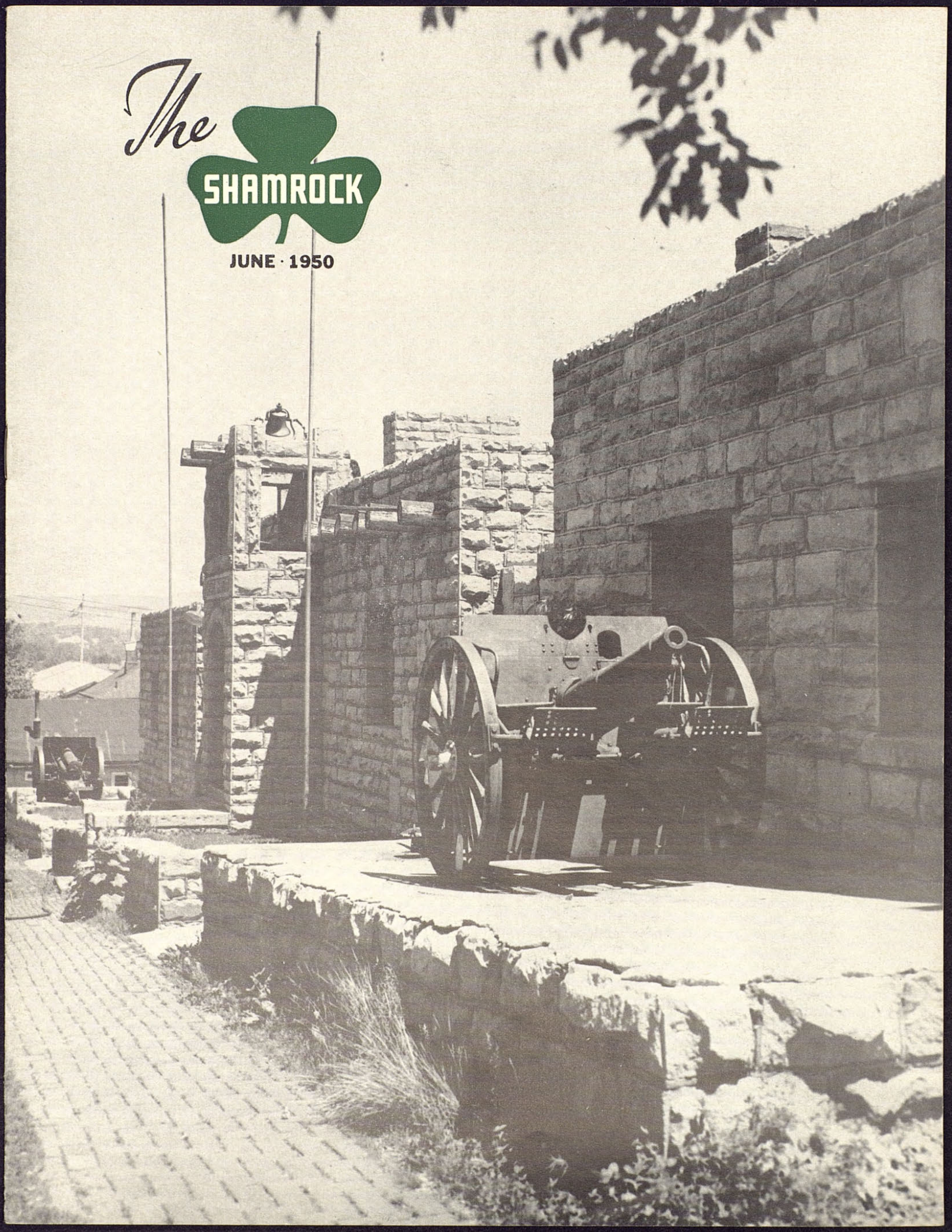
The SHAMROCK

JUNE · 1950



Fisher's Peak, majestic flat-topped mountain near Trinidad, Colorado.

TRINIDAD---*Southern Gateway to Colorado*

Strategically located on the Santa Fe Trail a few miles from Raton Pass, Trinidad, Colorado, has long played an important part in the history and development of the Southwest. Nearly a century ago, this historic city became a haven for pioneer travelers who stopped to mend harness and wagons, to re-plenish their supplies, and to obtain information about the trail beyond before attempting to thread their way through the rugged mountains to the west.

Lying among the steep hills along the Purgatoire River, at the foot of an imposing flat-top mountain, Trinidad is a picturesque city in a fascinating setting. The flat-top mountains nearby, the grotesque rocks in an adjoining valley, and the snow-capped peaks in the distance bear names suggestive of the romantic legends of the past. Probably the most famous landmark in the vicinity of Trinidad is Fisher's Peak, named for an early explorer who climbed to its 9,700 foot summit. Another historic landmark is Stonewall Gap, a few miles to the west of the city. Located in the high, stone wall at the head of Stonewall Valley, this unique formation provides a natural gate leading into the beautiful Monument Lake region. A little farther away, but still within sight and easy driving distance of the city ,are the famous and awe-inspiring twin mountains — the Spanish Peaks. These two mountains were called "the Breasts of the World" by the Indians who once inhabited the region.

