab.	400	1	400
Hydro. Lab.	400	1	400
Concrete Testing	400	1	400
Strength of mat.	400	1	400
Weaving	400	1	400
Ceramic	400	1	400
Metal	400	1	400
Wood Work	400	1	400
Student Activities Spaces	800		
Recreation Area	8000		
Food Center	1500		

A DESIGN FOR COLLEGE OF DESIGN & CONSTRUCTION
LARDKRABANG DISTRICT
BANGKOK, THAILAND

Site Study

The site of about 85 acres is to be allocated on the north side of the Phra Kanong River. The Lardkrabang Railway Station is located on the north by a distance of 150 meters. To the West, the land, which is covered with the coconut trees, gently slopes toward the church. A proposed site of the Agriculture College is on the east. The existing road from Sukhumvit Highway to Lardkrabang district feeds the new site on the south by a distance of 21 kilometers. The area seems to be ideal for future expansion of vocational education.

Since the site is facing south, the wind, during the hot day, is from north and northeast, and during the night, is from the south and southwest. Air-conditioning will be used in some parts of the design for convenience, but cross ventilation shall basically govern the design since, to begin with, the college needs to relate itself with the nature. The length of the building will be perpendicular to the direction of the winds.

It is decided that the design should take full advantage of the natural setting. A design with changing levels is considered in order to create aesthetical values by level variation and to avoid horizontal conflict to split scenic views at various levels and to give privacy.

The location of the buildings should allow for these physical and visual functions.

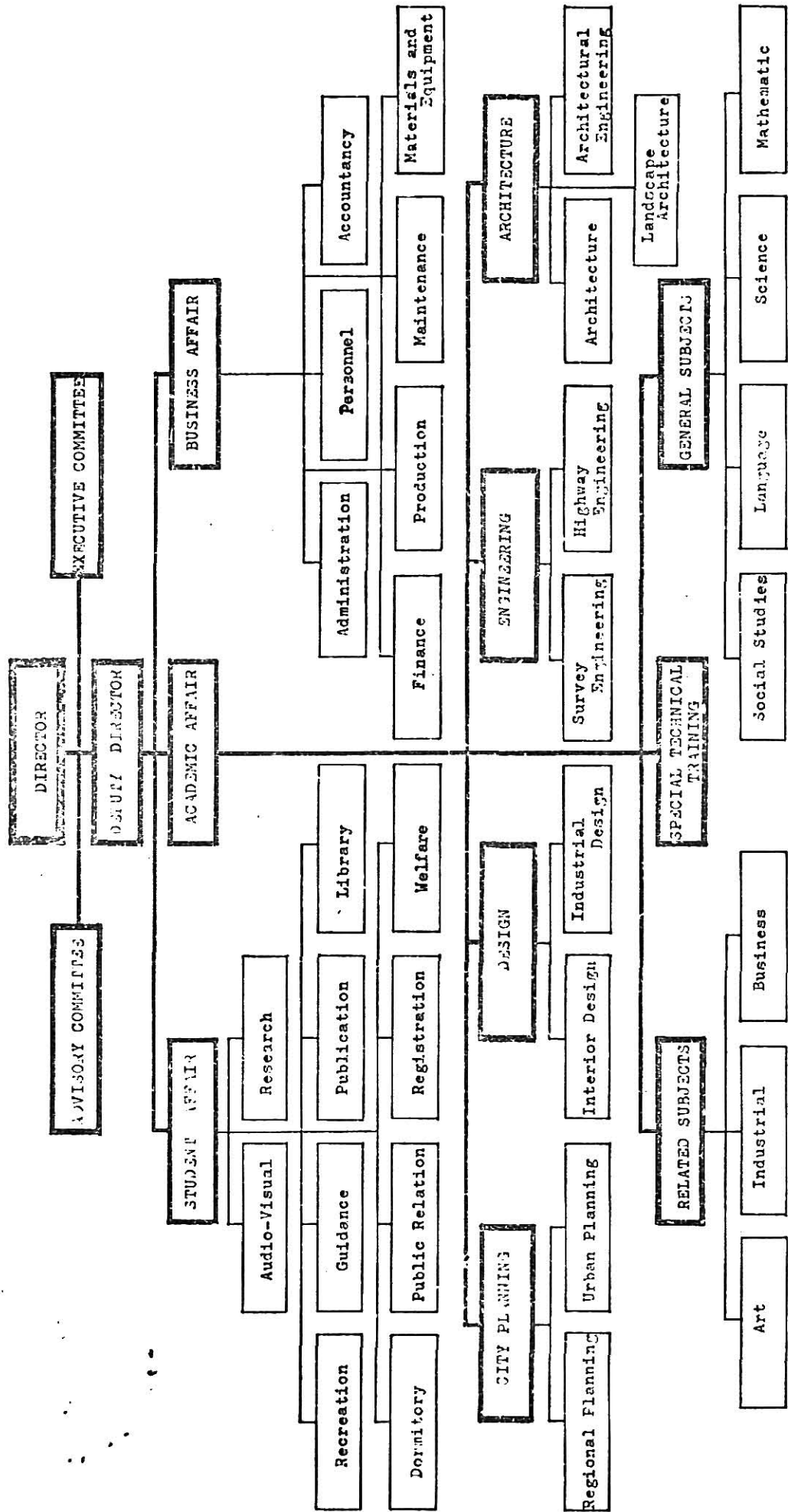
To synchronize with the needs of views from many windows and cross ventilation, it is logical to orient the buildings to face south or southwest. Sun control is a major problem, especially during the harsh afternoon hours. Long cantilevers will be used in the design to create shadows and to obstruct the monsoon rains. Cantilevers do not obstruct pleasant views or the winds. Screen-, louvers, and fins will be used supplementarily in some parts to obstruct the sun and the rains. The surrounding trees also help obstruct the sun, reduce the heat, and increase the wind velocity while the nearby landscape is enhanced:

Landscape

Landscape plays an important part in the design of a college. For the simple reason, the buildings should enjoy the view of the river. To assure this, low-rise buildings should not be located at the back of taller buildings. In planning the site, the existing coconut trees should be kept intact in the site as much as possible since they are beautifully pleasant in a riverside and their slimness does not obstruct the view.

