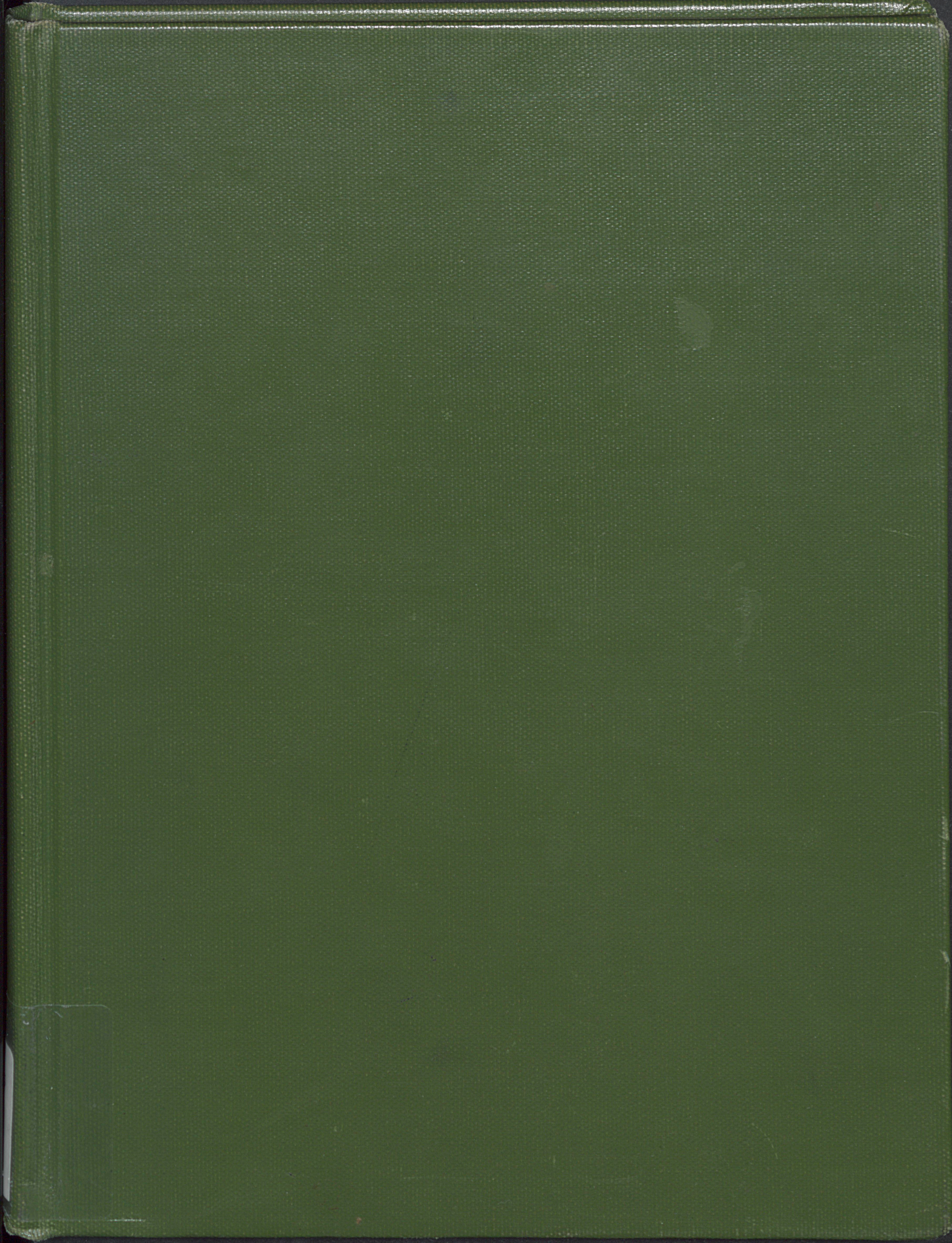




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(BUILDING RESEARCH DATA)
FOR
A CISTERCIAN MONASTERY OF THE STRICT OBSERVANCE

Undergraduate Thesis Project
H. C. Rose, Director and Critic
Department of Architecture
Montana State College

Submitted by
Larry Jay Keller
Winter Quarter, 1964

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LETTER OF TRANSMITTAL

217 West Koch
Bozeman, Montana
March 16, 1964

Mr. H. C. Rose, Director
School of Architecture
Montana State College
Bozeman, Montana

Dear Sir:

I am submitting this "Building Research Data for a Cistercian Monastery of the Strict Observance" as partial fulfillment of the requirements of an undergraduate thesis.

There are two reasons why I chose this project: (1) I wanted to explore a problem that would involve more than mere functional and economical investigation; and (2) I wanted to study something that has not been studied in another thesis as well as something that has not already been studied by other architects. I feel that this project has fulfilled both these qualifications.

Respectfully,

Larry Jay Keller

Check
Summer
used this too

ACKNOWLEDGMENTS

I am deeply indebted to Brother William Giles, O.C.S.D., Abbey of Gethsemani, Kentucky. He has been most generous with his contributions of time and information without which this project would have been impossible. I also would like to extend my thanks to the following faculty members at Montana State College: Professor H. C. Rose, Director of the School of Architecture; and Professor John P. Parker, English Department.

PROLOGUE

A monk is a man who has given up everything in order to possess everything. He is one who has abandoned desire in order to achieve the highest fulfillment of all desire. He has renounced his liberty in order to become free. He goes to war because he has found a kind of war that is peace.

The monk's business is to empty himself of all that is selfish and turbulent and make way for the unapprehended spirit of God. That is his ministry and his whole life: to be transformed into God without half realizing, himself, what is going on. Everybody who is drawn to visit the monastery and who can understand what is happening there comes away with the awareness that Christ is living in those men: "That the world may know that Thou has sent me, and hast loved them as Thou hast also loved me."

Rev. M. Louis (Thomas Merton) O.C.R.

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BAPTISM

HISTORY
FOR A CISTERCIAN MONASTERY OF THE STRICT OBSERVANCE

HISTORY OF THE CISTERCIAN ORDER OF THE STRICT OBSERVANCE

The Founding

Western monasticism had fallen to its lowest ebb by the end of the sixteenth century. The fervor and mysticism of the Middle Ages were gone; with the advent of the idea that life was not so bad, monastic rules had become only talk. This was the time when fasting was neglected and it was rare when a monk arose from a night's sleep before noon. The monks' nights were spent playing cards, bowling, or having what the secular person could only term a party. More than once did a monk spend the night with member of the opposite sex without any forthcoming objections from the Church or his order.

Such was the condition when Arnaud Jean le Bouthillier De Rancé was made commendatory abbot of the monastery of La Trappe in southern France. The monastery was the last thing De Rancé wanted to worry about for he already was a doctor of philosophy, priest, and horseman of notable standing; and he thought with his qualifications he at least deserved a bishopric. But the bishopric he was offered was a small and ineffectual one; so he finally, at the age of 40, decided to see the monastery he had been given.

Upon arrival at La Trappe in 1662, De Rancé was shocked; he should have been because in the whole monastery only the bowling alley, once the kitchen, was in good shape. This immediately made De Rancé decide to take an interest in his monastery and he commanded the five remaining monks to reform while he rebuilt the monastery as it had been.

The reaction of the monks was anything but favorable since they immediately threatened to kill De Rancé if he insisted upon reform. De Rancé determinedly countered by persuading Louis XIV, his personal friend, to pension off the monks to an easy secular life while he handpicked their replacements from another Cistercian monastery.

With De Rancé's new monks, the monastery was repaired and reforms that were to shock the rest of the religious orders were initiated. De Rancé's monks followed St. Benedict's Rule to the letter, thereby having a certain required duty for every hour of the day. They also eliminated all speaking, and replaced it with sign language; and began wearing the coarse wool habit. And the spirit of monasticism was changed by De Rancé encouraging his monks to undertake athletic endurances and feats of fasting.

The other religious orders of the time were quick to voice criticism mainly because they were reluctant to reform; De Rancé was going beyond precedent except possibly the Egyptian monasteries of the fourth century. The other orders pointed out that the Rule of St. Benedict was only initiated to ease the asceticism

of the early Christians and provide a balance between physical work and prayer. They also stated that St. Bernard of Clairvaux, the greatest and most influential monk of the Cistercian Order, had preached against extremes of any kind; however, they admitted he also preached against laxity in the observance of the Rule of St. Benedict. Everyone admitted that St. Bernard was an authority because of his tremendous influence in ecclesiastical matters. After all, he had started a crusade, elected a pope, and banished Abelard from influence in the Church.

De Rancé, not to be outdone, replied to the other religious orders with scorching letters and a book in which he condemned everyone but his monastery. The results went both ways, the other religious orders initiated reforms while De Rancé eased his reforms until they included only the observance of the Rule of St. Benedict and the observance of silence. De Rancé's "contests" were abandoned.

By 1700, De Rancé had well established La Trappe; and he founded ten more monasteries like La Trappe before his death. His novices ranged from princes to common laborers, the bulk being soldiers who seemed to think De Rancé's monastery was more of a challenge than war.

De Rancé's reform did away with the causes of the Cistercian decline in the Middle Ages after the death of St. Bernard by making monks pledge poverty and obedience and stick to such vows. No longer could monasteries become rich and influential

in secular affairs and thereby lose identity as monasteries.

At De Rancé's death, the reformed monks became to be called the Trappists or, more specifically, the Cistercians of the Strict Observance to separate them from the regular Cistercian Order.

By 1750, the Trappists were growing at an exciting rate and the future looked very bright. But by 1789, the French Revolution was sweeping over France; soon the apostate Bishop of Autun, Talleyrand, would call for confiscation of the property of the religious orders and the "liberation" of the monks.

The Effect of the French Revolution

Naturally some monks, the monks that never lived like monks, welcomed the Revolution's order and loudly voiced their opinion to the French General Assembly in Paris. The Trappists, feeling secure, did nothing.

Soon, the French Government had various committees entering Trappist monasteries all over France to investigate or more realistically, to inventory the land they were soon to confiscate. However, the Trappists made a very favorable impression on the inspection committee which was marvelled to see the monastery was very simple and austere, the only wealth made beyond its means being given, as St. Bernard had suggested, to the poor.

The committee's report saved the Trappist monasteries; but, nevertheless, the General Assembly decided that no new novices could be taken in at any of the Trappist monasteries, thereby

ridding France of Trappists. The Trappists could not bear such an end after suffering to establish the new order so a certain Father Augustine took twenty monks and crawled past border guards into Switzerland to establish the Trappist monastery of La Val Sainte in 1791.

In France, meanwhile, the extremes of the Revolution did not honor the previous government's promise and the monasteries were seized, the monks who were not able to escape were sent to France's infamous penal colony in French Guiana. The escaping monks fled to Holland, Belgium, Germany and Russia.

By 1810, even La Val Sainte was slowly dying because of the lack of novices due to the strong Calvinistic feelings in Switzerland. The decision was to go to America where a Kentucky Bishop named Flaget was in need of some "sensible" religious people to combat the numerous radical sects that were thriving.

The Trappists in America

Dom Urban Gillet was given the command of forty monks in Amsterdam for the specific purpose of finding a monastic establishment in America. Gillet, a wild and rugged adventurer anyway, survived the rough crossing and immediately set for Kentucky after surveying Maryland and Pennsylvania.

When Gillet reached Louisville, it was only a village of around 120 log cabins and fifteen religious sects. The most famous of the sects were the Phillestines who, among other things, played marbles as a practical application of

the text: "Unless you become children, you shall not enter the kingdom of heaven." The shock was great to all the Trappists; they decided it was here that they should establish the colony.

The Colony started with much success and seemed to progress until a fire burned down every building, including the watch-making shop the Swiss Trappists had established to raise the income of the monastery. The only thing to do was to start over again or to abandon the 800 acres. Gillet decided to head for new lands and the colony went west to St. Louis to found a second monastery.

By this time France did another about-face and the Trappists became to be welcomed under the monarchy that had replaced Napoleon. Eager to return home, Gillet and his monks arrived in Le Harve in 1818.

Monasteries began to thrive again in France, especially the Trappist order; and soon new monasteries were again being planned. This time, however, the Revolution of 1830 came to France; the monks, fearing an eventual return of the confiscation practices of the first revolution, started planning a second expedition to America. The Trappist fears never materialized; but, since a new colony was now needed anyway, it was decided America was to be the place. This time a Father Eutropius Proust took forty-four monks of all ages in a ship filled with gold-hungry miners to New Orleans and then up the Mississippi and Ohio Rivers to the same site in Kentucky that Dom Gillet had founded.

This establishment was much more secure mainly because of the wise direction of Father Proust. The colony continued to prosper and in 1918 a new stone monastery replaced the temporary wood shelter. This same stone building is the Abbey of Gethsemani, the same Gethsemani that is considering Miles City, Montana as a location for one of its sister monasteries.

SPECIAL CHARACTERISTICS OF A CISTERCIAN MONASTERY OF THE STRICT OBSERVANCE

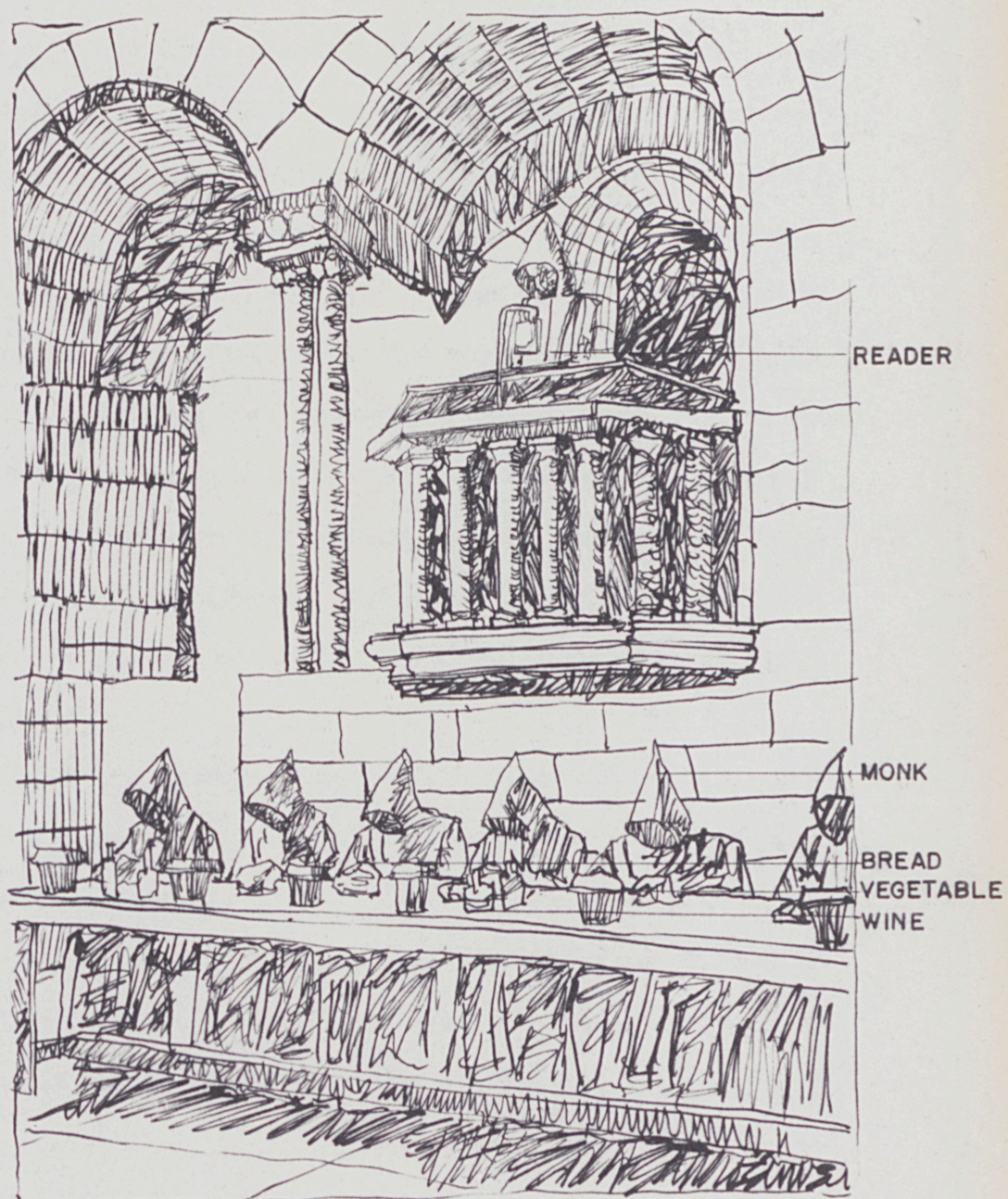
THE ROLE OF THE RULE OF ST. BENEDICT

Intention of the Rule

The Rule of St. Benedict that is followed in all Trappist monasteries was not intended to be, and as a matter of fact was not, one of great austerity when judged by the standards of when it was written. St. Benedict allowed his monks proper clothes, sufficient food, and ample sleep. The only bodily austerities were the abstinence from flesh meat and the unbroken fast until mid-day. (See Fig. 1) The midnight office was not part of St. Benedict's Rules, the time for rising being 1:30 to 3:00 a.m. according to the season. The monks, therefore, had unbroken sleep for $7\frac{1}{2}$ or even 8 hours, except in hot weather when, in compensation, they were allowed a siesta after the mid-day dinner. The canonical office was chanted throughout the day but these duties did not take over five hours. The remaining hours of the day were divided between working and reading, in the proportion of about six hours to four hours. The reading was generally from the Bible and monastic authorities. The work, being field work, was needed to support the monastery.