The first English-speaking settlers into the region were probably traders, merchants, blacksmiths and wagon menders who, because of the strategic location at the foot of Raton Pass, established business enterprises in the vicinity of what is now Trinidad to serve the gold-seeking caravans headed for the promised land of California. Almost simultaneously, a few adventurous ranchers began headquartering in the area. True, the activities of these first settlers were incidental to the then more im-

portant business of finding gold. Today, however, the gold rush is a finished page in the history of America while the trade, commerce and agriculture initiated by these early settlers has survived and multiplied many times.

Historically, the most important impact of the California gold rush was, of course, the fact that it began the development of the West. Today, because of this development, millions of people all over the world depend upon the wealth of the West for a part of the food they eat, the clothing they wear, and the gold, silver, coal, oil, gas and other minerals so important to living in this modern machine age. This miraculous western development is particularly evident in the growth and development of the city of Trinidad.

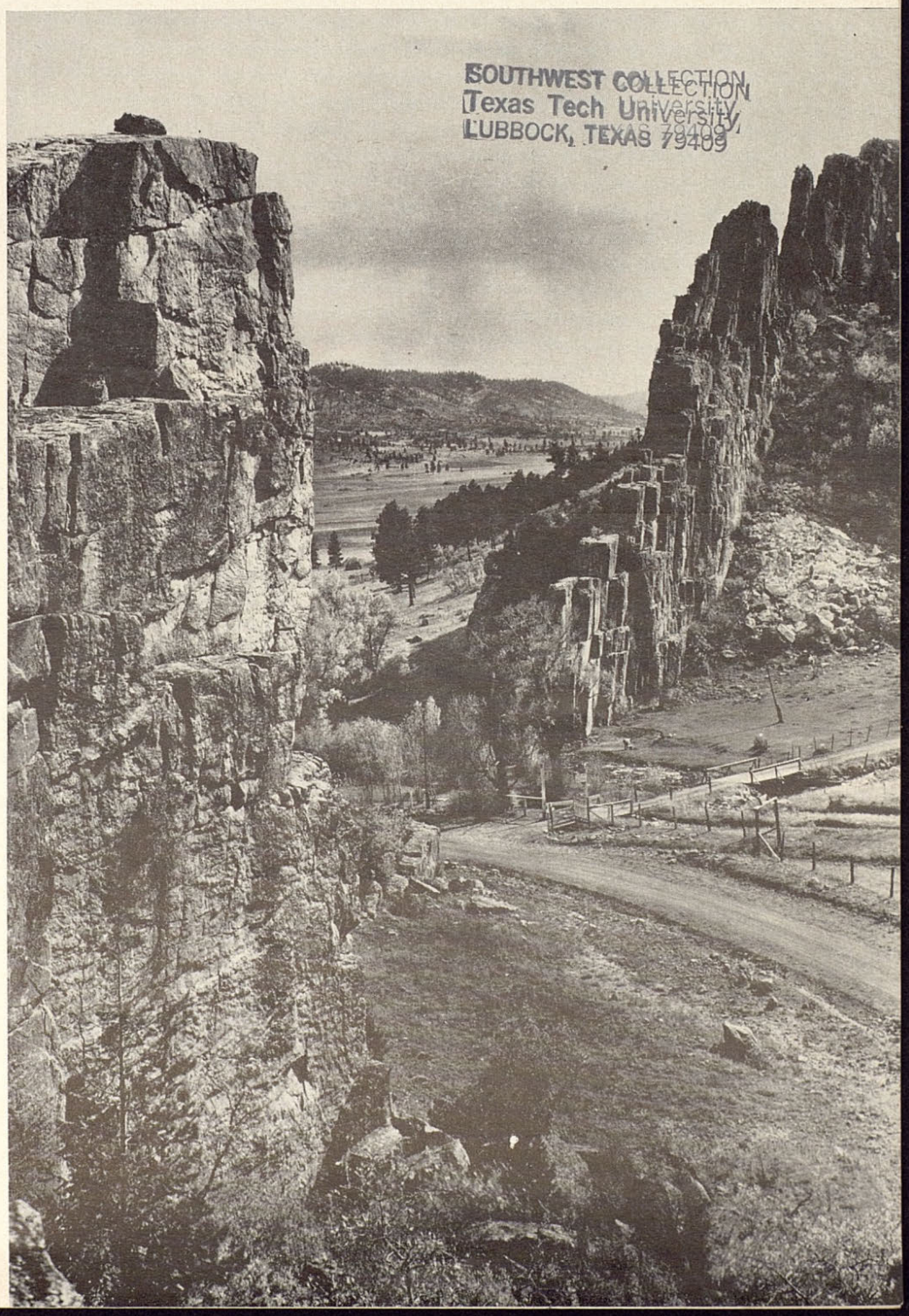
As in the development of most towns and cities in the west, transportation has been of fundamental importance to the development of Trinidad. Throughout the economic history of the West, transportation has served as one part of an endless and healthy cycle. That is, industrial development promotes better transportation which in turn promotes more industrial development to provide the impetus for still better transportation and so on indefinitely as long as men are free to take advantage of their opportunities. The growth of Trinidad is an example of this inter - relationship between economic development and transportation.