The surface water from rain will drain into the river and be partially absorbed by the ground. The problem of surface drainage will be solved by grading and the provision of drainage gutters along the site.

ORGANIZATION CHART COLLEGE OF DESIGN AND CONSTRUCTION



Besides establishing a pleasant environment, plants, especially trees, should be instrumental in dealing with solar heat and glare as well as creating shades and perhaps coziness in outdoor space.

Materials

The considerations in selecting materials used in the design of this college will be based on availability, durability, structural compatibility, and ease of maintenance. Concrete will be used in this design because of its durability and structural types used. It is considered economical to use local materials in the design. These include stones, rocks, and woods besides reinforced concrete in this case. The contrast of materials by their colors and textures creates attractiveness and local character. High quality woods will be used for decorative works and furniture.

Some of the imported materials such as hardwares and sanitary equipment will be used to ensure the quality standard at international levels.

Structure Compatibility

Concrete will be used the most in the structure of this college since it is the most enduring for the tropical climate and concrete is highly resistant to fire. Post and lintel concrete construction will be used in most of the design. Long cantilivers will be aptly adopted to provide protection from the rain and the hot sunlight and to reduce the

bending moment of the interior beams, while the technique of prestressing concrete will be utilized to further the reduction in size of the structure members. It is hoped that the beautiful structure of long cantilever shall be an element of excitement in this environment.

Wooden frames will be used in small members only since they are least durable due to the severe stress of heat and dryness.

ENVIRONMENTAL TECHNOLOGY: CONSIDERATION FOR TROPICAL ENVIRONMENT

Acoustics

Auditorium, work shops, lecture rooms, and studios require acoustical designing. The major acoustical problems are to exclude the outside noise and suppress the noise generated inside. The arrangement of rooms, isolation, and insulation are methods to exclude the penetration of sound from outside. Construction and the application of sound-absorptive materials and sound reflective materials will provide the optimum conditions for sound within the rooms.

The auditorium is designed to be used for multi-purposes of: lecture rooms, drama house, and movie theatre. Seating area is on the sloped floor, which is elevated for the purposes of good sight and sound wave reception. The side walls are broken into sections to create the best sound reflection.

The foremost considerations to be concerned with the problems of acoustical design of auditoriums are:

- to eliminate the unwanted sound
- to eliminate the echo sound
- to gain the optimum of reverberation time
- to gain the best audibility of all performance

Workshops, lecture rooms, and studios are designed in a manner that will provide a sound level conducive to optimum learning. The floors of all corridors should be concrete slab and covered with sound absorptive

materials. All pipes and ducts should be isolated from walls and solid structure by acoustical blankets.

Types of acoustical materials available

Acoustical materials used include:

Acoustical plaster and sprayed-on materials. These materials comprised of binder agents and plastic and porous materials applied with a towel.

Prefabricated units. These contain acoustical tiles, tile boards absorbent sheets, and mechanically perforated units backed with absorbent materials.

Acoustical blankets. These materials are made of mineral, wood wool, glass fibers, kapok batts, and hairfelt.

Air Conditioning

In this tropical area, heating is not needed, but air conditioning is considered a necessity for comfort and health of the students. Besides cooling the rooms, air conditioning controls the gentle movement of the air and eliminates smoke, bacteria, fumes, odors and excessive moisture.

Two basic area in the buildings to be considered in the design of air conditioning are: the studios on the fourth floor, the library in the basement, and the first floor of the academic core, and the auditorium.

Two types of air-conditioning systems will be used in this college: the central air-conditioning system in the academic core and the auditorium, and the window units system in the faculty housing units.

The total refrigeration load should be calculated on the basis of maximum occupancy and critical exposure. It is essential to assume that air-conditioning will operate almost 20 hours a day during the summer-time.

Lighting

Proper design of lighting will establish comfort and expose the aesthetical quality of an environment. In the interest of aesthetics, lighting should be designed to harmonize with architecture and to define function in a revealing manner.

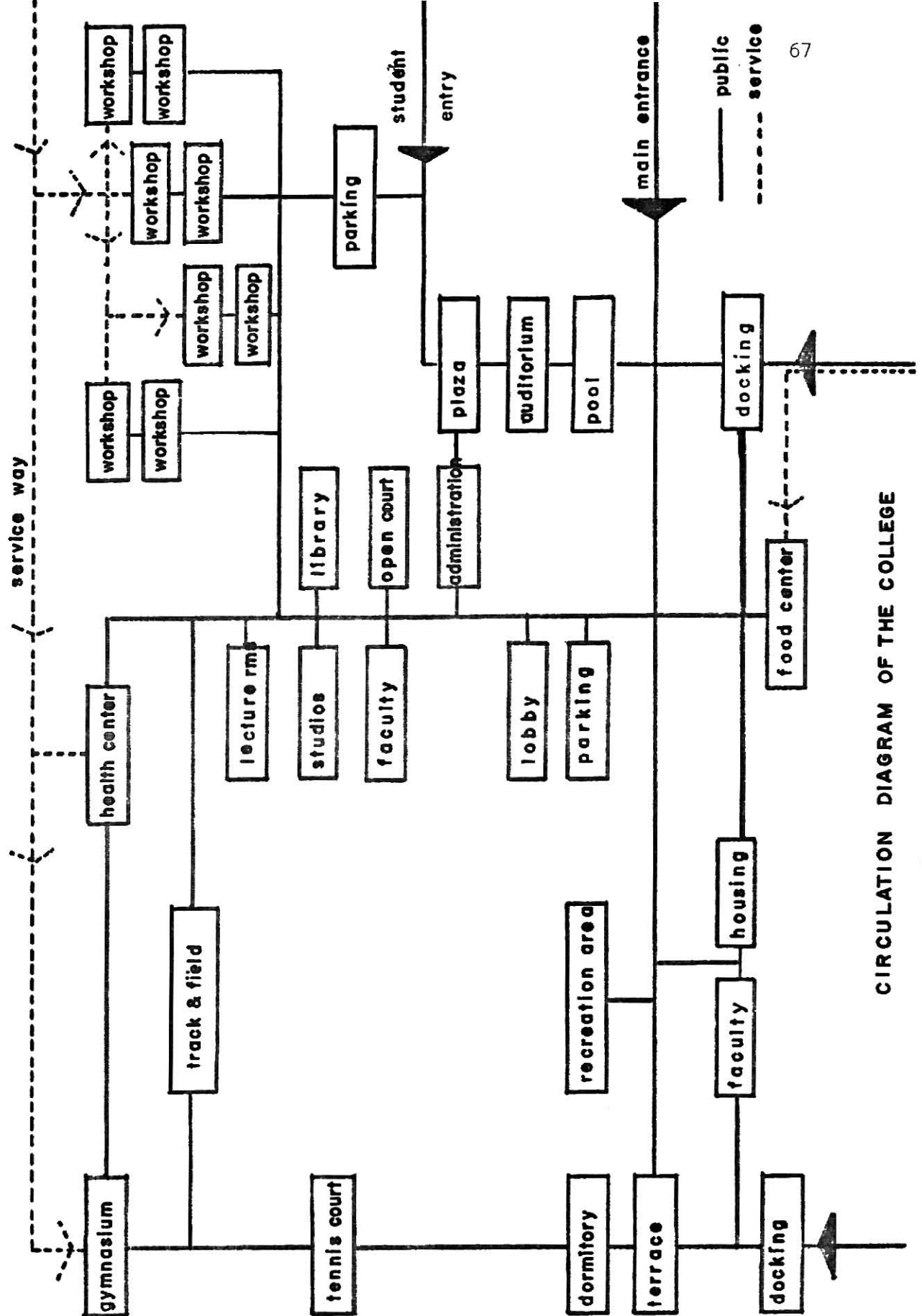
Both natural light and artificial light will be used together in this design. Because of psychological and economical reasons, natural light will be predominantly used in the design. Windows, skylights, and clear-storeys will be designed to invite natural light to come in. The problem of glare from natural light can be solved by using screens and overhangs. Trees and shrubs may help, also.