Structure of the Rule

The Rule, as it was written down, consisted of a prologue and 73 chapters. Though it has resisted all attempts to reduce



ORVAL MONASTERY, FRANCE

FIG. 1. A TRAPPIST MEAL
(16:129)

it to an ordered scheme, and probably was not written on any set plan, still it is possible to roughly indicate its contents. The prologue and introductory chapter explain the intentions of the Rule. This is followed by instructions to the abbot in governing his monastery (2,3); next comes the ascetical portion of the Rule, on monastic virtues (4-7); then the regulations for the celebration of the canonical office which St. Benedict calls "the work of God," his monks first duty "of which nothing is to take precedence" (8-20); faults and punishment (23-30); the cellarer and property of the monastery (31-32); community of goods (33-34); various officials and daily life (21,22,35-57); reception of monks (58-61); and miscellaneous (62-73).

The Trappists have added two sections to the Rule: (1) the observance of complete silence except for the transaction of business (See Fig. 2); and (2) the wearing of the white robe with a black scapular (See Fig. 3). The daily schedule of a modern Trappist monk follows in Table 1. The schedule is explained in detail under the section titled Required Duties for a Monk.

HIERARCHY OF THE TRAPPISTS

General

The structure of Trappist society also follows the Rule of St. Benedict. The monk first serves two years as a novice.



MASS



FEVER



GOD



COFFEE



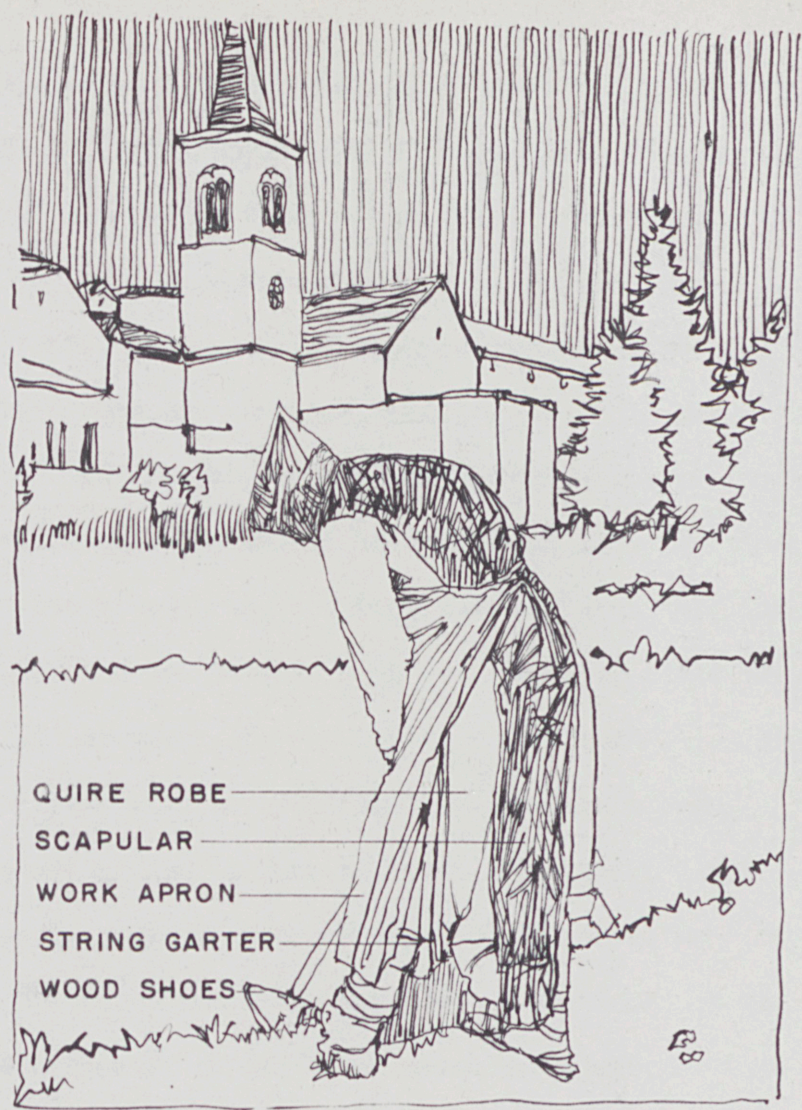
EAT



DAY

FIG. 2. TRAPPIST SIGN LANGUAGE

(16:129)



QUIRE ROBE

SCAPULAR

WORK APRON

STRING GARTER

WOOD SHOES

WORK DRESS



QUIRE ROBE

SCAPULAR

CHURCH DRESS



NORMAL DRESS

FIG. 3. TRADITIONAL TRAPPIST DRESS
(16:132)

During this period he splits his life between: (1) the study of the rules of the Trappists; and (2) the obligations required of a novice. The obligations are: (1) to assist daily at Holy Mass; (2) to say a Rosary; and (3) to read the scriptures. After the second year, the noviciate chooses temporary vows for three years. These vows are poverty, charity, and obedience.

At the end of the temporary vows, the noviciate may go back to the secular world or remain as a monk for life by taking perpetual vows of poverty, charity, and obedience. If the noviciate prefers not to take perpetual vows yet still wants to serve the monastery, he may become a lay-brother. A lay-brother observes all the rules that the monks observe.

The highest office is that of abbot. The abbot is elected by the community of monks by secret ballot. Assistants to the abbot are the prior and sub-prior who are appointed by the abbot. Most elected abbots have served as priors but this does not have to be the case. The prior and sub-prior are also subject to the orders of the abbot.

The abbot governs with full and unquestioned authority. Nevertheless, on important matters he must consult the whole community and hear what each one, even the youngest, thinks. On matters of limited concern, he should consult only the elder monks. Moreover, he has to govern in accordance with the Rule and must endeavour not to overdrive his monks.

REQUIREMENTS FOR A TRAPPIST MONK

General

The requirements to become a Trappist monk are:

- (1) Age—between 16 and 50 years;
- (2) Right intention (willingness to observe rules);
- (3) Baptismal and confirmation certificates;
- (4) Reasonably good health;
- (5) A docile, willing spirit.

The Trappists require no dowry but material gifts are appreciated.

The location of all Trappist monasteries follows in Fig.

4.





CONFIRMATION

conditions creating a need

CONDITIONS CREATING A NEED
FOR A CISTERCIAN MONASTERY OF THE STRICT OBSERVANCE

GENERAL CONDITIONS

The Roman Catholic Church

The Roman Catholic Church has always recognized the Cistercian Order of the Strict Observance (Trappists) as an important element in Catholic society. Pope Pius XI summed up the Church's position in his "Umbtatilem" (Apostolic Constitution of July 8, 1924, approving the Statutes of the Cistercians):

"Cistercians give themselves up to a sort of hidden and silent apostolate....We with that so valuable an institution should spread and increase. For if ever it was needful that there should be anchorites of this sort in the Church of God, it is especially expedient nowadays when we see so many Christians..giving rein to their desire for earthly riches and the pleasures of the flesh.... But it is easy to understand how those who assiduously fulfill the duty of prayer and penance contribute much more to the increase of the Church and the welfare of mankind than those who labor in tilling the Master's field." (9 : 15)*

Furthermore, the Roman Catholic Church has always materially encouraged growth of the Trappists by purchase of the land for the monastery and by financial help during the initial building stages. The practice of monks building their own monastery, as in St. Bernard's day, has long been abandoned. In return for

* The first number in parenthesis refers to the number of the book listed in the reference section. The second number, also in parenthesis, refers to the page number or numbers consulted. (The reference page folds out for ease in reading.)

the Roman Catholic Church help, the Trappists have always consulted the Apostolic Delegate in Washington, D. C., before establishing a new monastery. The latest request by the Abbey of Gethsemani of Trappist, Kentucky, brought the following response from Jean-Marie Canevey, present Apostolic Delegate:

"The Apostolic See is happy to allow your request for the establishment of yet another monastic institution . . . The attitude of the Church (Roman Catholic) will continue to be one of service and help." (27 : 2)

PHYSICAL CONDITIONS

Expansion Doctrine of the Gethsemani Abbey

The Gethsemani Abbey of Kentucky has always solved overcrowded problems by establishing new monasteries. When overcrowded conditions existed in 1944, our Lady of the Holy Ghost was founded on an old plantation near Conyers, Georgia, twenty miles from Atlanta. Although this relieved Gethsemani of 90 monks, the abbey reached the same overcrowded position in 1945 from the invasion of World War II veterans. Therefore, in 1946, a second monastery, Our Lady of the Most Holy Trinity, was built near Huntsville, Utah, to handle 100 of Gethsemani's monks.

As growth continued throughout the 1950's, two more monasteries from Gethsemani came into existence: (1) Our Lady of Guadalupe near Lafayette, Oregon, in 1951; and (2) Our Lady of New Melleray near Dubuque, Iowa, in 1955. They both have

have a capacity of 100 monks. The following map in Fig. 5 shows precise location of monasteries founded by the Gethsemani Abbey:

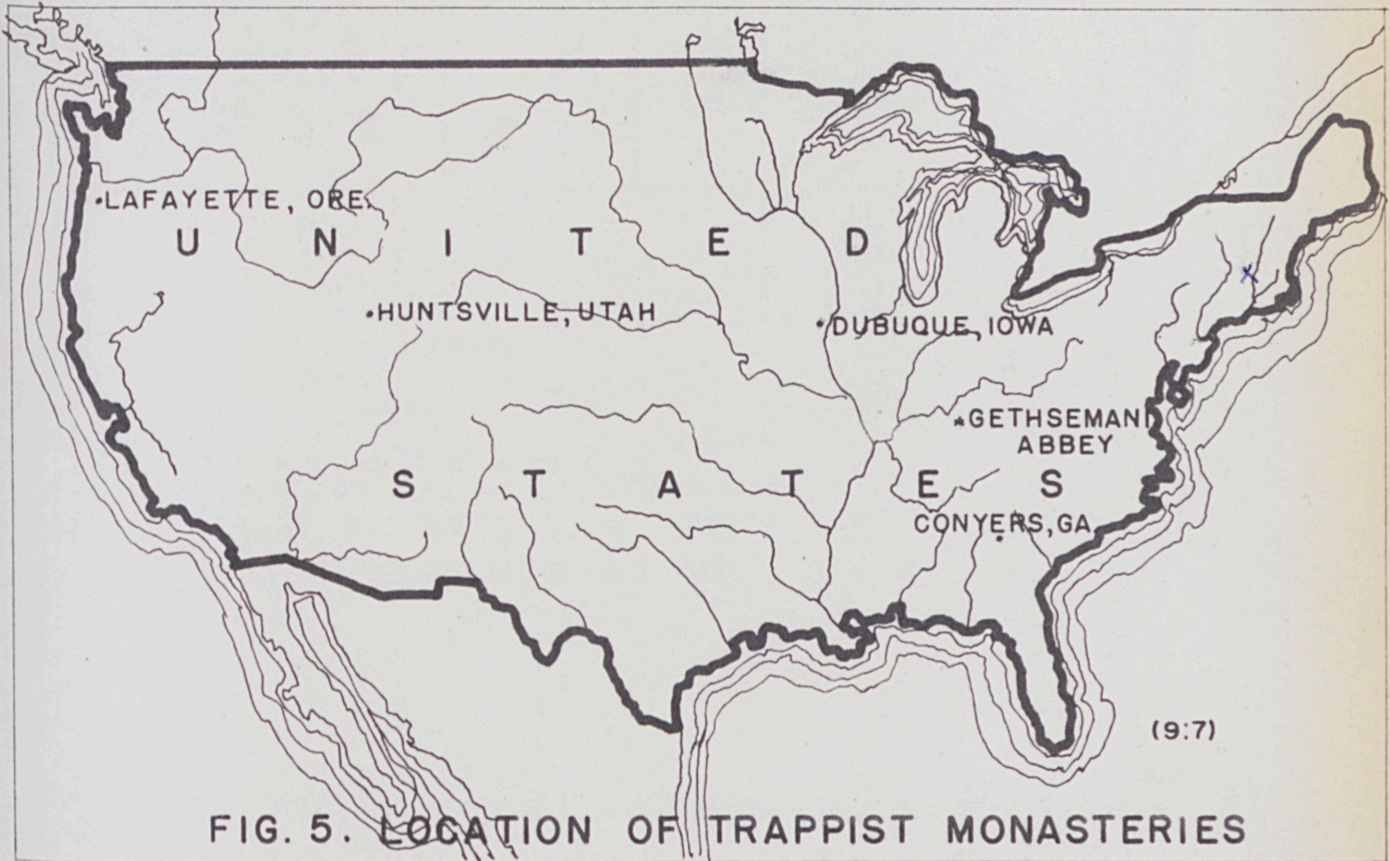


FIG. 5. LOCATION OF TRAPPIST MONASTERIES

Since conditions are again in an overcrowded state, Gethsemani Abbey plans to solve the problem, like all previous ones, by the establishment of a new monastery. (27 : 3)

Overcrowded Conditions at Gethsemani

Today, the Gethsemani Abbey has over 200 monks and novices in a building designed to comfortably house 120 monks. (See Fig. 6). In addition, novices are coming to Gethsemani at the average of one every three weeks. Rarely does a novice leave the Gethsemani Abbey.