The original force which started this chain reaction of economic development and transportation, in which Trinidad played a part, was the discovery of gold throughout the west. As fast as the news of the gold discoveries spread, established wagon trails began to cut across the continent. With the appearance of these transportation routes, towns, villages, and military forts were established along the trails to provide services of all kinds for the travelers. Trinidad was one of the settlements created along the Santa Fe Trail. Cattlemen began driving their herds into the newly explored regions. This influx of agricultural and commercial enterprises throughout the West resulted in the need for still more trails.

In 1867, the Stage Line from Denver to Santa Fe by way of Trinidad was established, bringing still more people and more industry into the area. By 1875 commercial and ranching activities had increased to such an extent that the Santa Fe Railroad was extended from La Junta to Trinidad. With the coming of the railroad, Trinidad became an important industrial center. By 1880 Las Animas County, with Trinidad as the County Seat, had become the leading coal producing area in Colorado, producing about 1,000,000 tons of coal per year.

Since the establishment of the railroad, Trinidad and its surrounding region has grown steadily both in population and in economic activity. Keeping pace with this growth, greatly increased transportation facilities maintain the city's importance in the commercial activities of the Southwest. Three modern paved highways—

Stonewall Gap forms a natural gateway through a unique rock formation which can be traced from Canada to Mexico.



Beef production is the leading agricultural activity in Las Animas County. About 90 per cent of all farmers and ranchers in the county are engaged in the production of range beef.

Scientific methods have increased productivity of many Las Animas County ranches. John and Ernest Myers, with County Agent Verne Stewart (center), look over a field of irrigated pasture on their ranch near Trinidad.

U. S. Highways 350, 85, and 87—pass through Trinidad, accommodating the heavy traffic of trucks, buses, and passenger vehicles entering and leaving the city each day. Latest addition to the transportation facilities serving the area is the improvement of airport facilities and the construction of a modern, well-equipped airport terminal building. Less than a century ago, the journey to nearby Denver was a major undertaking. Today, the Trinidad resident can board a scheduled airline plane at Trinidad in the morning and arrive in New York, San Francisco, or Mexico City that evening.

The economic activities of the present city of Trinidad and its surrounding area include coal production, farming and ranching, and a brisk tourist trade. While the area has long been a prolific coal producing region and still produces large quantities of this fuel, its position as a farming and ranching center is becoming increasingly important. Trinidad and vicinity is also gaining greater popularity each year as a vacation center.

The principal agricultural activ-

ity in the county is range beef production. This activity contributes more than two-thirds of the total agricultural income of the county annually. More than 90 per cent of all the farmers and ranchers in the county are engaged in beef cattle production. Many of these depend upon beef production for their entire income while others also engage in some farming activities. With 4,080 square miles within its extensive boundaries (barely three square miles less than the state of Connecticut), Las Animas County is the largest County in Colorado and ranks first in the production of range beef. Total beef production in the county is valued at more than $10,000,000 annually.

In addition to the production of beef, about 36,000 acres of land in the county are devoted to the production of irrigated crops and about 75,000 acres are planted to dry land crops. Principal crops include alfalfa for hay and seed, small grains, sorghums, beans and sugar beets.

Trinidad's steadily growing tourist trade is becoming increasingly important in the community's economic activity. Strategically located near the southern border of the state, Trinidad has long been a convenient gateway to all parts of scenic Colorado. Many Colorado visitors find it an excellent headquarters for their vacations because of the variety of scenic drives leading out from the city in all directions. Each year, many vacationing fishermen visit beautiful Monument Lake, a short 38-mile drive from Trinidad through Stonewall Valley.

Not only are Trinidad residents proud of the community's past and present achievements, they are also confident that its future is bright with promise. Evidence of this confidence in the future is apparent in the many civic improvements throughout the city. A new municipal power plant has been recently completed. This plant is designed to serve the needs of Trinidad residents and industrial users for many years to come. The previously mentioned airport improvements were also completed within the past few months. A greatly enlarged and improved public school system has been approved and is now in the planning stage.