Natural light will be used in spaces such as open court, studios food center, and family units.

A 24 hour artificial light source will be used to secure lighting condition because weather variations call for such a provision. Artificial light is preferred in lecture rooms, shops, studios, and the student union.

The lighting of any interior space can be evaluated functionally and aesthetically; in planning, these two aspects should be considered separately. The functional planning should be completed before any consideration is given to aesthetics.

Illumination levels for various tasks are recommended in accordance with the nature of the task, such as 30 foot-candles for typical lecture rooms, offices, study halls, shops, and libraries; 50 foot-candles for drafting rooms, studios; 20 foot-candles for gymnasium and reception rooms. In case where the visual tasks are more difficult, such as machine work in a shop or the use of dark materials in working, it is advisable to provide 100 to 200 foot candles of illumination.



CIRCULATION DIAGRAM OF THE COLLEGE

DESIGN CONCEPT AND CONTENT

Academic Core

The academic core will consist of administration offices, lobby, lounge, restrooms, library, lecture rooms, and studios. The library will be located at the basement and the first floor on the northeast of the academic core. The administration office will be located on the second floor. The lecture rooms, studios, and the faculty lounge will be located on the third and fourth floor.

The high-rise academic core make it possible to take full advantage of the river view and the surrounding landscape.

This massive building must be centrally located. It should be designed to invite and to impress students.

Auditorium

The auditorium will be located near the public entrance and the river. The auditorium will consist of student union, theatre, and the coffee shop. The reflecting pool and a plaza will create the pleasant atmosphere.

Food center

The food center will be located by the river side near the auditorium and the living quarters. Out door dining on the terrace will be provided. This should create an interesting atmosphere even when it is operated on an overflow capacity basis.

Health Center

The health center will be located near the workshops, the academic core, and the recreation area. It is easily accessible from the living quarters and the service way.

Workshops

A group of workshops will be located on the northeast of the site. It is easily accessible from the serviceway, the academic core, and the library.

Living Quarters

Dormitory

The high-rise dormitory makes it possible to take full advantage of the river view and surrounding landscape. It will provide 50 units for 300 students. The length of this building will be perpendicular to the direction of the winds. This building is located on the southwest Next to the faculty housing units.

Faculty Housing Units

This three story building is located near the food center and the river side. It will provide 36 units for the teaching staff.

Gymnasium and Recreation Area

Gymnasium

The Gymnasium is located on the northwest of the site next to the track and soccer field. It will provide a basket ball court, locker rooms, and 400 seats for students.

Recreation Area

The fantastic tropical nature of the Lard Krabang District makes this area a beautiful riverside recreation area. The existing coconut trees will create shades and coziness in outdoor space.