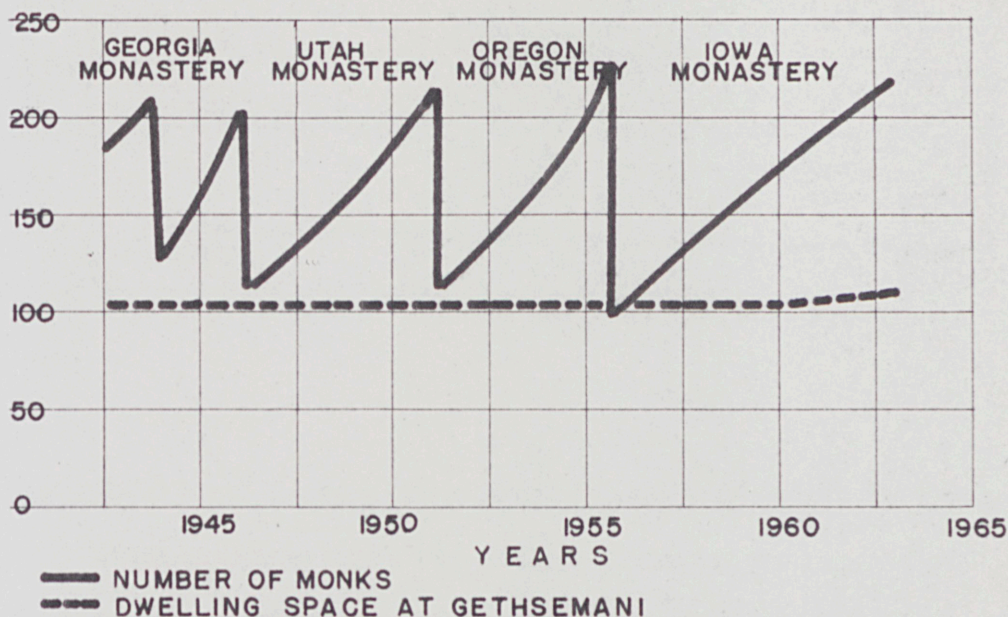


FIG. 6. DWELLING SPACE VS. NUMBER OF OCCUPANTS AT GETHSEMANI, KY.

(27:2)

The Monastic cells have been cut in half, eliminating a usual holy water stoup for every monk. The worst drawback of overcrowding is that there is not enough agricultural work to keep all busy as St. Benedict specified in his Rule. The following sketches in Figs. 7 and 8 help convey this condition;

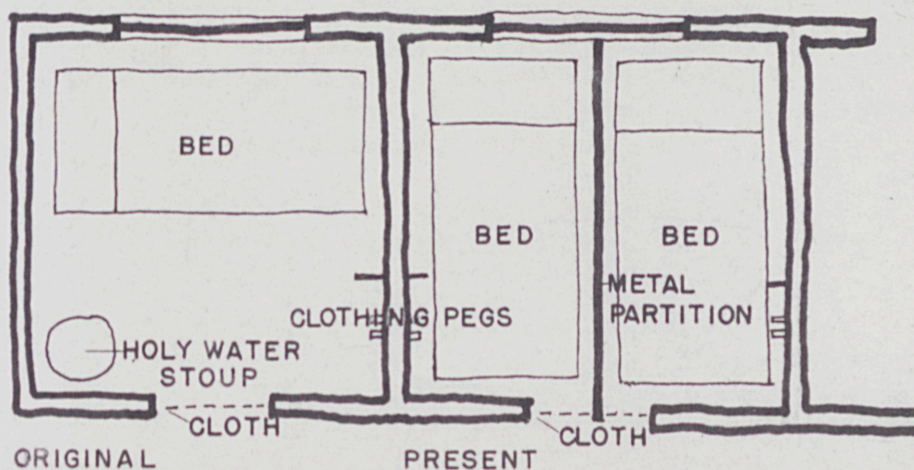


FIG. 7. OVERCROWDING AT GETHSEMANI.

(27:3)

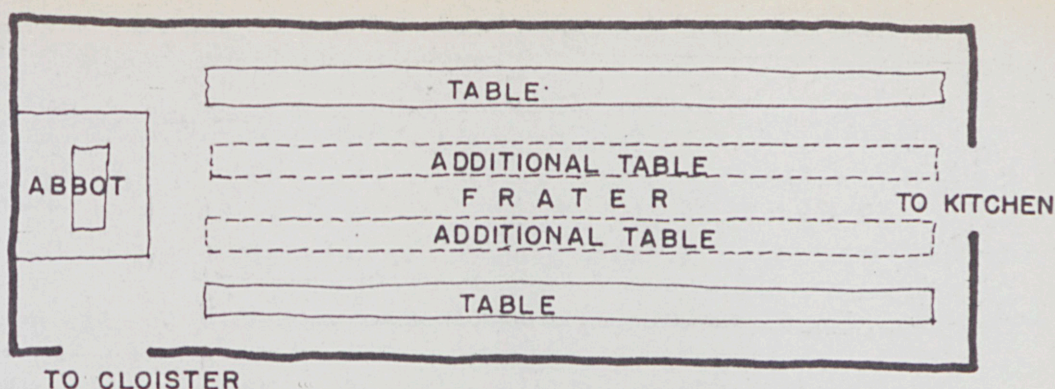


FIG. 8. OVERCROWDING AT GETHSEMANI.

(27:3)

Desirability of Montana as a Location for a Trappist Monastery

Correspondence with the Gethsemani Abbey revealed that Montana is considered a proposed area for any new monastery.

The following reasons were given for the selection:

1. Montana's climate allows the monks to wear the traditional Trappist habit without "undue" discomfort. The Rule of St. Benedict makes "no provision" for lighter clothing, only a provision for more clothing in the form of a scapular to be used during work and cold weather. Trappist establishments in milder climates have proven that the monks must neglect work on hot days because of the wearing of the habit.
2. Montana has a low population for its size, providing isolated areas for monastic life.
3. Montana primarily has an agricultural economic basis similar to that required by Trappist monasteries. The crops grown in Montana also follow the requirements of the Rule of St. Benedict; that is, beans, peas, carrots, tomatoes, and wheat for bread and mild beer. A Trappist Monastery must be self-sufficient.
4. Montana has a "young, rugged" terrain that is in perfect accordance with the Trappist life.

(27 : 3)

PSYCHOLOGICAL CONDITIONS

Size

Although large monasteries would be a solution to overcrowding at Gethsemani; they, nevertheless, would not be a healthy condition. The evils of large monasteries were, in fact, one of the reasons for the reforms by St. Benedict; he saw that the large monasteries of Egypt produced a life that was "too complex, too noisy, too active." (3 : 23) Labor for the monks had become so mechanical that it resembled a production line rather than individual monks farming. All life was depersonalized; instead of real spiritual direction, the monks were subjected to a system of formal regulations and there was no intimate contact with superiors.

St. Benedict's reforms were to have his monks keep a simple, natural life, his rule being a summary of that life; and, from such a life, a pure contemplation of God was proven possible.

The graph of Fig. 9 shows that the Cistercians took up the practice of building large monasteries during the thirteenth and fourteenth centuries. A swift decline was the result. Ever since the Trappist reforms, large size has been avoided as a detriment to contemplative life.

Gethsemani, by charter, has limited building sizes to a maximum capacity of 120 monks. (6 : 20) This figure is well under the 2000-2500 capacities of the monasteries during the

Cistercian decline. Gethsemani's program of building new monasteries has provided growth without size.

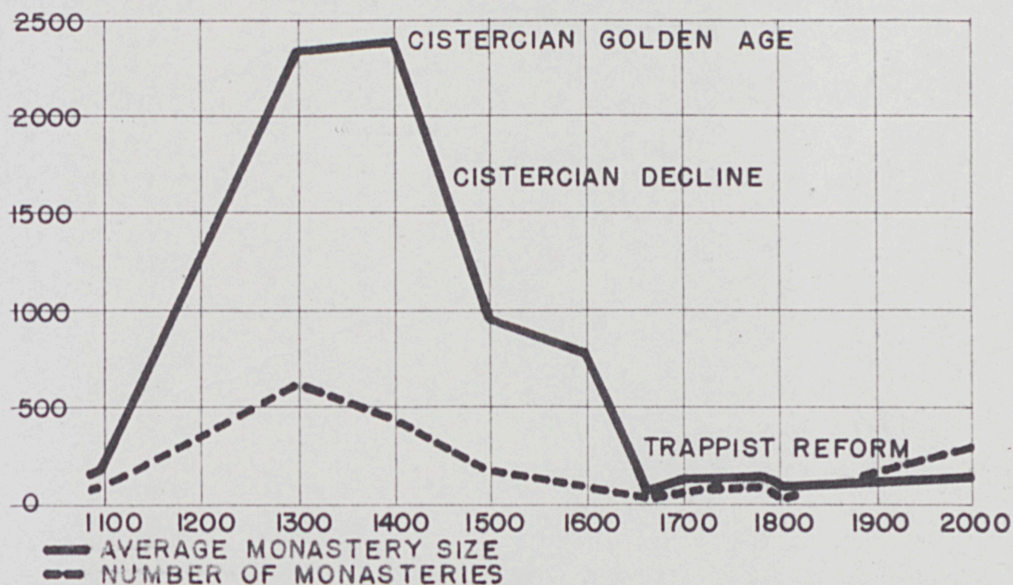


FIG. 9. AVERAGE SIZE OF CISTERCIAN MONASTERIES COMPARED TO THE NUMBER OF CISTERCIAN MONASTERIES.

(9:10)

Overcrowding

Overcrowding has approximately the same effect as size in that it depersonalizes monastic life. It has a further drawback in that it disrupts the observance of the Rule of St. Benedict, all important to the Cistercian contemplative life.



HOLY EUCHARIST

local conditions

LOCAL CONDITIONS
FOR A CISTERCIAN MONASTERY OF THE STRICT OBSERVANCE

GEOGRAPHICAL

General

The monastery would be located near Miles City, Montana; latitude 46°40' and longitude 105°70', at an elevation of 2,364 feet above sea level.

The city of Miles City has a population of approximately 10,200. It is located on the Yellowstone River at its junction with the Tongue River. The land is composed of plateaus and undulating plains. Hills are located to the east and west of Miles City but only of elevations approximately 300 feet higher. The nearest town is Terry, Montana, at a distance of 38 miles. The nearest town of over 5,000 people is Glendive, which is 80 miles from Miles City.

CLIMATE

Growing Season and Crops

The climate of Miles City allows an average growing season of approximately 158 days. The first day of killing frost usually falls between September 25 and October 5. The last day of killing frost usually falls between May 5 and May 25. The climate is ideal for the growing of wheat, beans, barley, and alfalfa for hay and seed. All types of vegetables are

easily grown but only in irrigated areas. Fruit production is limited to apples, plums, and various kinds of berries.

The average yield of crops for the Miles City area is as follows for an average growing season:

CROP	VARIETY	YIELD PER OZ. OF SEED
VEGETABLE		
BEANS	PENCIL POD BLACK WAT	1/2 BU.
BEETS	DETROIT DARK RED	3 BU.
CABBAGE	DANISH BALLHEAD	6 BU.
CARROTT	CHANTENAY	2 BU.
SWEET CORN	GOLDEN CROPS BANTAM	1/2 BU.
CUCUMBER	CHICAGO PICKLING	4 BU.
LETTUCE	MIGNONETTE	3 BU.
ONION	SWEET SPANISH	1 BU.
PEAS	LINCOLN	1/4 BU.
POTATOES	RED PONTIAC	10 BU.
SPINACH	NEW ZEALAND	2 BU.
SQUASH	ARIKARA	12 BU.
TOMATOE	DOUBLE RICH	1 PLT.=3 BU.
FRUIT		YIELD PER PLANT
APPLE	HARALSON	6-10 BU.
PLUMS	TECUMSEH	1-3 BU.
RASPBERRIES	LATHAM RED	2 QT.
STRAWBERRIES	DUNLAP	1/2-1 QT.
GOOSEBERRIES	NEW WELCOME	2 QT.
CHERRIES	WILD CHOKE	1/2-1 BU.
FIELD CROPS		YIELD PER ACRE
BEANS (DRY)	NAVY WHITE	1 TON +
WHEAT	JUSTIN	40 BU.
BARLEY	BETEZES	80 BU.
ALFALFA (HAY)	RANGER	3 TON
SUGAR BEETS		4-6 TON

NOTE: ALL YIELDS ARE FOR IRRIGATED LAND EXCEPT WHEAT & BARLEY.

TABLE 2. AVERAGE CROP YIELDS FOR
MILES CITY, MONTANA

(30:2)

Other principle agricultural products are cattle, sheep, and poultry. The production figures depend upon the feed from the crops of the preceeding year. Average production figures are as follows;

PRODUCT	LAND REQUIRED		YIELDS
	IRRIGATED	DRY	
BEEF CATTLE	1 1/3'	1/3	GAIN IN WT. PER. 6 MO. 600 LBS.
SHEEP	5/12	1/12	40-50 LBS.
POULTRY	3 LBS. WHEAT PER DAY		

' SEE ECONOMICS FOR LAND BREAK-UP

TABLE 3. AVERAGE PRODUCTION
FIGURES FOR CATTLE, SHEEP, AND
POULTRY FOR MILES CITY, MONTANA
(30:3)

The predicted crops and quantity of crops for the monastery are outlined in detail in the section titled Economics.

Temperature

The annual average temperature for the Miles City area is 48°. The average monthly temperatures follow in the graph of Fig. 10.

Extreme temperatures are not unusual, but they rarely last over a 10-day period. The maximum average temperature from April to September is 87°F., the minimum being 67°F. The maxi-

imum average temperature from September to April is 36°F. , the minimum average being 10°F. (23 : 38)

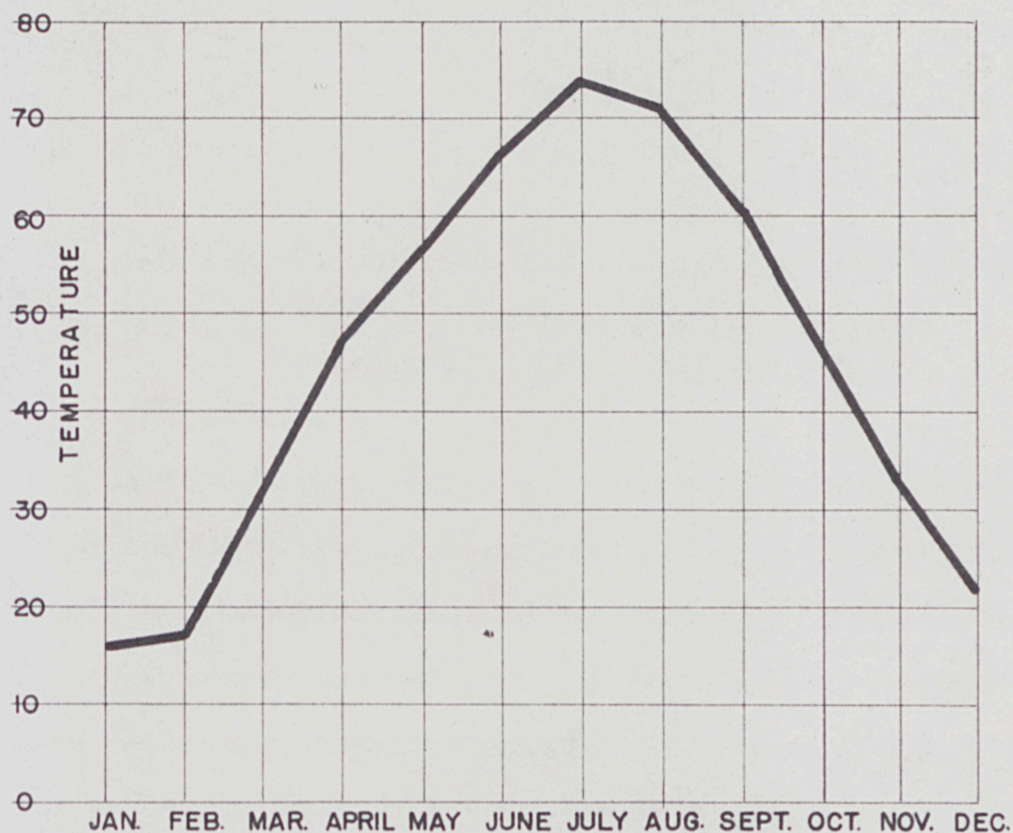


FIG. 10. MEAN TEMPERATURE FOR
MILES CITY, MONTANA

(23:5)

Precipitation and Humidity

Miles City usually has very dry years although recent years have shown an increase in moisture. Precipitation is usually about 14 inches annually, June being the month for the most moisture, December being the driest month. The average number of inches of rainfall per month is graphed in Fig. 11.