Trinidad's up-to-date junior college is still another fine example of civic growth. This institution was organized in 1926 as an aid to the youth of the community in preparing themselves for constructive participation in a democratic society. Thoughout its history the school has done a commendable job of preparing students for good citizenship. It is now better equipped than ever to serve the community with its recently enlarged facilities for training in technical and manual skills. One phase of its technical training program which has received national recognition is the gunsmith school.

Residents of Trinidad today can look back with pride on the city's historic role in the development of the Southwest. They may justifiably be proud of the present health and prosperity of the community. And they may well be optimistic about the future of their city and its surrounding area. Trinidad is truly a city with a rich background of tradition, a present development marked by growth and progress, and a future bright with promise.

Kit Carson Park, with Simpson's Rest in the background, is a symbol of the pride Trinidad citizens have for the traditions of their community.

This new Airport Terminal is evidence that Trinidad citizens are as hopeful for the future of their city as they are proud of its past.

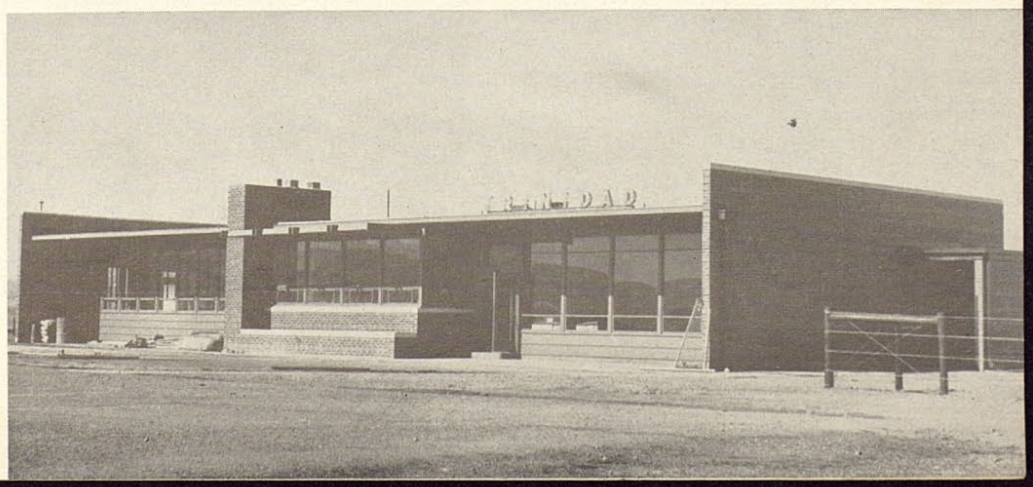
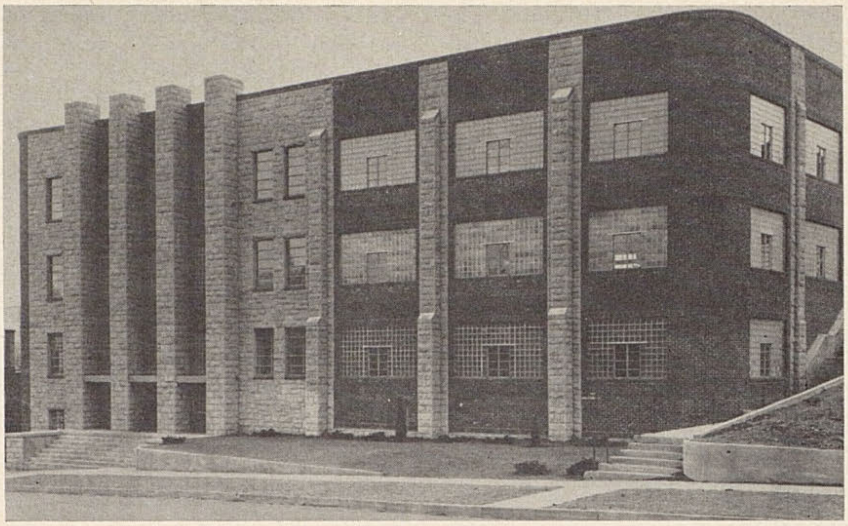


PHOTO CREDITS — Photographs of Trinidad and Las Animas County scenes were used through the courtesy of John M. O'Connor, Trinidad Chamber of Commerce; Verne Stewart, County Agent; and the Trinidad State Junior College.