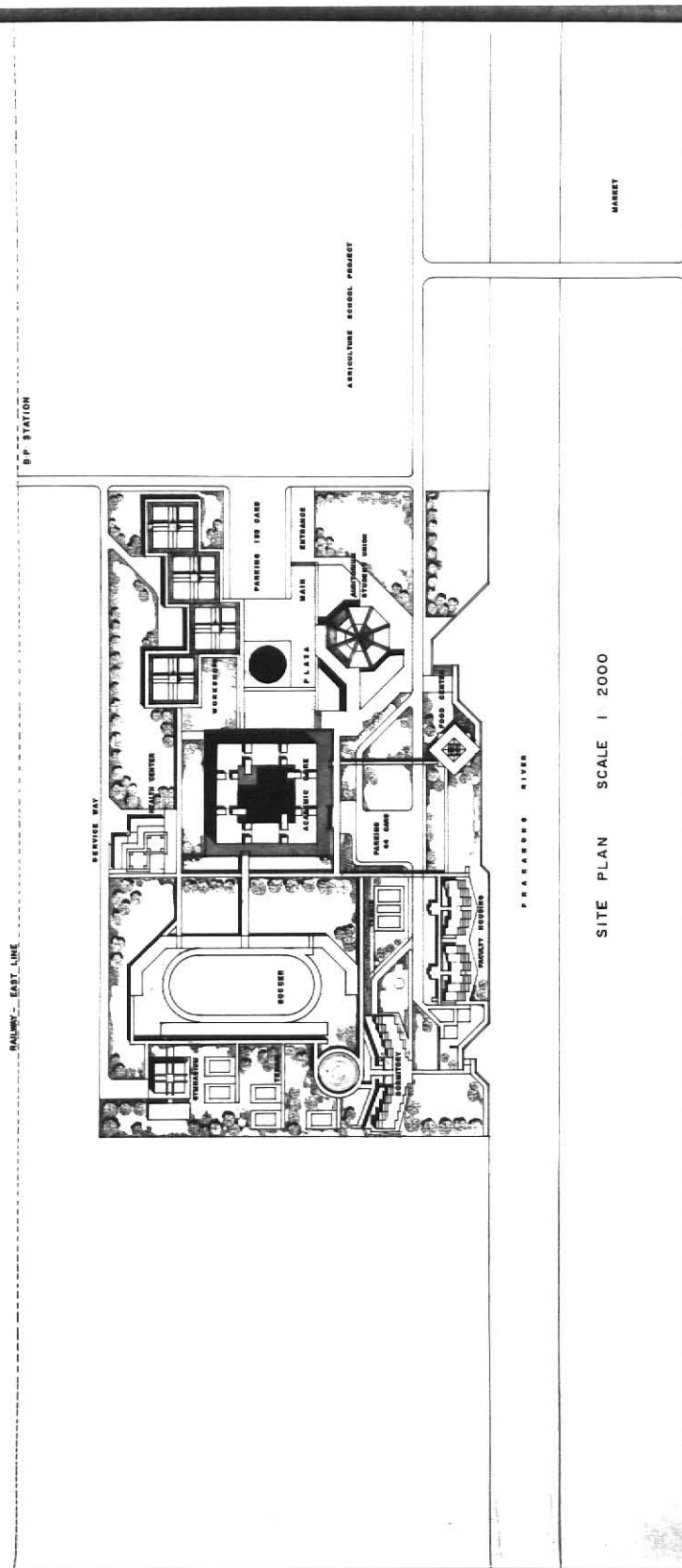
CONCLUSION

By the pressing and massive need for the expansion and improvement of vocational training, more and higher quality vocational schools are needed to meet the demand of a rapidly growing population and economy of Thailand.

This project is the design of the College of Design and Construction, the first institute of higher technical training in specialized field to be established by the Department of Vocational Education in Thailand.

The design of this college must start with an encompassing philosophy derived through a whole system of research, analysis, decision, and design that proceeds to the construction procedure for the completion of the project.