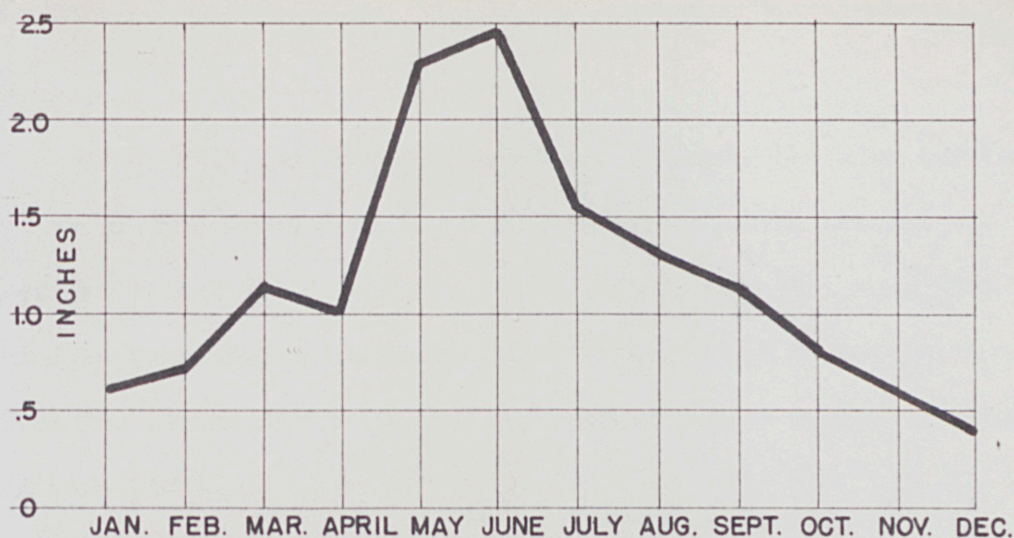


FIG. II. MEAN PRECIPITATION FOR
MILES CITY, MONTANA

(23:6)

Snowfall is quite light, the number of days with snow cover being limited to about 85 days. Most winters are comparatively snow free, the average amount of snowfall being 10 to 15 inches.

Hail has not occurred during the last two years; nevertheless, hail damage is quite frequent. Outlying areas have been hit as recently as 1963 when crop damage alone was over \$5 million. (28 :) Hail insurance now covers over 60% of the Miles City area farmers. (28 :)

Humidity in Miles City is not a problem, averaging 29% during the summer. However, a rainfall of 5 to 6 inches in the spring causes humidity ranges from 75 to 85%. During humid conditions, mosquitoes and grasshoppers become an ever-increasing problem. Aerial or ground spraying becomes necessary by June. Other insects, such as alfalfa weevil, always need control regardless of the humidity.

Wind

Miles City has few wind problems, although the wind has been known to reach 80 mph at least once a summer. The average velocity of wind is 6 to 8 mph. The direction of the prevailing wind is from the southeast during the spring and summer months, from the northeast during fall and winter. Wind damage to crops is very light.

Sunshine and Sun Angles

Sunshine is probably Miles City's greatest asset, the city being sited as having more days of sunshine than any other Montanan city. The average hours of sunshine and sun angles follow respectively in Figs. 12 and 13.

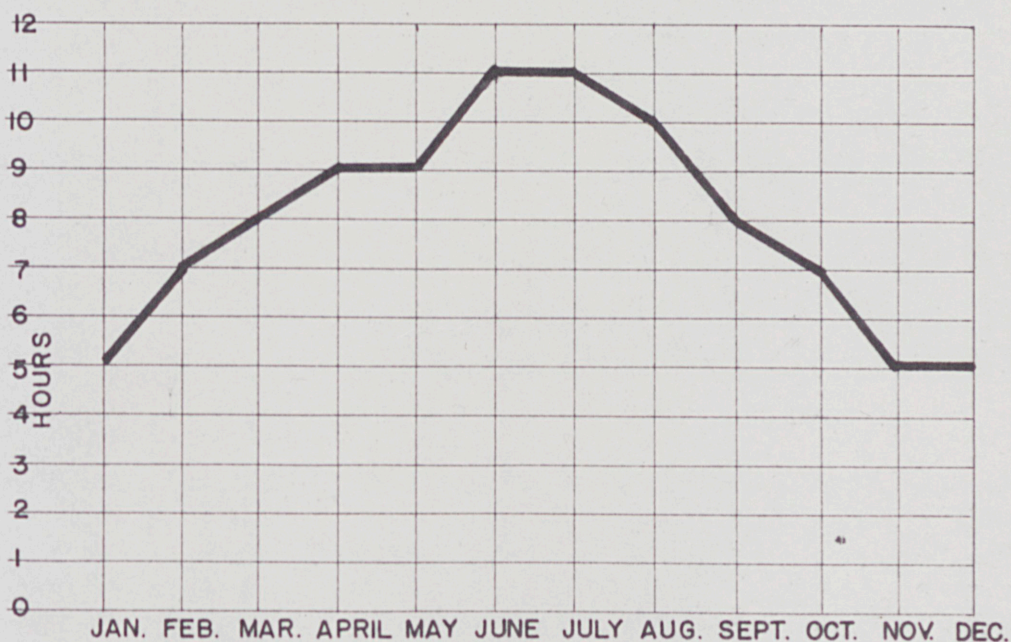


FIG. 12. AVERAGE HOURS OF SUNSHINE
PER MONTH FOR MILES CITY, MONTANA
(22:40)

EXPLANATION

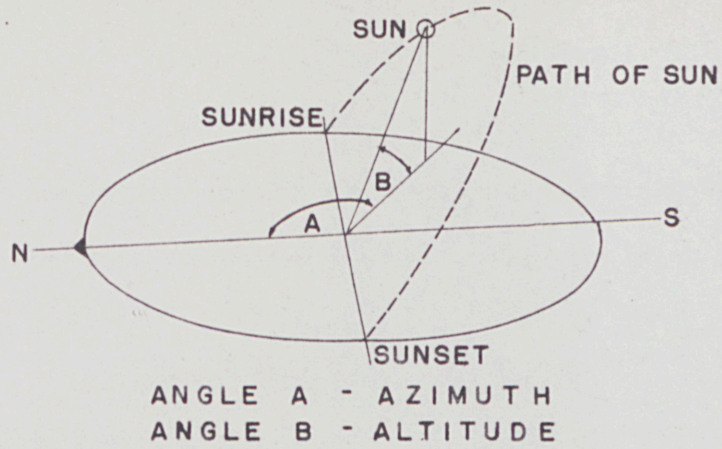
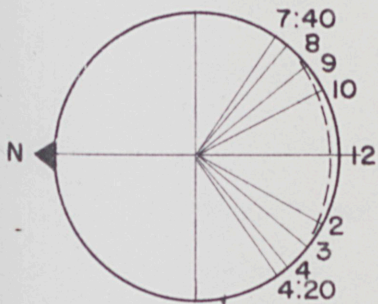
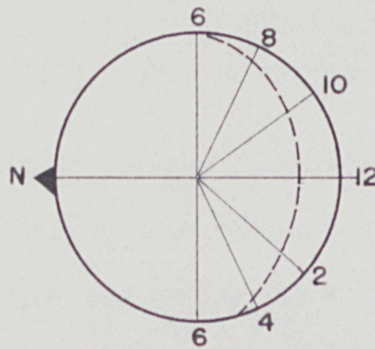


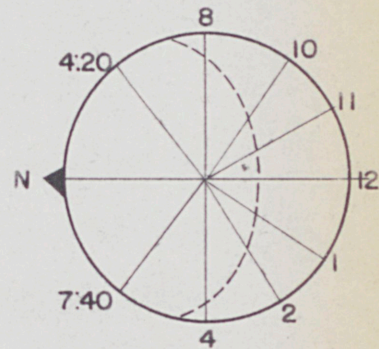
FIG. 13. SOLAR ANGLES FOR MILES CITY, MONTANA



WINTER
DEC. 22



SPRING - MAR. 21
FALL - SEPT. 23



SUMMER
JUNE 22

A.M.	AZIMUTH	ALTITUDE	A.M.	AZIMUTH	ALTITUDE	A.M.	AZIMUTH	ALTITUDE
7:40	124° 30'	0° 0'	6:00	90° 0'	0° 0'	4:20	55° 30'	0° 0'
8:00	127° 30'	2° 30'	8:00	112° 0'	20° 30'	8:00	93° 0'	37° 39'
9:00	139° 0'	10° 0'	10:00	141° 0'	38° 0'	10:00	121° 30'	57° 30'
10:00	151° 30'	16° 0'	NOON	180° 0'	45° 0'	11:00	145° 30'	65° 30'
NOON	180° 0'	21° 30'				NOON	180° 0'	68° 30'
P.M.			P.M.			P.M.		
2:00	151° 30'	16° 0'	2:00	141° 0'	38° 0'	1:00	145° 30'	65° 30'
3:00	139° 0'	10° 0'	4:00	112° 0'	20° 30'	2:00	121° 30'	57° 30'
4:00	127° 30'	2° 30'	6:00	90° 0'	0° 0'	4:00	93° 0'	37° 39'
4:20	124° 30'	0° 0'				7:40	55° 30'	0° 0'

ECONOMICS

General

Economically, Miles City is chiefly an agricultural area. The main cash value crops are listed in the following Table 4.

CASH VALUE CROPS	% OF INCOME
LIVESTOCK - INCLUDING FEED SUCH AS ALFALFA	
CATTLE AND CALVES	44.0%
SHEEP AND LAMBS (1.1% OF TOTAL IS WOOL)	3.8%
CROPS - NOT INCLUDING LIVESTOCK FEED	
WHEAT	30.8%
BARLEY	5.7%
DRY EDIBLE BEANS	4.6%
SUGAR BEETS	2.2 %
OATS AND OTHER CROPS	8.5%

TABLE 4. MAIN CASH VALUE CROPS
FOR MILES CITY, MONT.
(20:5)

Cattle and wheat are raised annually while crops, such as barley, oats, and alfalfa, are rotated depending upon soil conditions, market values, and spring rainfall. The average number of acres of irrigated land needed to support a person is about five acres. The average farming income is approximately \$5,800. (20 : 4) A complete economic breakdown occurs in the section titled Economics.

SOCIAL AND HISTORICAL CONDITIONS

General

Miles City, in 1881, was colorfully described by a local

writer as the "most wicked city in the United States." (33 :) According to other past accounts he probably was right. This brought together a plea from the "law-loving citizens" for a community of nuns to "instill Christian attitudes" in the population. In 1884, 42 nuns from the Roman Catholic Ursuline order established a convent in Miles City. Later, a Roman Catholic Church and school were founded to supplement the successful nunnery.

Today, the Miles City Roman Catholic Church has approximately 2,500 affiliated members; the Catholic high school graduates approximately 20 students every year. Probably because of the "good work" of the first nuns, no religious problems have ever arisen between the Roman Catholic and Protestant citizens. The hospital, serviced by Roman Catholic nuns, also helps the relationship between religious sects. Miles City now has the churches sited in Table 5.

All religious denominations hold to an individualistic attitude if at all possible; political tempers are expressed in a somewhat conservative vein. Farmers are well-received by Miles Citians and vice-versa.

The population of Miles City is growing, but not to any unusual extreme (12% growth rate). A monastic establishment has little threat from being overrun by commercialized interests. Fig. 13 gives present and predicted population figures for Miles City, the Map in Fig. 14 shows the directions in which Miles City is growing.

NO.	CHURCH TITLE	ADDRESS	SIZE
1	SACRED HEART CHURCH	MONTANA & PALMER	2,500
2	ASSEMBLY OF GOD	LEIGHTON & N. CENTER	200
3	CONSERVATIVE BAPTIST	20 NORTH STACY	150
4	FIRST BAPTIST	10TH ON PALMER	250
5	SOUTHERN BAPTIST	520 NORTH LAKE	150
6	AMERICAN UNION	820 WOODBURY	50
7	BIBLE CLUB ASSEMBLY	620 NORTH 3RD	50
8	FIRST CHRISTIAN	MAIN AND LAKE	250
9	CHURCH OF CHRIST	WINCHESTER AVE.	100
10	1ST CHURCH OF CHRIST SCIE-	MIL. WOMENS CLUB	25
11	CHURCH OF GOD	LAKE AND MAIN	300
12	CONGREGATIONAL	1006 S. STREVELL	300
13	JEHOVAH'S WITNESSES	101 N. STREVELL	50
14	EPISCOPAL	11TH AND PALMER	400
15	PRESBYTERIAN	1401 MAIN	600
16	LATTER DAY SAINTS	100 SOUTH LAKE	200
17	LUTHERAN (A.L.C.)	2200 STOWER	600
18	LUTHERAN (MO. SYN.)	CENTER AND PEARL	400
19	METHODIST	11TH AND PLEASANT	600
20	WESLEYAN METHODIST	910 GARLAND	150
21	7TH DAY ADVENTIST	520 N. LAKE	300