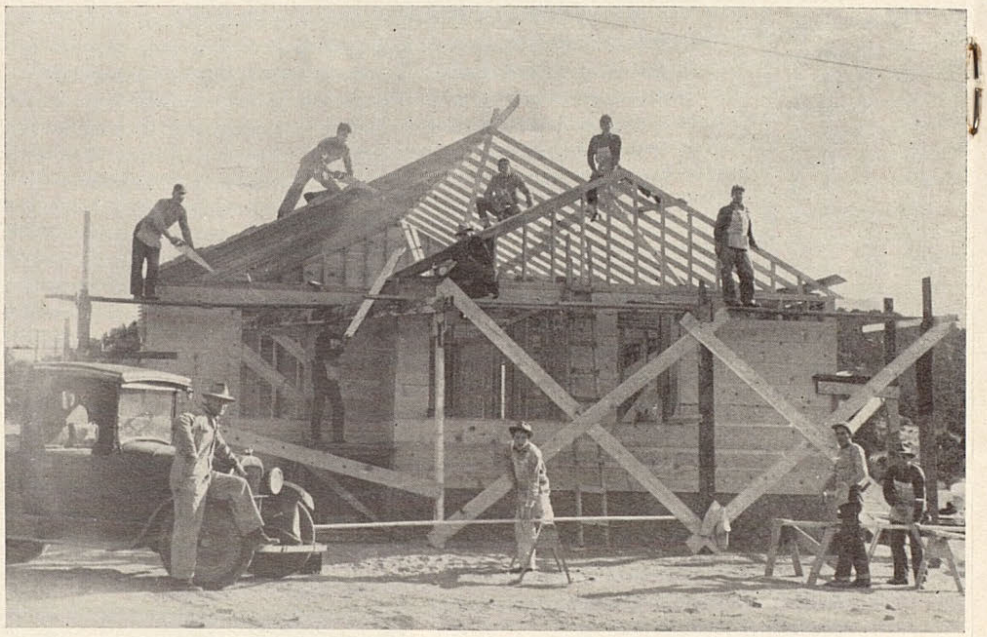
Education Wit

Trinidad State Junior
and vocational activiti



Latest major addition to Trinidad Junior College is the James E. Mullen Mechanic Arts Building (left) which houses modern facilities for many vocational and adult education classes.

Vocational education often consists of acutal on-the-job training under the supervision of skilled craftsmen. A Building Trades class is pictured at right constructing a modern dwelling.



Students at Trinidad Junior College training for the teaching profession study modern methods of education under experienced teachers.

'ith a Purpose

ior College directs academic vities toward community needs

This year Trinidad State Junior College at Trinidad, Colorado, begins its second quarter century of service to the community.

Established in April, 1925, the college at first offered one year of regular study on the college level. Most of these first courses consisted of academic subjects applicable to requirements for various Arts and Science degrees.

Since its founding, the Trinidad Junior College has greatly broadened the scope of its activities. In addition to the regular academic program, a large number of vocational and technical courses have been added in order to increase the school's usefulness to the youth of the community. Many of the facilities of the college have also been made available for evening adult education classes.

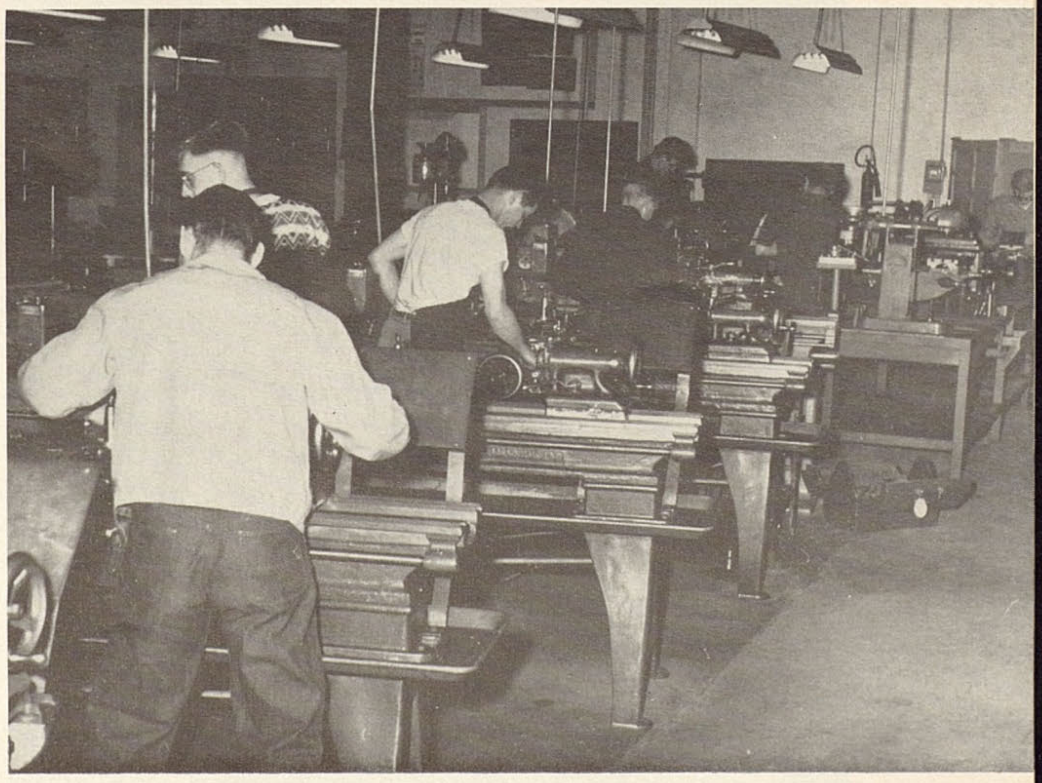
The latest addition to the school's facilities for vocational training is the James E. Mullen Mechanic Arts Building. This building houses classrooms and shops for such courses as Gunsmithing, Building Trades, Hand Crafts, Auto Mechanics and other vocational courses. The Mechanic Arts Building also houses Homemaking and Engineering Departments.