PRESENTATION



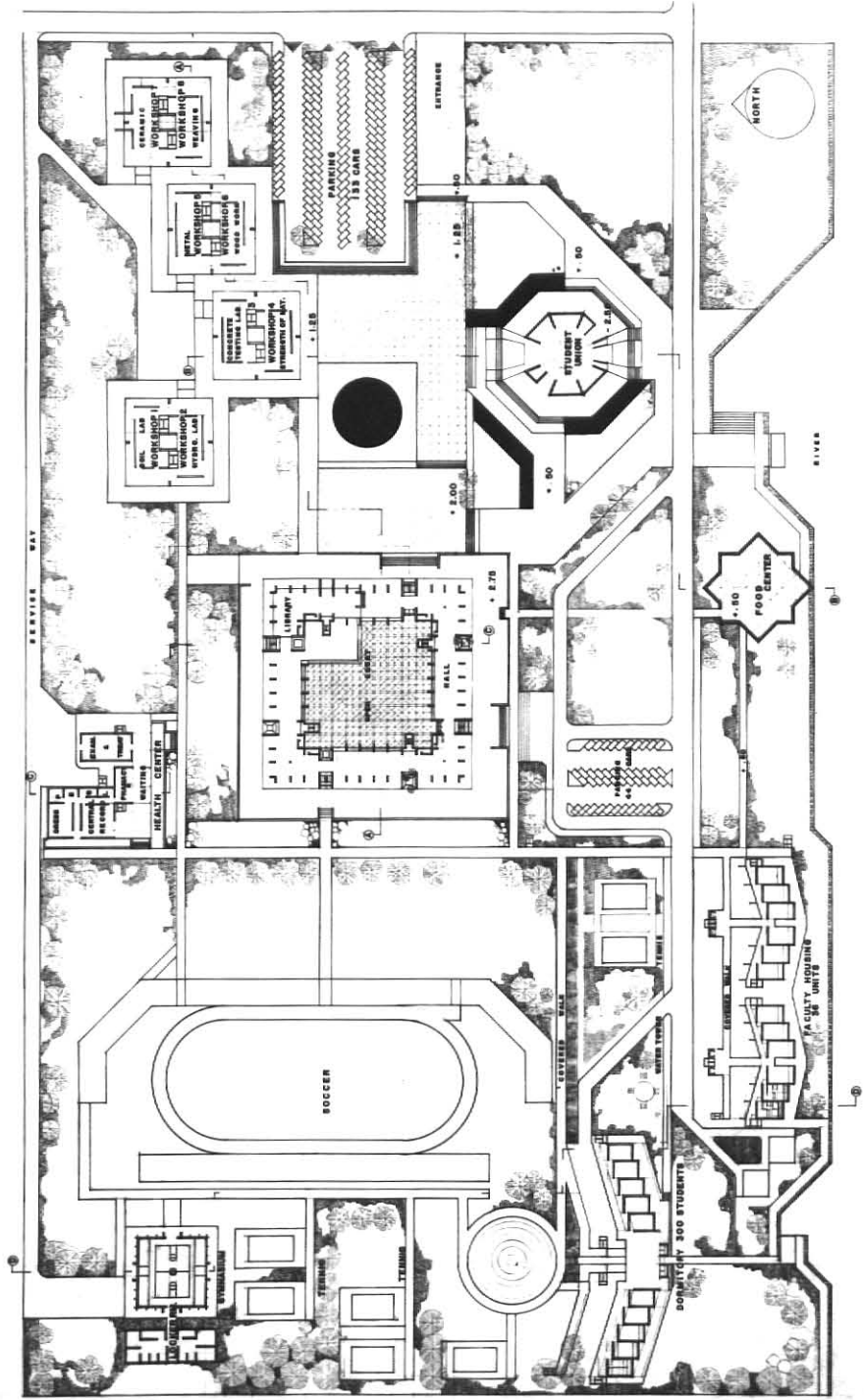
COLLEGE OF ARCHITECTURE AND DESIGN

KANSAS STATE UNIVERSITY

A MASTER'S THESIS
M.A. 1929; PROF. FREDERICK D. MILES
BY: PRACHYA CHAKRABORTY

BANGKOK
THAILAND

COLLEGE OF DESIGN & CONSTRUCTION

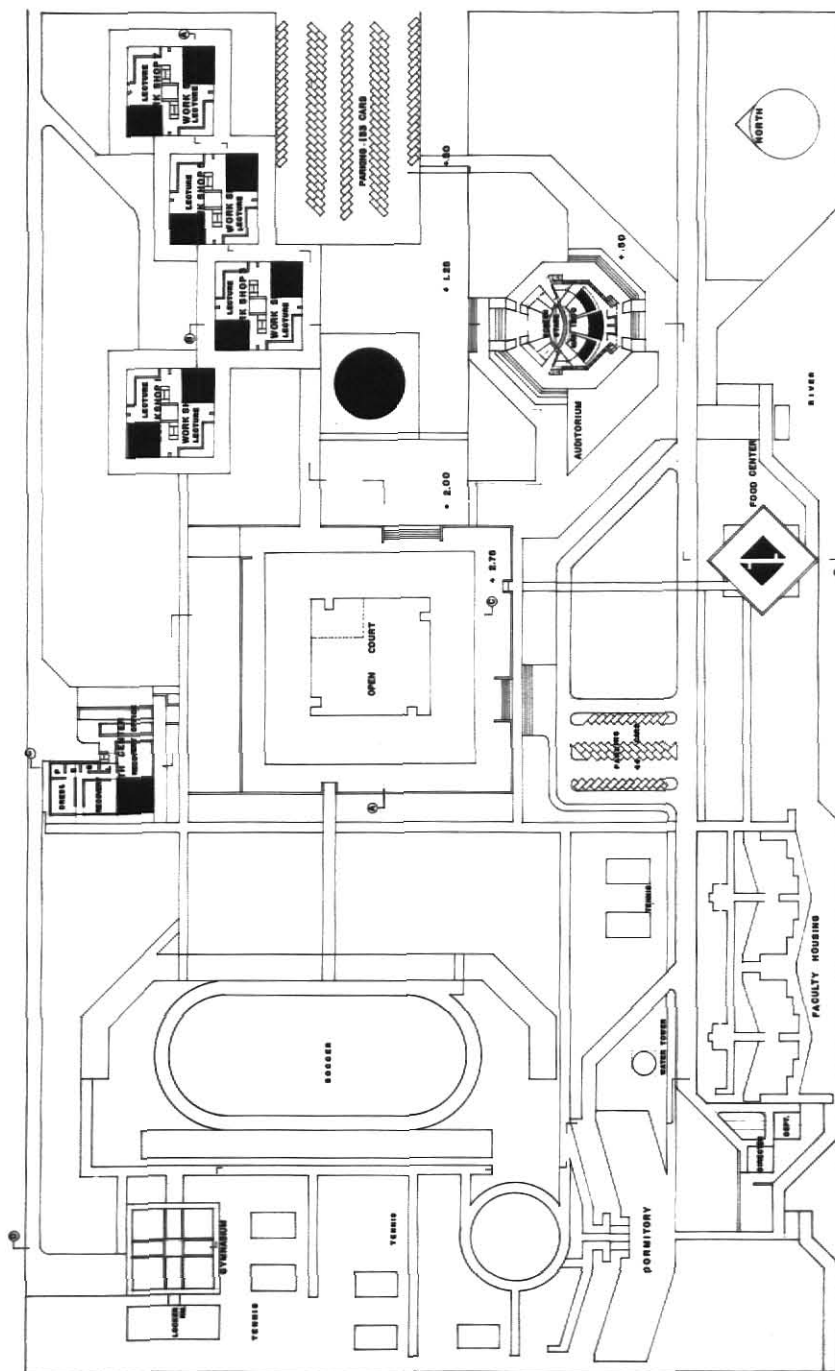


PLAN I SCALE 1:1000

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 BY: PRACHYA CHAKA-EDISSAK

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PLAN 2 SCALE 1:1000

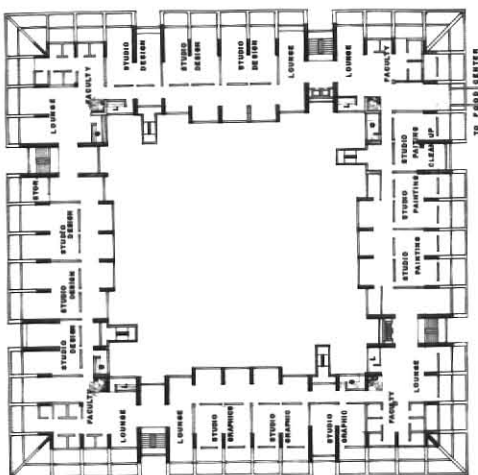
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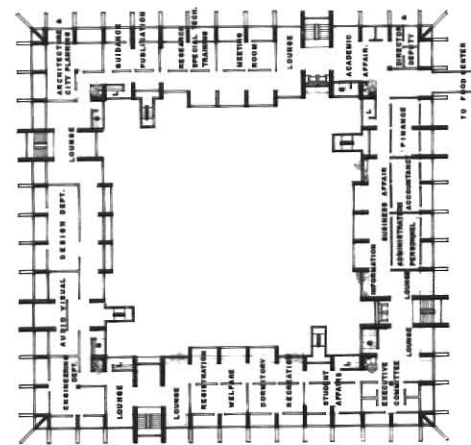
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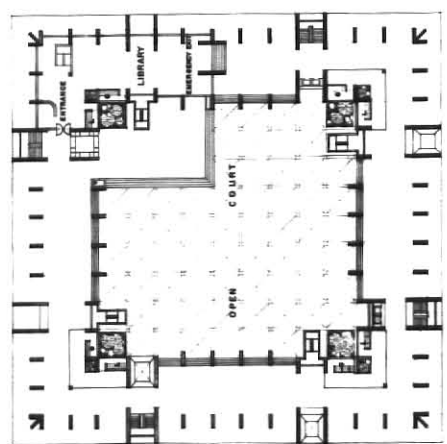
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BY: PRACHIYA SHARAFABENSAK