TABLE 5. CHURCH AFFILIATION OF
MILES CITY, MONTANA

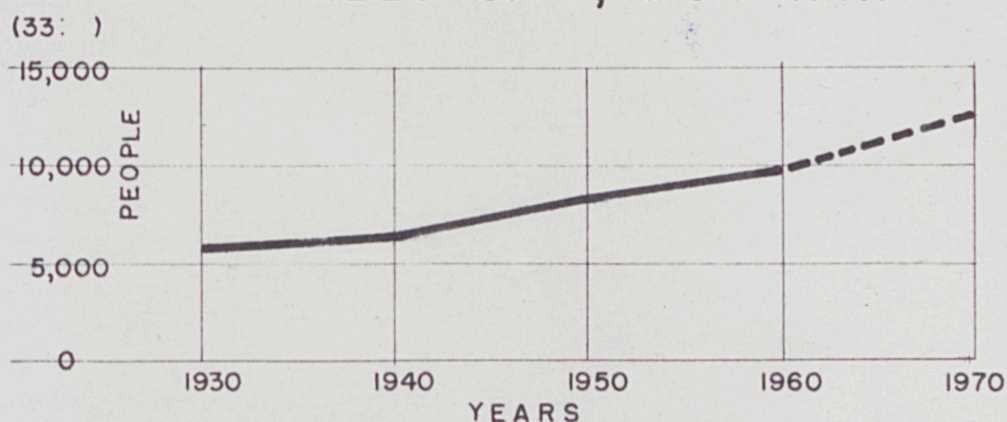
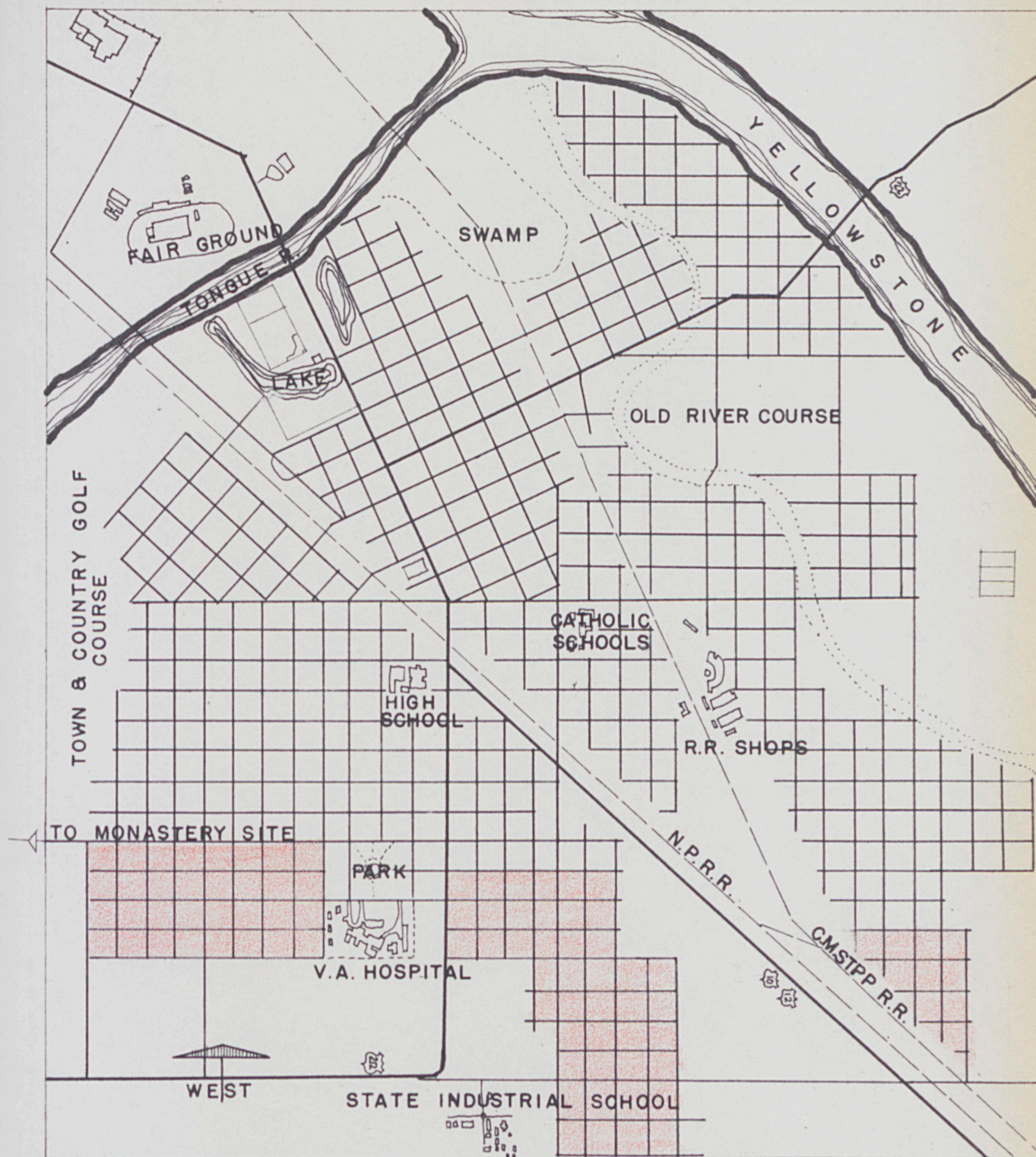


FIG. 13. PRESENT AND PREDICTED
POPULATION FOR MILES CITY

(33:)

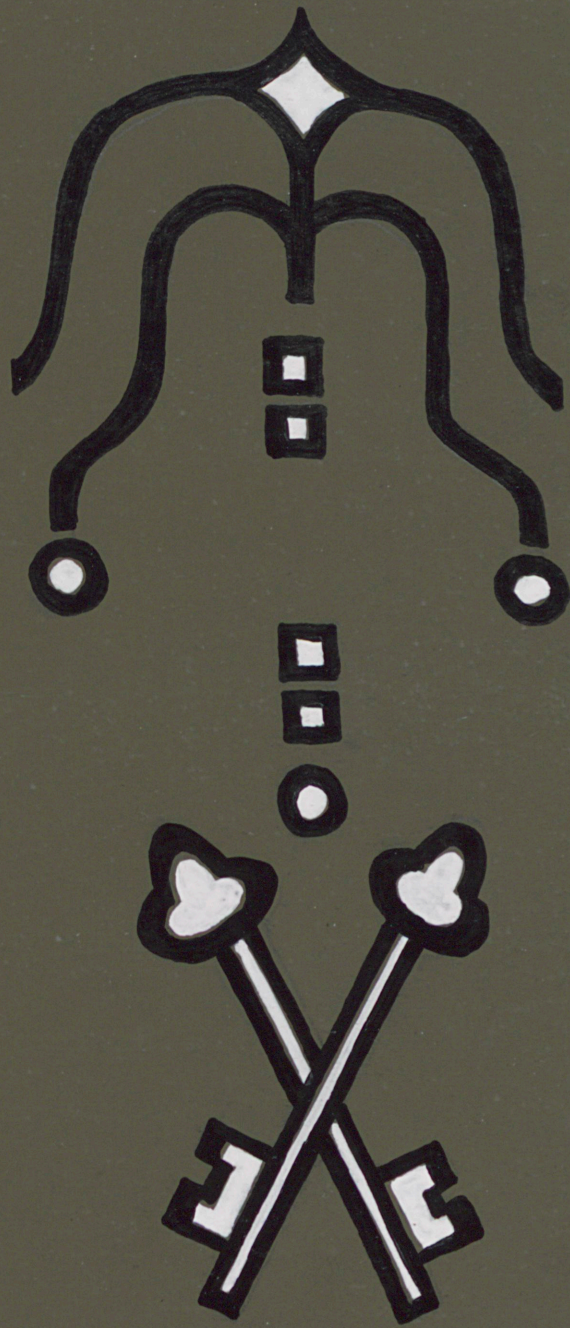


SCALE 0 1 2 FEET X 10³

KEY NEW SUBDIVISIONS SINCE 1955

FIG. 14. GROWTH PATTERNS OF MILES CITY, MONTANA SINCE 1955

(33:)



PENANCE

SITE ANALYSIS
FOR A CISTERCIAN MONASTERY OF THE STRICT OBSERVANCE

CONDITIONS

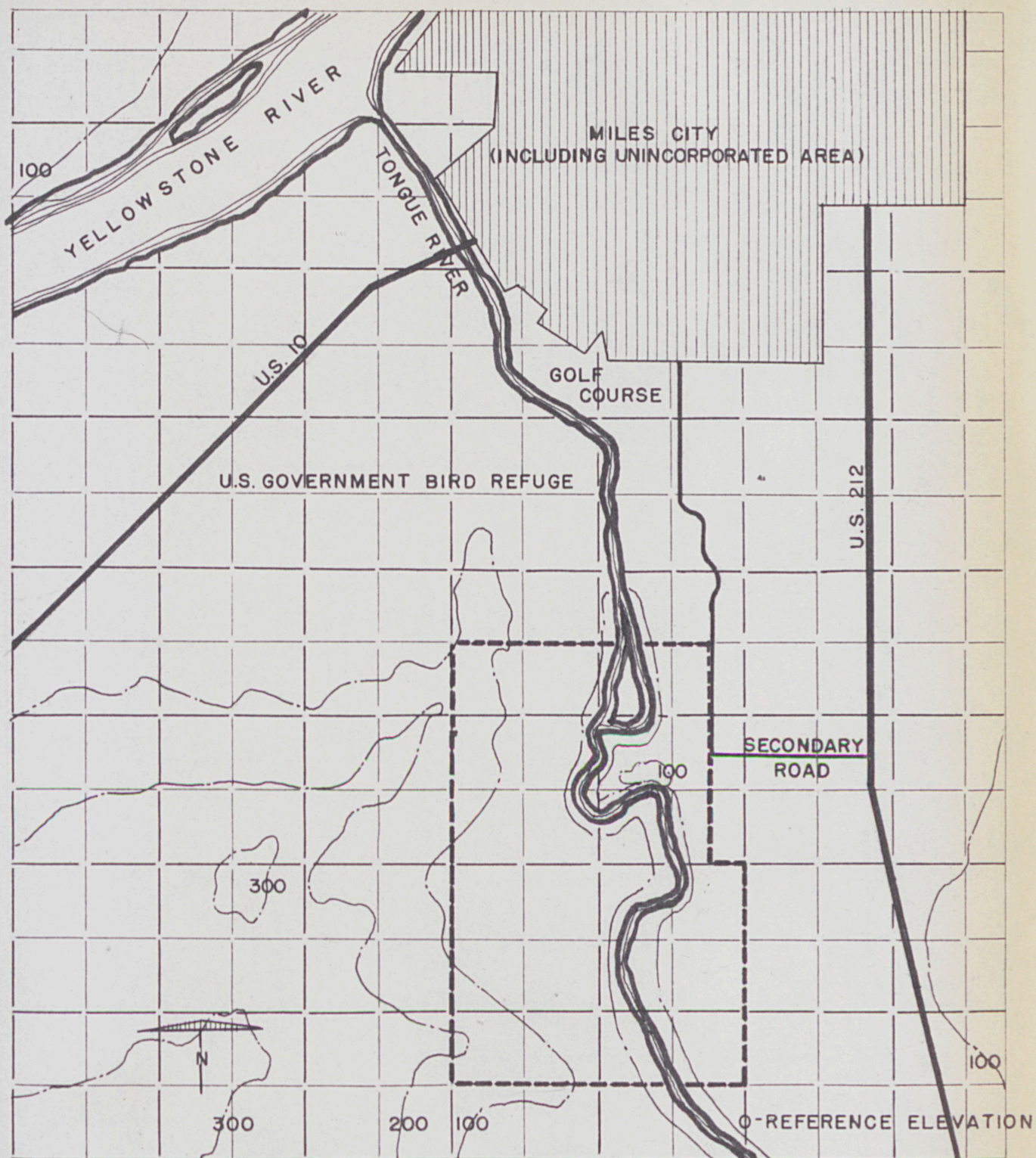
General

Since the founding of the Cistercian Order, certain traditional considerations have affected the selection of a site. Stephen Harding laid down three guides in his Charter of Charity in 1109 for selecting a site. The guides follow in basic form:

1. The site must be in a valley, not necessarily on the lowest land; in fact, a slight rise is usually desirable.
2. The site must border on a river with provision to irrigate some of the land.
3. The site must be somewhat isolated from sound as well as human beings for the observance of the contemplative life. (8 : 4)

The terrain of the site was never discussed in ancient writings; but, judging from sites of previous Trappist Monasteries, it has been somewhat assumed that the terrain be as rugged and bleak as possible. Also, a wooded area is desired on the site to serve as a contemplative place for the monks working in the fields.

The site near Miles City provides an almost perfect solution to the requirements. As seen on the Maps of Figs. 15 and 16, the site is located in the Tongue River valley south of Miles City, Montana. The Tongue River runs through the site,



SCALE 0 1 2 3 4 5 10 FEET $\times 10^3$

KEY

- QUARTER SECTION BOUNDARIES
- SECTION BOUNDARIES
- - - - - PROPOSED MONASTERY SITE

FIG. 15. MAP OF PROPOSED MONASTERY SITE

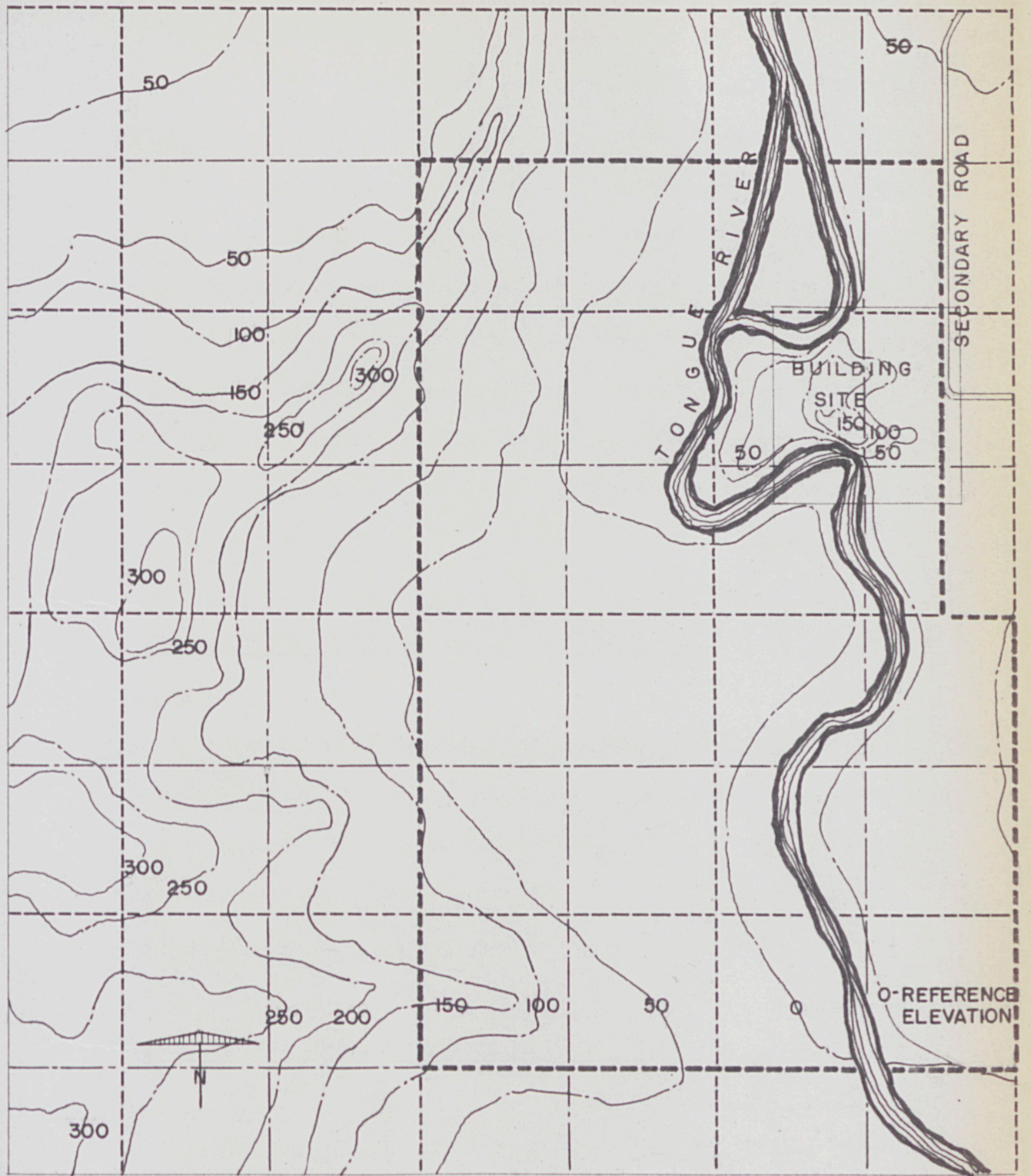
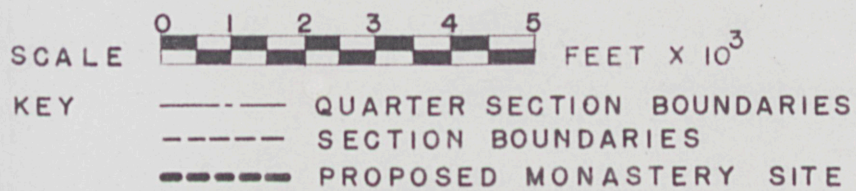


FIG. 16. MAP OF PROPOSED MONASTERY SITE

allowing for natural irrigation of over 60% of the land. The other 40% is suitable for dry-land farming and could be irrigated by the use of pumps. All water rights come with the site.