As part of its program for greater community service the college also offers a number of terminal courses. These courses are not necessarily planned to lead to more advanced degrees but are designed to develop in students sufficient skill at the end of the two-year course to enable them to find suitable employment. Terminal courses include instruction in Business, Distributive education, and most vocation subjects.

Today, with a well-trained faculty, modern equipment, and the backing and cooperation of the community as a whole, Trinidad State Junior College provides its students with modern education at its best.

Evening adult education classes provide the opportunity for Trinidad citizens to learn a variety of useful trades and interesting hobbies.

The Gunsmithing Department, providing training in a useful and highly skilled craft, attracts students from all parts of the United States.



Octane Numbers and What They Mean

While there probably isn't a motorist in the country who hasn't heard the phrase "octane number," chances are that only one in a thousand drivers who patronize your service station knows just what octane numbers really are, how they are arrived at, an exactly what significance they carry.

Those in the petroleum industry know that octane numbers provide a quick and convenient index to to the antiknock quality of a motor fuel. But the layman often finds octane numbers hard to understand. Part of his confusion, no doubt, results from the fact that there is more than one recognized method of determining fuel antiknock quality. Even those who know this may become perplexed when the laboratory methods record different octane values for the same gasoline. Beyond that, road research—the final method of determining fuel performance in a vehicle—may show the gasoline to have still a different antiknock quality.

Of the several laboratory methods of determining the antiknock quality, or octane number of motor fuels, the two most often used are the Research method and the Motor method. The Motor method was adopted by the Cooperative Fuel Research Committee in 1932, and the improved Research method came into use seven years later. Both are now official methods of the American Society for Testing Materials. The standard variable compression single cylinder CFR knock testing engine is employed in both instances, but the essential operating conditions vary.

The yardstick for establishing the octane number of any fuel is the "octane scale," which was invented more than 20 years ago by Dr. Graham Edgar, then director of research for Ethyl Corporation and now a vice president of that company. In creating his scale, Dr. Edgar selected two pure chemicals as primary reference fuels. One was iso-octane, a derivative of petroleum, which has higher antiknock value than any present-day commercial motor fuel. The other was normal heptane, which originally came from the Jeffrey pine tree of the West, but which now is synthesized from petroleum.

For knock-rating purposes, iso-octane carries an octane number of 100, while the normal heptane is assigned a zero octane value. Various mixtures of iso-octane and normal heptane are used as reference fuels in the test engine until a mixture is found which will produce the same knock intensity in the engine as did the gasoline sample whose antiknock quality is being established. The percentage of iso-octane in the matching mixture is designated as the octane number of gasoline. For example, if a mixture of 80% iso-octane and 20% normal heptane were required to exactly duplicate the knock intensity of the gasoline being rated, the gasoline would be valued at 80 octane number. If the mixture were 86% iso-octane and 14% normal heptane, the gasoline would be rated at 86 octane, and so on.