THIRD FLOOR PLAN SCALE 1:500



SECOND FLOOR PLAN SCALE 1:500



FIRST FLOOR PLAN SCALE 1:500

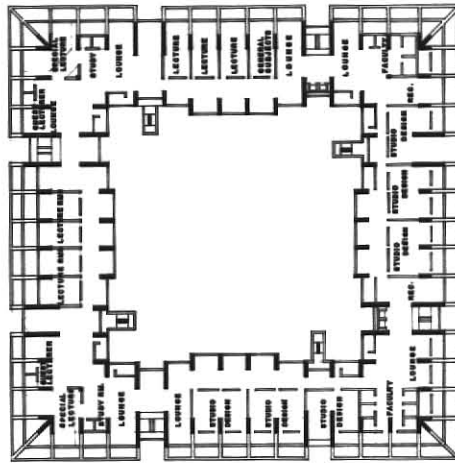
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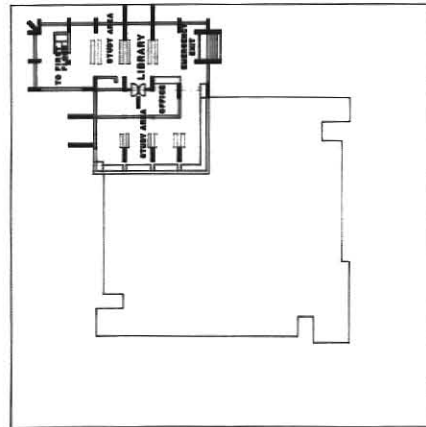
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MAJ. PROF. PROP. FREDERICK D. MILES
BY: PRAGHYA CHAKRABORTY

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FOURTH FLOOR PLAN SCALE 1:500



BASEMENT PLAN SCALE 1:500



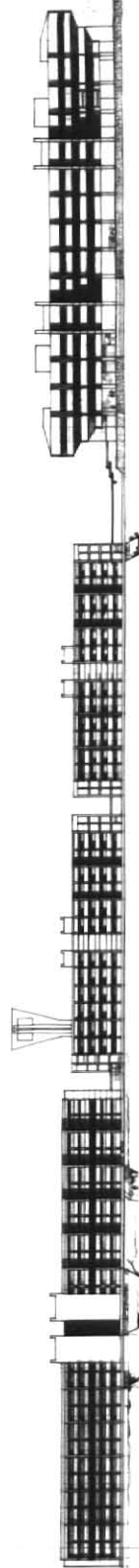
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BY: MACHAYA CHAKRABORTY

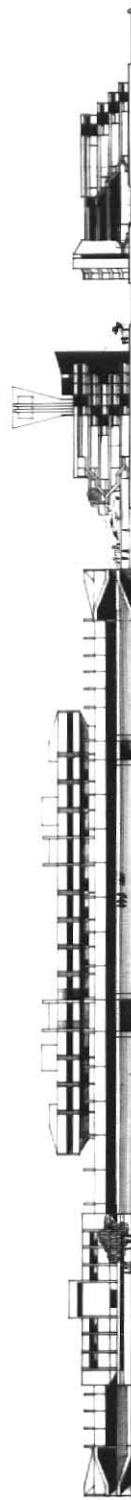
BANGKOK 5
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SOUTH ELEVATION

SCALE 1:500



WEST ELEVATION

SCALE 1:500

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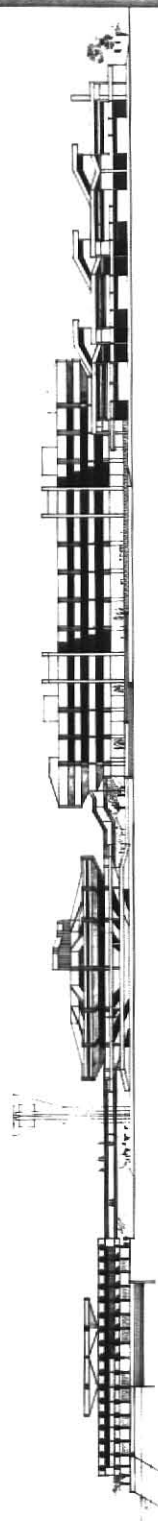
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BY: MR. J. PROF. FREDERICK D. MILES
BY: MR. ACHYA CHAKRABORTYBANGKOK 6
THAILAND 10

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SCALE 1:500

SOUTH ELEVATION



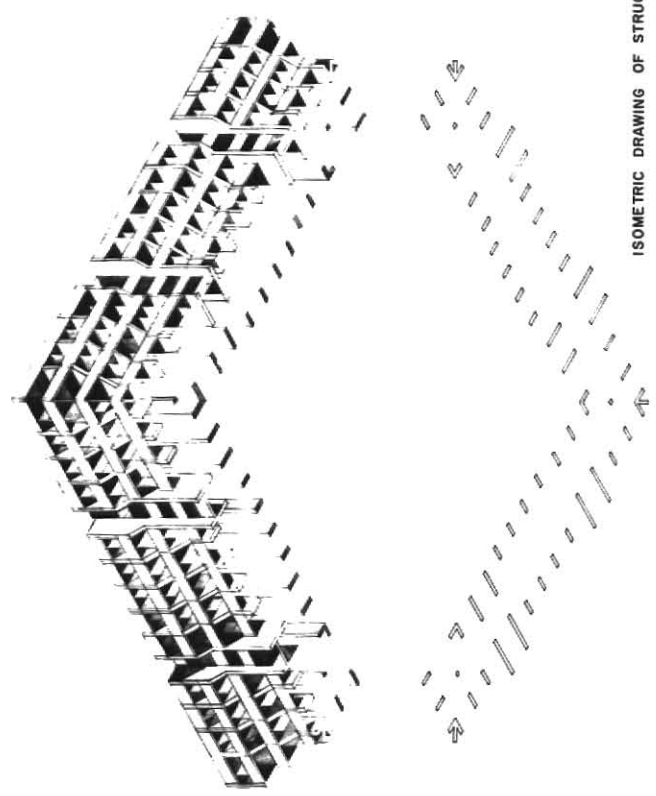
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EAST ELEVATION