At present, there is not even a road into the site, although a rarely used dirt road borders the northeast corner of the land. The site is about three miles from Miles City, separated by the U. S. Government bird refuge. About one mile to the east is Highway 312 going south to Broadus. Highway 312 is hidden from view by a series of hills to the east of the site. Growth of Miles City in a southward direction is very unlikely. (See the Map of Fig. 14)

ADJACENT SURROUNDINGS

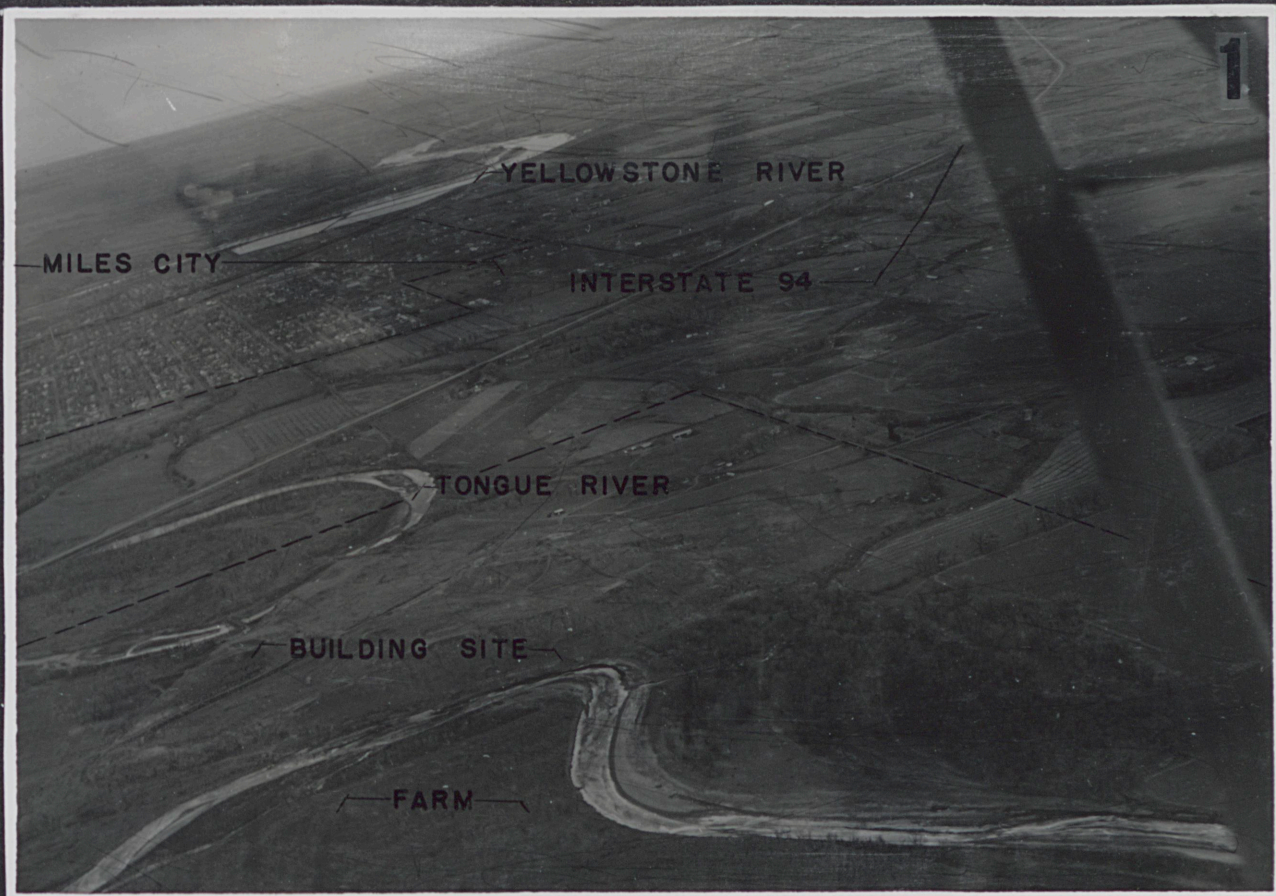
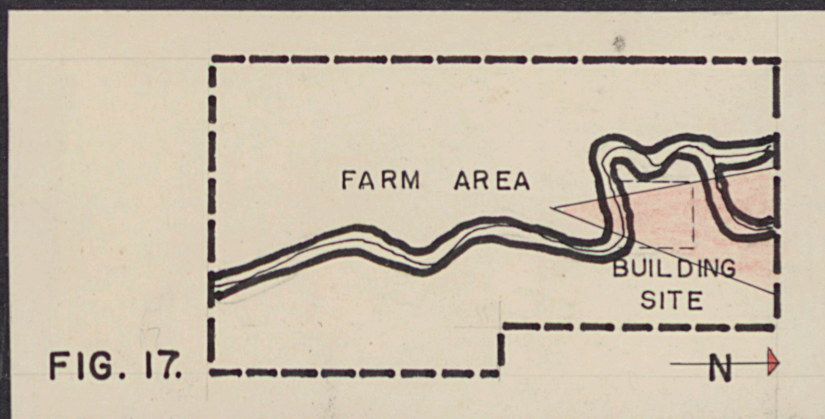
General

The surrounding views, as shown by the photographs in Figs. 17 to 23 fulfill the rugged and bleak requirement of the Trappists. To the north is the town of Miles City, completely hidden except for church steeples. To the south is the valley of the Tongue River. To the east and west are the wooded Pine Hills.

TOPOGRAPHY AND NATURAL VEGETATION

General

As the photographs of Figs. 24 to 27 and the Map of Fig. 28 show, the building site slopes very steeply to the south and east with lesser slopes to the north and west; this provides complete drainage in all directions. The Tongue River is at the



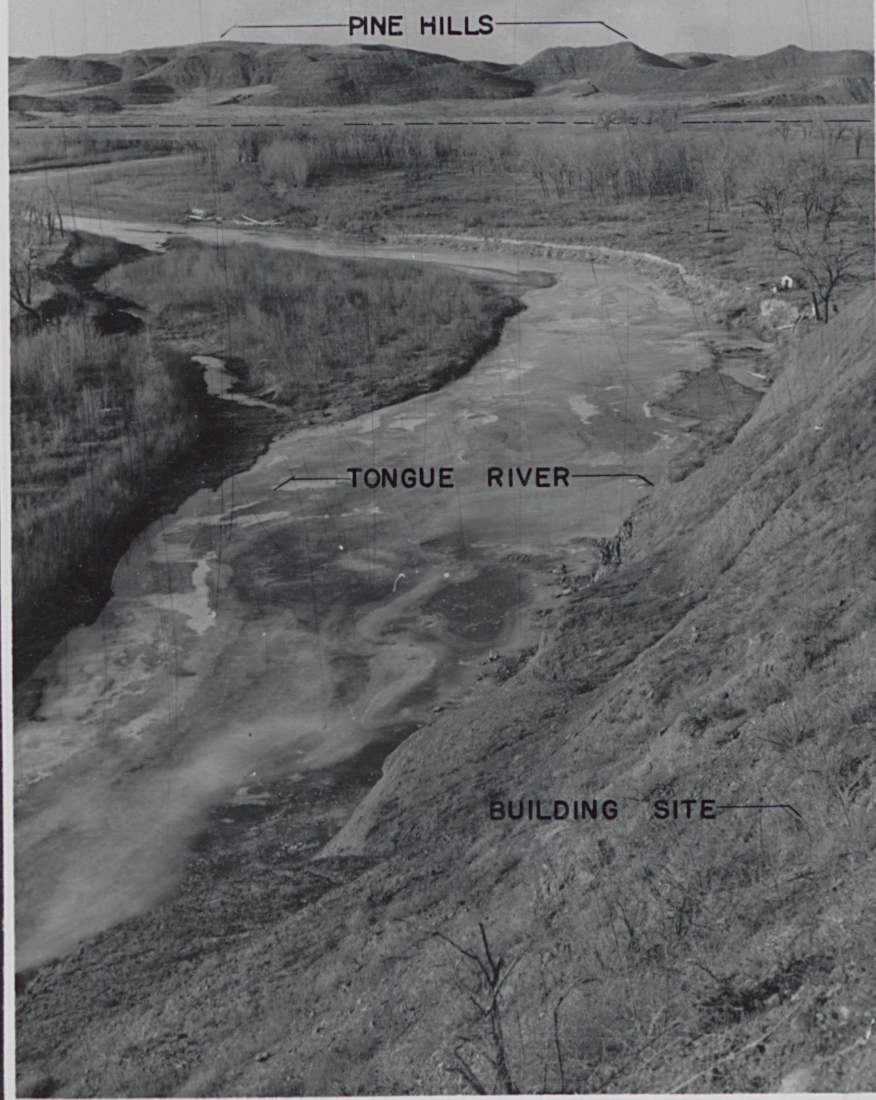
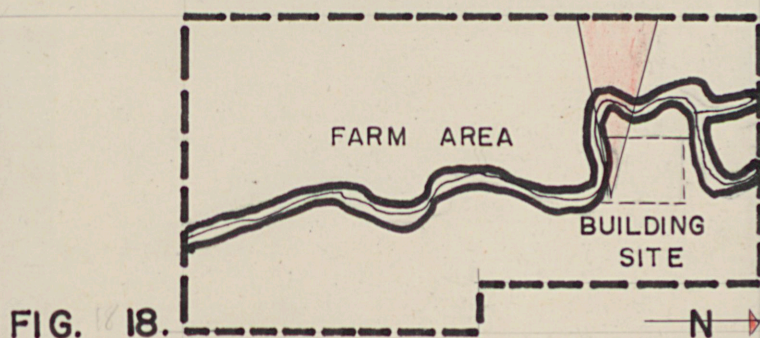


FIG. 18.

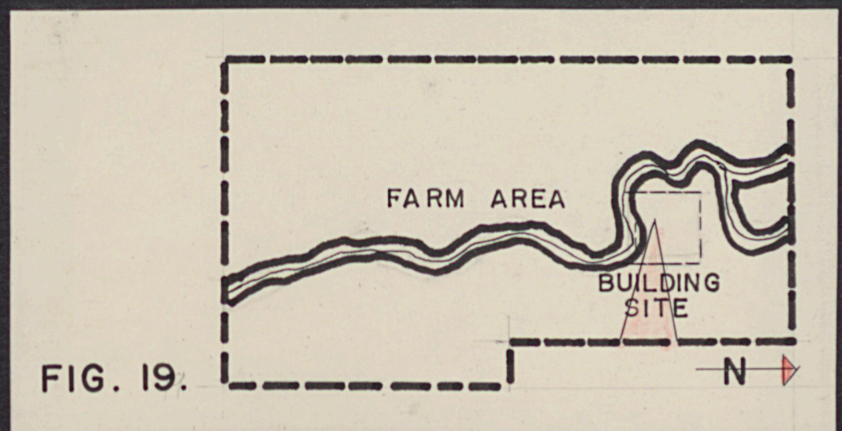
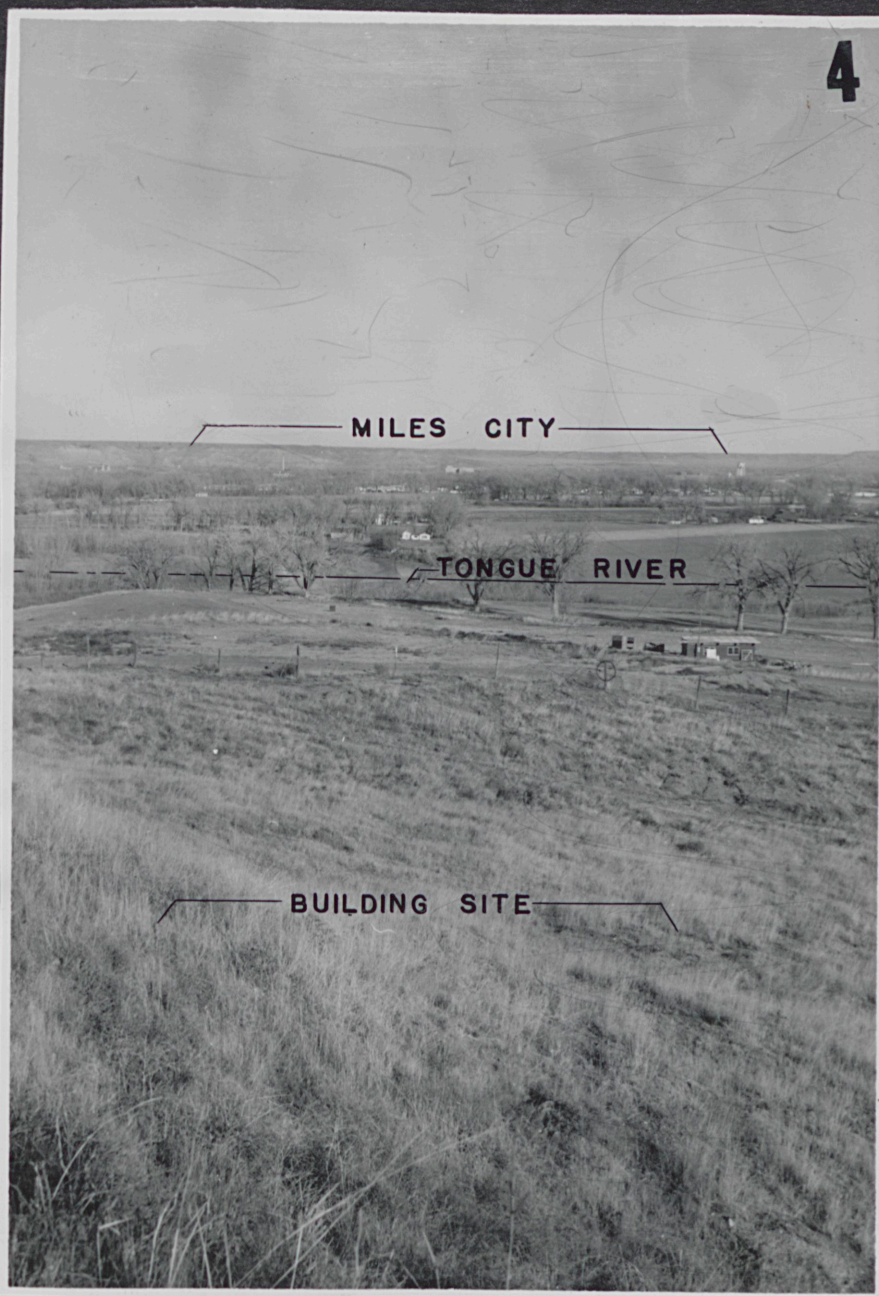
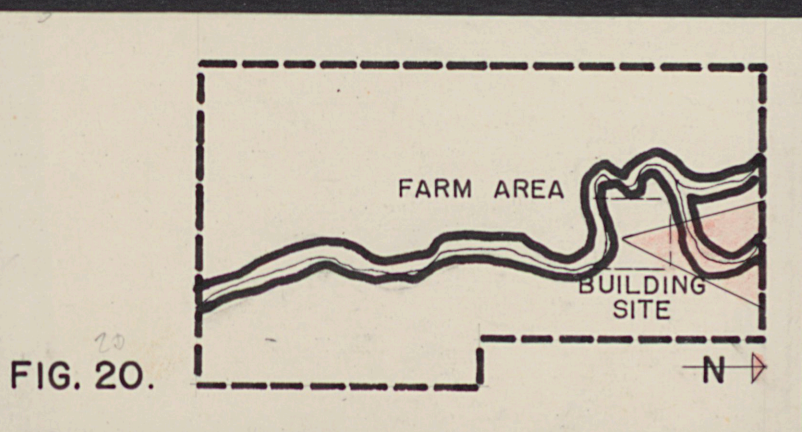


FIG. 19.