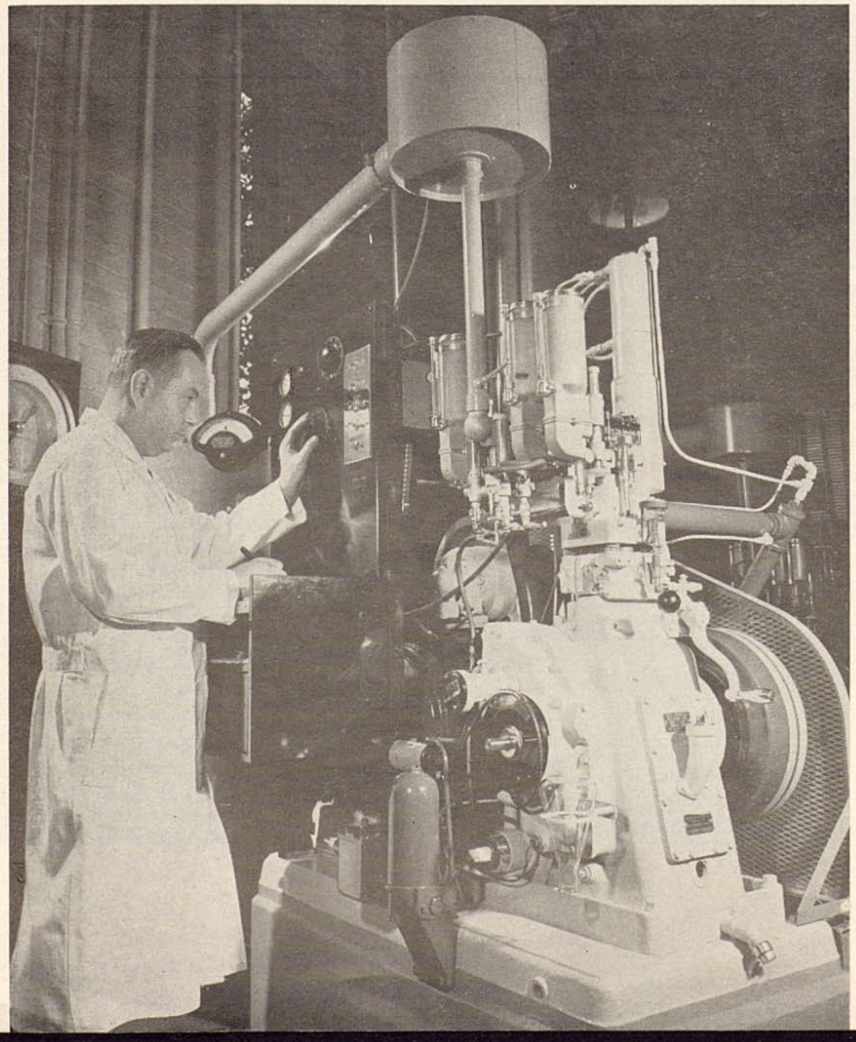
While the test is conducted in the same engine and by practically the same procedure under either the Research or Motor method, the essential engine operating conditions vary as follows:

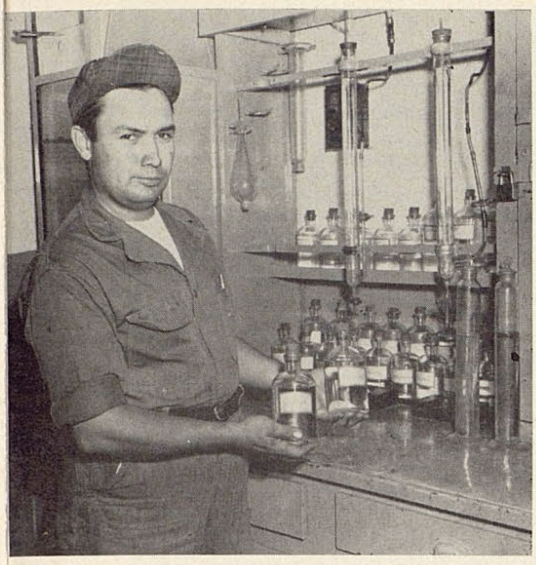
	Research	Motor
Speed (rpm)	600	900
Coolant temp. (degrees F.)	212	212
Mixture temp. (deg. F.)		300
Intake air temp (deg. F.)	125	75
Spark advance (deg. BTC)	13	26*

*At 5:1 compression ratio and is automatically varied for other compression ratios.

It is because of these differences in basic operating conditions that the octane value of fuels tested by the less severe Research method sometimes is as much as 15 octane numbers higher than those de-

When a sample of gasoline is used as fuel in this single cylinder test engine, it can be made to knock, and the intensity of the knock recorded by a "knock meter." By comparing the knock intensity of the sample fuel with that of reference fuels of known octane number, the octane rating of the sample may be determined.





This apparatus is used in preparing reference fuels for the test engine. By mixing normal heptane (zero octane) with iso-octane (100 octane), in varying proportions, reference fuels of any desired octane number between zero and 100 may be obtained.

termined by the Motor method. For this reason, it is necessary in discussing the octane rating of any given fuel to know what method was utilized.

Much is heard of fuel "jump." "Jump" (or sensitivity as the petroleum technologist calles it) is merely the Research rating minus the Motor method rating. For example, a typical refinery stock fuel produced by polymerization might rate 95 octane number Research and only 80 Motor. The sensitivity would be 15—a "high jump" fuel to the trade. Fuels showing little spread between their Research and Motor ratings are termed "low jump" gasolines. Often the actual difference in the octane rating of a fuel by the two methods is designated by such terms as "6-jump," or "8-jump," or whatever the case may be.

Usually, for gasolines of equal Motor octane number, those having high sensitivity give better road performance than those of low "jump." However, sensitivity alone is no guarantee of satisfactory road antiknock performance at all engine speeds. The only way a refiner can be certain of producing a fuel of the highest road performance from his available base stocks is to determine the desired fuel composition through a series of actual road tests, employing several representative automobiles under different test conditions. Most petroleum technologists and automotive engineers agree that while the Research and Motor laboratory methods are of distinct value, they are not the true measure of the road antiknock performance of all fuels in all cars.