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ISOMETRIC DRAWING OF STRUCTURE

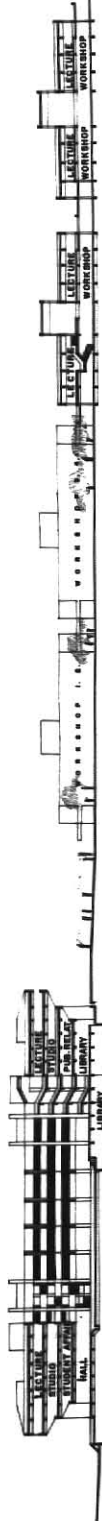
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SECTION THROUGH A A
SCALE 1:500



SECTION THROUGH B B
SCALE 1:500

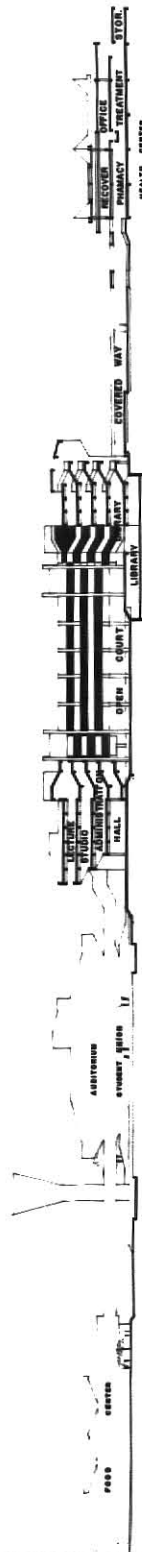
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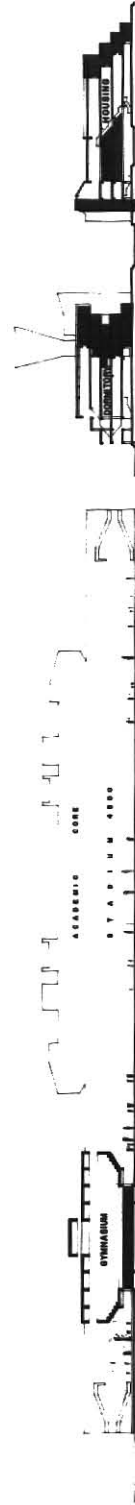
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THAILAND
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SECTION THROUGH C-C SCALE 1/8" = 1'-0"



SECTION THROUGH D-D SCALE 1/8" = 1'-0"

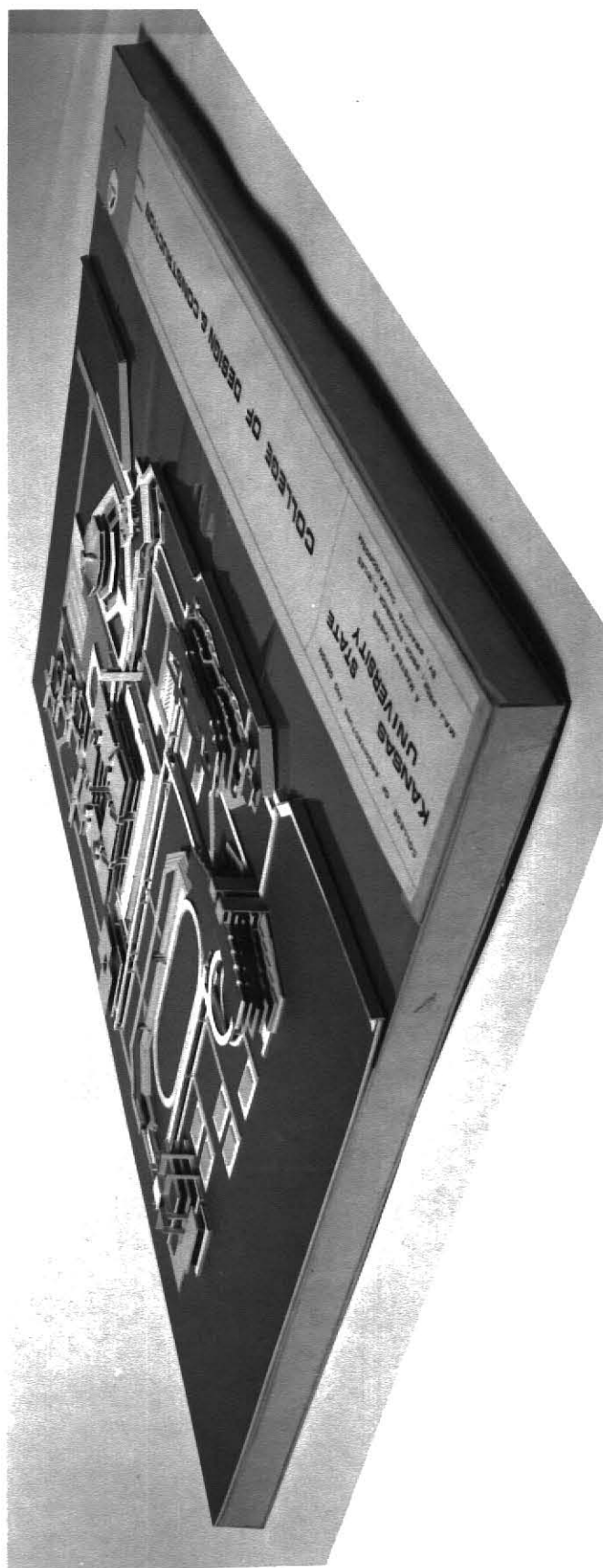
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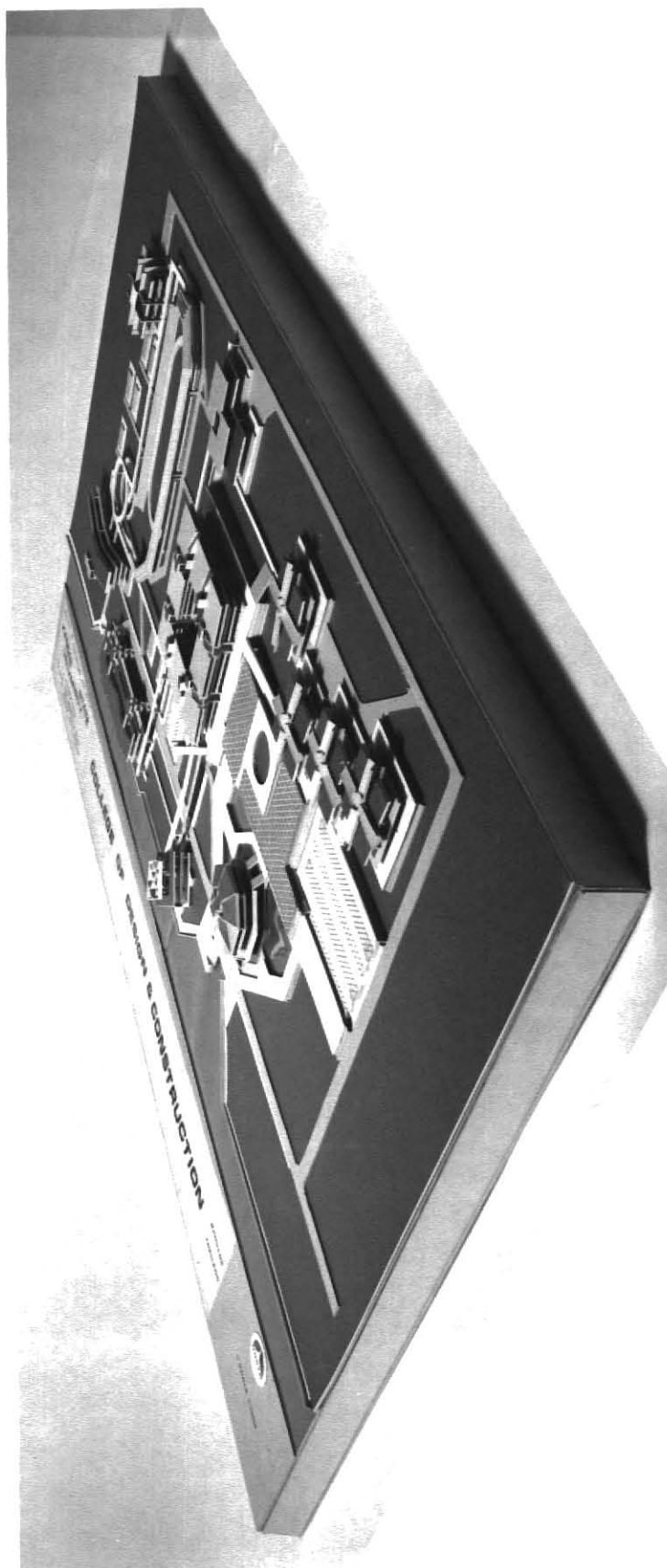
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A MASTER'S THESIS
BY: MR. FREDERICK D. WILES
BY: MR. CHAKA JONGKARN