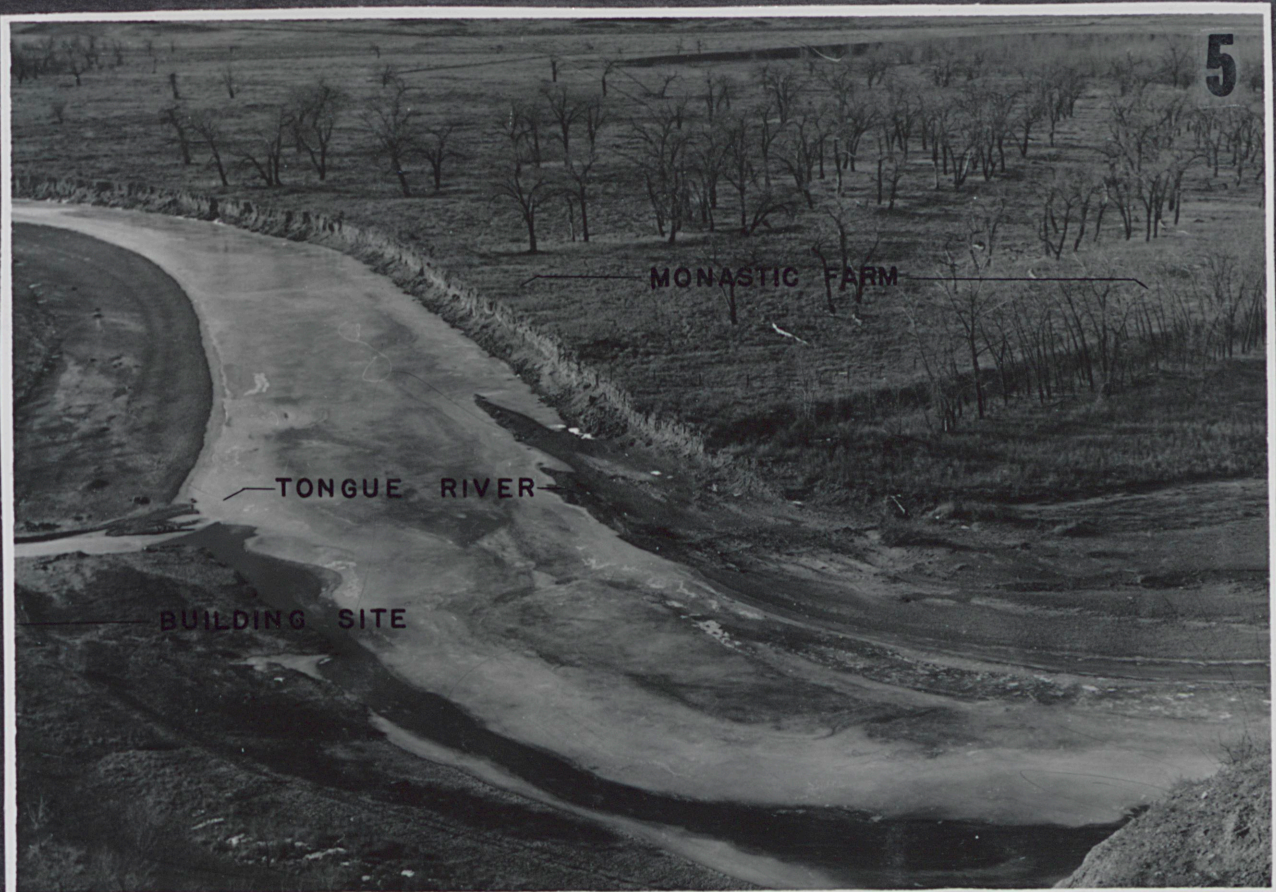
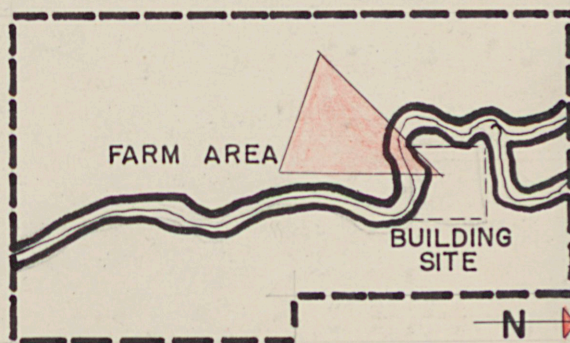
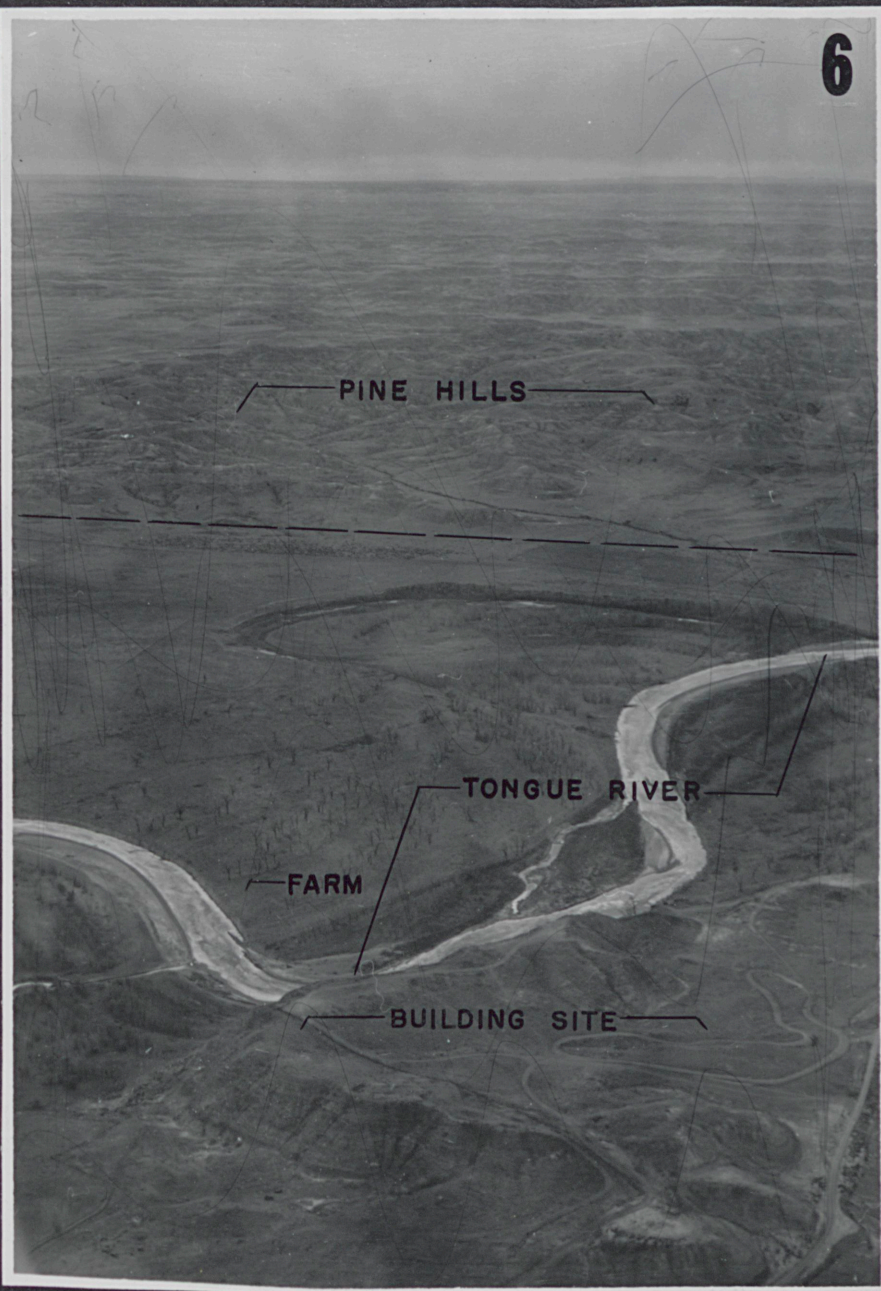
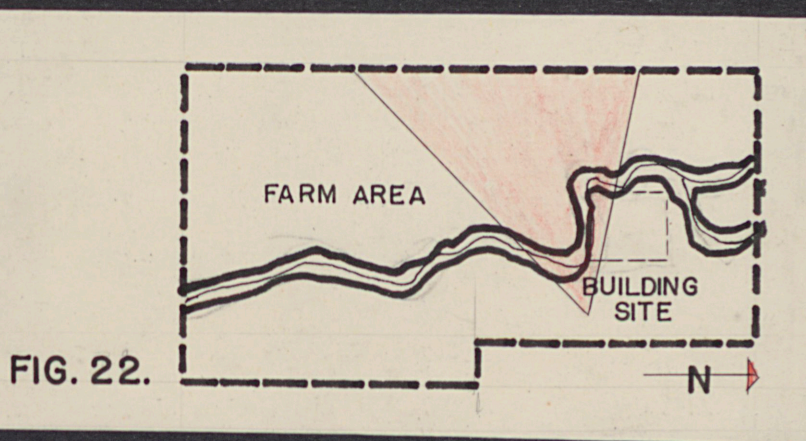


FIG. 21.





7 FIG. 23. MONASTIC FARM

PINE HILLS

TONGUE RIVER
FARM

BUILDING SITE

INTERSTATE 94

US 212

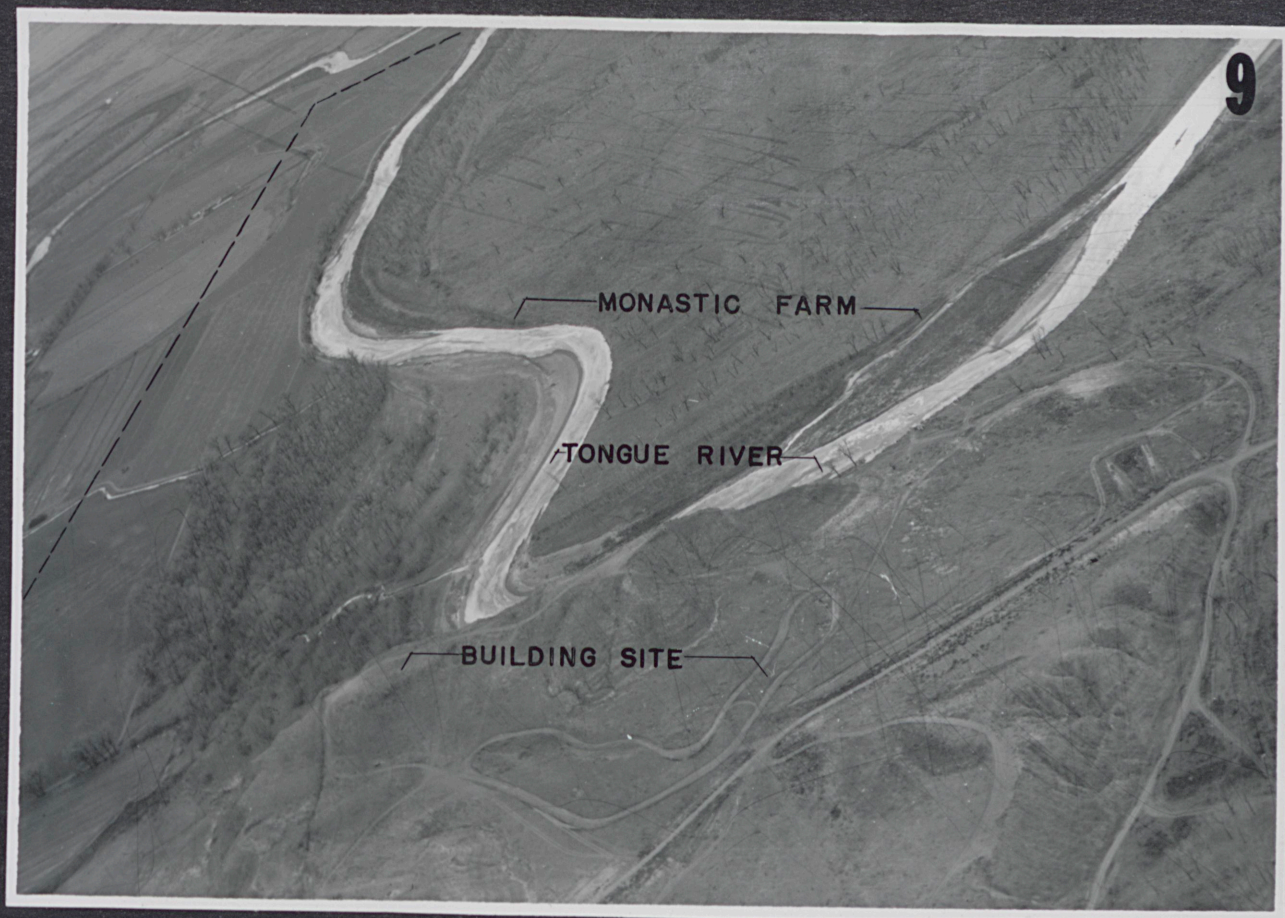
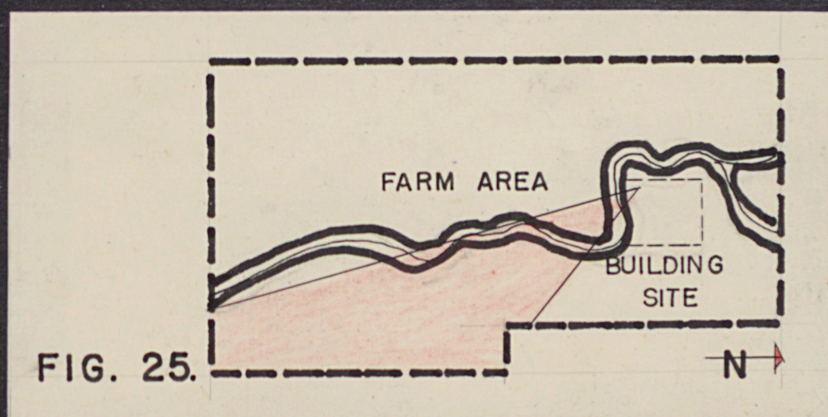
TO MONASTERY