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BANGKOK 10
THAILAND 10





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COLLEGE OF DESIGN AND CONSTRUCTION
Bangkok, Thailand

by

PRACHYA CHAKAJ SONGSAK

B. Arch., Chulalongkorn University
Bangkok, Thailand, 1965

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the
requirements for the degree

MASTER OF ARCHITECTURE

College of Architecture and Design

Kansas State University
Manhattan, Kansas
1972

Thailand, one of the Southeast Asian countries, is situated in the Indochinese Peninsula. Agriculture is the backbone of the national economy and agricultural products are the main exports of Thailand. However, since the Second World War, the world has been in the throes of great upheavals marked by economic chaos and world strife. Therefore the Thai Government has found it necessary to take an increasingly active role in the economic development of the country. Thai economy was no longer a monoculture economy based mainly on agriculture. The growth of national economy has also been accompanied by significant structural changes as a result of the increasing share of the gross domestic product originating from non-agriculture sectors, namely, manufacturing, construction, power, trade, and services.

The Industrial Promotion Act and the Promotion Industrial Investment Act have been introduced to serve this policy of the Government.

All these combined create the task for the Department of Vocational Education to prepare the trained manpower particularly in the fields of agriculture, construction, and industries.

By this pressing and massive need for the expansion and the improvement of vocational training, more and higher quality vocational schools are needed to meet the demand of a rapidly growing population and economy.

Vocational education now operates under the National Plan for Education. The bulk of the nation's vocational education activities is being rapidly formed into programs on five levels:

- a. three-year programs of vocational education at lower secondary schools;

- b. three-year programs of vocational education at upper secondary schools;
- c. two-year programs of education at technical institutes;
- d. short-course programs; and
- e. programs for vocational teacher education at degree level.

This project is the design of the College of Design and Construction. It was the first institute of higher technical training in a specialized field to be established by The Department of Vocational Education in Thailand. Originally it was a school for the advanced training of designers and builders. In 1963, the status of the school was raised to the level of a technical institute, with appropriate improvements in curricula and extensions of programs. At present, the College offers instruction at a three-year Diploma level in the fields of Architecture, Architectural Engineering, Landscape Architecture, Interior Design, Industrial Design, Highway Engineering, Survey Engineering, and special vocational studies. The various programs are administered under the jurisdiction of seven separate departments.

The rapid growth of the College in recent years reflected the urgent needs for technically trained personnel in the drive for a greater rate of economic growth and development of the country. These needs have been well recognized by the Government, and the expansion of the College was initiated and carried out as an integral part of the National Education Development Plan.

The substance of the project starts with three chapters introducing Thai history, Geographical and Physical Background, and the National Economy.

A discussion on the development of vocational education plus its significance and effects on the curricula will follow in chapters.

The contents in the last two chapters will include the architect's concept on site planning and environmental technology as guidelines for this eventual design.

The design is also based principally on the understanding of the natural and social environments, as well as the school system.

The architect's conceptual expression will be presented through architectural drawings and a scale model.