GOLF COURSE

8 FIG. 24. MILES CITY

HIGH SCHOOL

MAIN STREET



YELLOWSTONE RIVER

10 FIG. 26. FT. KEOUGH

FT. KEOUGH

FISH HATCHERY

INTERSTATE 94

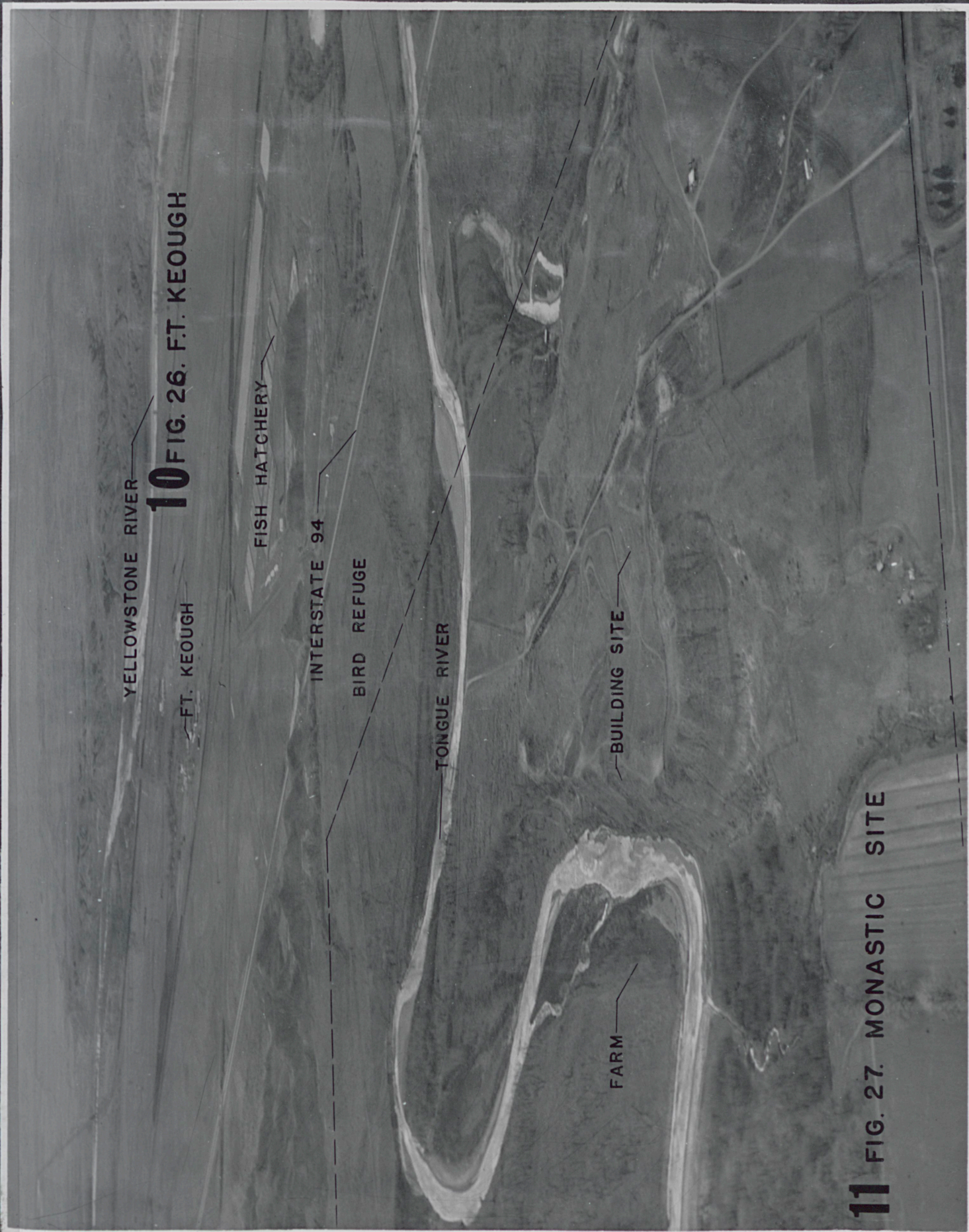
BIRD REFUGE

TONGUE RIVER

FARM

BUILDING SITE

11 FIG. 27. MONASTIC SITE



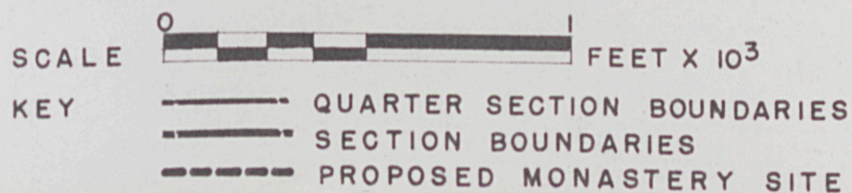


FIG. 28. MAP OF PROPOSED BUILDING SITE OF THE MONASTERY

bottom of the steep slope to the north and the lesser slope to the west. Trees are in the fields to the south and west; the actual building site being treeless but covered with grass. The trees are mainly cottonwoods and willows.

PROPOSED SITE SIZE

General

The site encompasses approximately 3,600 acres or approximately six sections. The actual boundaries are shown along the section designations in the Map of Fig. 16.

SOIL ANALYSIS

General

The top soil located on the site is classified as laurel soils in the brown soil group. Brown soils contain sufficient percentages of nitrogen and carbon to make them suitable for the growing of wheat, alfalfa, barley, and most any kind of vegetable if the needed water is available.

Soil Tests

Soil borings show that there is approximately two feet of top soil followed by 15 feet of brown clay and 9 feet of sandy-loam. The loam is on an 18 foot slab of gravel base which, in turn, rests on a shale formation of an unknown depth. Fig. 29 shows the soil core from recent drillings by the Standard Oil Company.

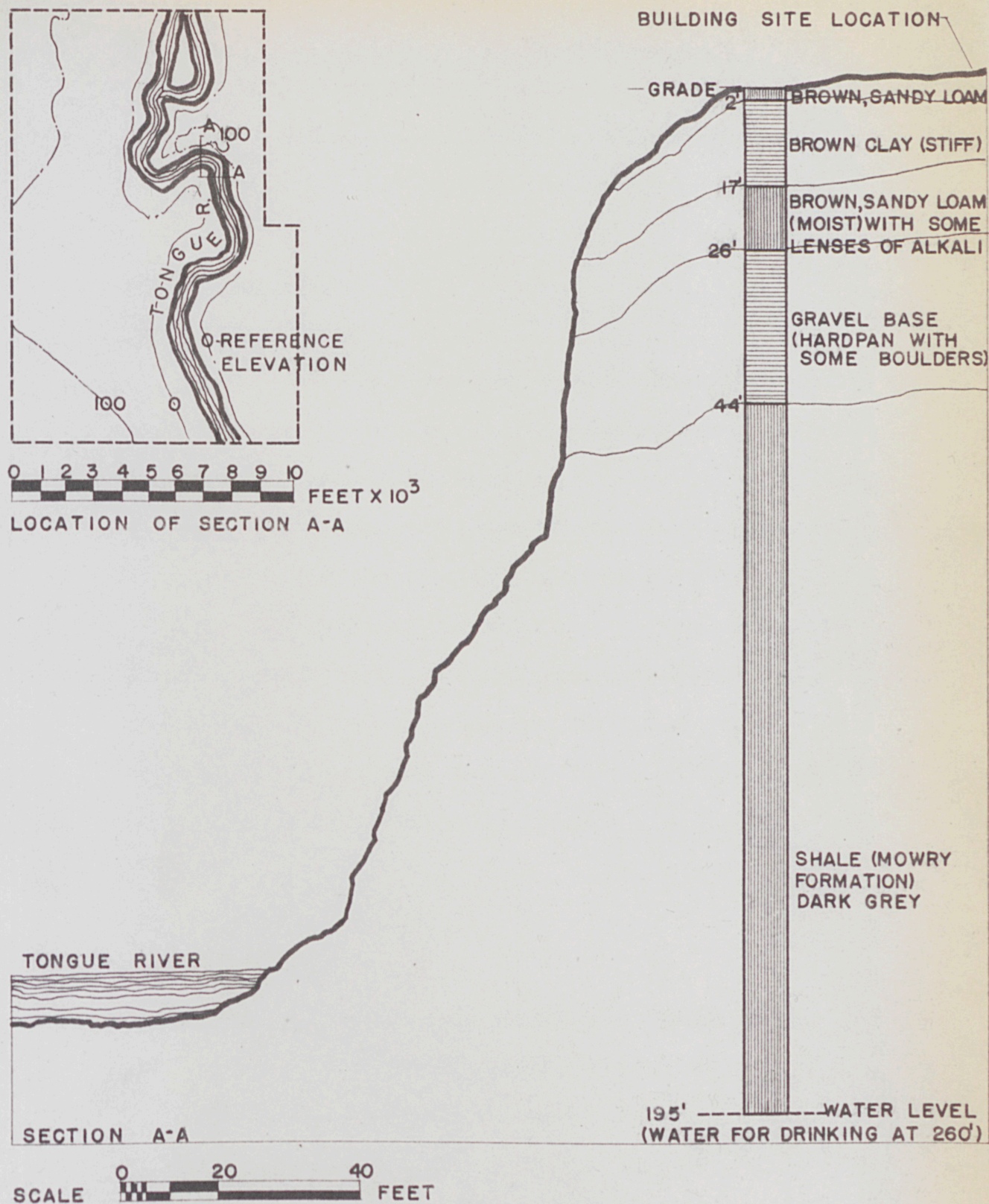


FIG. 29 SOIL CORE FROM BUILDING SITE
(28:)

Water Tables

The water tables for the farm land are about 3 feet in summer and 4 feet in winter. Water is about 260 feet below the building site, necessitating a well.

ZONING REGULATIONS

Trappist Regulations

Since the site is in a rural, unzoned area, no official zoning requirements must be met. Nevertheless, Gethsemani Abbey states as directives to new monasteries that: (1) the building must be made of "permanent" materials and construction practices; and (2) the entire monastery must be absolutely fireproof.

Since the traditional monastic plan has the food storage for the monastery in the cellar of the monastic buildings, a firewall must be constructed between the storage and the rest of the building. All farm shops and storage buildings need not be fireproof although this is desirable.

PARKING, GUESTS, AND ROADS

Parking and Guests

A Trappist monastery in all instances accepts guests, but, only during hours of work are guests allowed inside the monastery. Females are never allowed in the monastery.

As to parking space, the Miles City monastery can be expected to have only one-half the automobiles that Gethsemani Abbey

does. The reasons for this are: (1) Montana has a relatively small population, especially in the Miles City area; and (2) the Montanan institution would neither be as old nor as famous as Gethsemani. Since Gethsemani allows space for ten cars, space for five cars will be ample for the Miles City monastery. (27 : 2)

Roads

The roads into the monastery would be of compacted earth or gravel. This discourages partially-interested guests and is in keeping with the Order's views of poverty.

AVAILABILITY OF UTILITIES

General

The site has available electricity but no sewer, gas, or water. Nevertheless, gas can be piped to the site from the main line about 2,000 feet away. (See Fig. 30) Telephone services are not needed in the monastery.

FUTURE EXPANSION

General

Since the Trappists limit the monastery size to around 100 monks, future expansion will probably never be necessary because the monastery will be initially planned for the 100 monks.

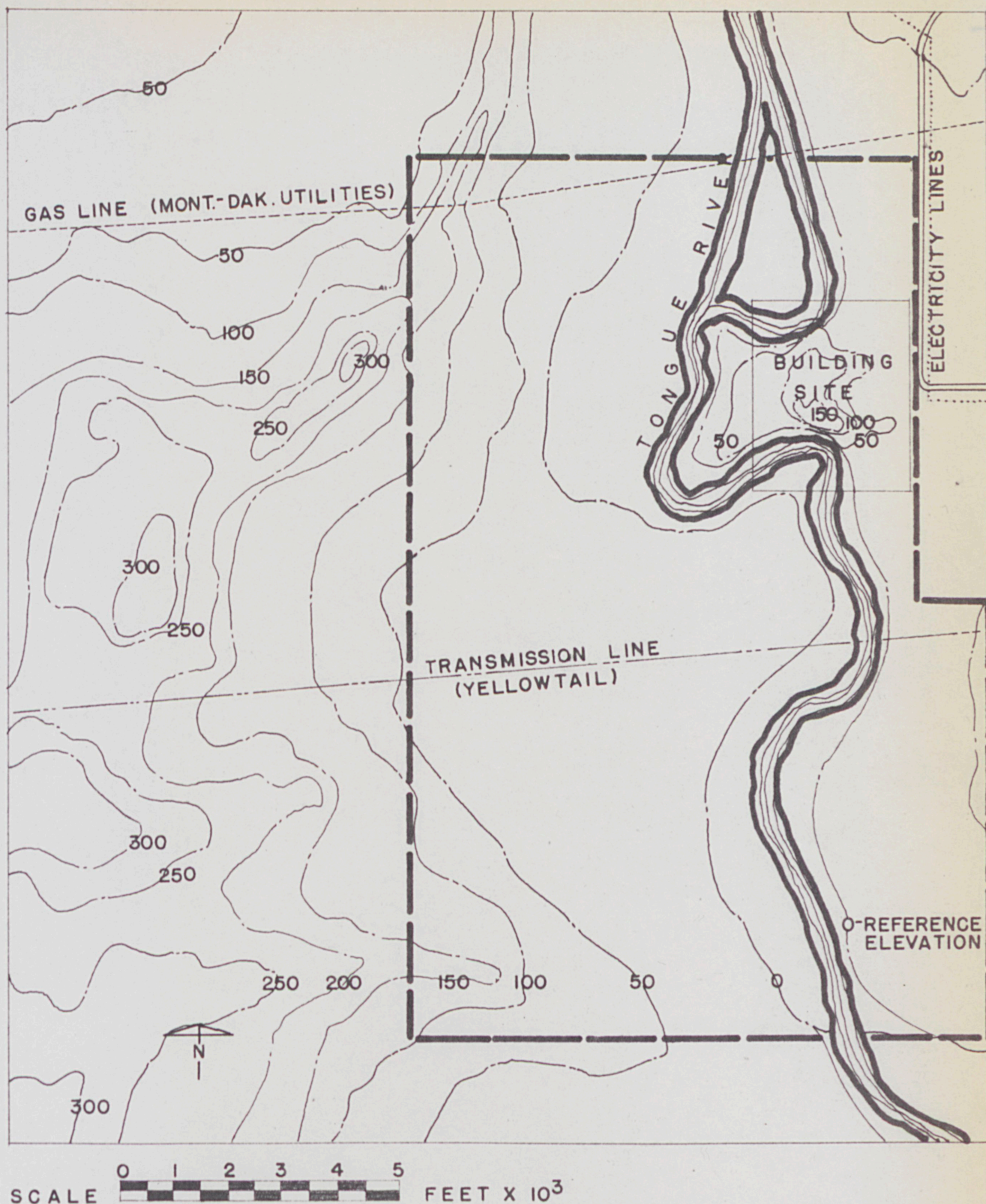


FIG.30. MAP OF UTILITIES OF THE PROPOSED SITE

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