Among the foremost exponents of road research is Ethyl Corporation, which operates a major road testing laboratory in San Bernardino, Calif., and which also conducts considerable road work at its central research laboratories in Detroit, Mich.

The table below, prepared by the Refinery Technology Section of the Ethyl Corporation Research Laboratories, illustrates the results obtained in one car. This table clearly shows how the laboratory octane numbers differ from one another and how road tests produced an even third set of octane values for several special fuels subjected to this study:

	LABORATORY OCTANE NUMBER		Road Rating Critical Speed
Type of Gasoline	Research	Motor	
Straightrun type	90	90	88
Highly cracked gasoline	95	82½	88
Blend of saturated and cracked	90	85	88
Catalytically cracked	99	85	100+
Special blend (olefinic light ends, saturated heavy ends)	88	79	88

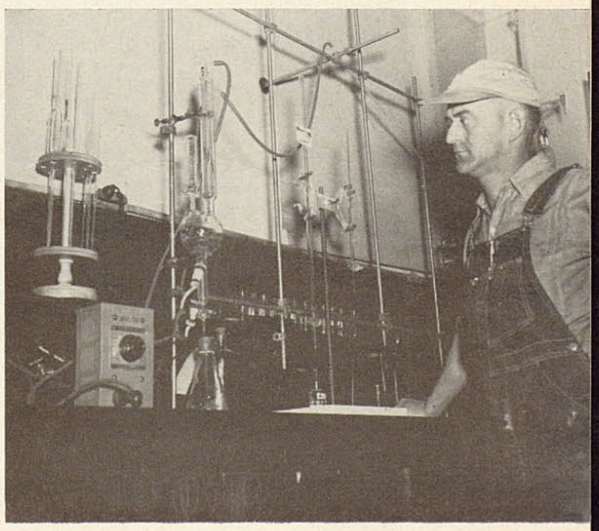
At present, there are two widely recognized methods of testing for road octane number—the Uniontown and the Borderline method.

Under the Uniontown method, the vehicle is adjusted to the manufacturer's specifications and then warmed up on the road. At the end of the warm-up period, the fuel system is connected to a supply of the gasoline which is to be tested. The car is slowed to 10 mph and then accelerated on a level road in high gear at wide-open throttle. During the acceleration, road test engineers record the knock intensity observed (usually by ear) at various speeds. This process is repeated with various blends of reference fuels until a blend is found which gives the same maximumu knock intensity as the fuel sample. The known octane number of the reference fuel then is assigned to the fuel sample under test.

When the Borderline method is used, the automatic spark advance mechanism of the distributor is disconnected, and the ignition timing is controlled and measured from the road test engineer's seat by means of an electronic device. This apparatus also indicates engine speed, spark advance, temperature, and other important operating conditions. With the gasoline to be tested, acceleration tests are run with various degrees of spark advance, and the engine speed is noted in each case when the knock "dies out." These data, together with the standard spark advance curve of the engine, can be plotted graphically. Similar tests usually are made with a number of reference fuels of different known octane numbers, and the speed and spark advance data also plotted. In this way, the engineers can determine the equivalent road octane number of a gasoline at any given engine speed.

Road tests are essential to indicate how different gasolines will perform in actual service. The Research and Motor methods are necessary for routine measurements of octane number in the laboratory and for control of manufacturing processes. Establishing the relationships between road and laboratory octane ratings is essential for complete antiknock information on various gasolines and their different components.

Gasoline is tested in this apparatus to determine exactly how much tetraethyl lead it contains. Tetraethyl lead is used to increase the anti-knock quality of motor fuels.




SHAMROCK

The Santa Fe Trail – 1950 Style

For many years, the majestic mesa pictured on the opposite page has looked down on the Santa Fe Trail as it winds its way from Trinidad, Colorado, around the flank of the mountain, to the top of Raton Pass in New Mexico.

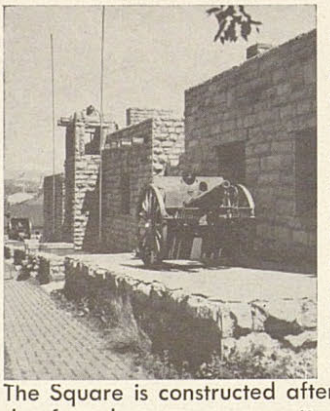
The hardy pioneers who blazed the trail traveled by horseback or wagon train. Along every slow mile of the route they were subjected to the dangers of hostile Indians, sudden storms, drought, or any of hundreds of other hardships.

These early travelers did the best they could with what they had. Even the most hardy pioneers desired to make the trip as easy as possible. They covered their wagons with canvas to protect themselves and their possessions from sun and storm. They provided themselves with the best horses, mules or oxen they could find for power to transport them over the mountains.

Soon, because Americans were constantly seeking something a little better, and because other Americans were free to provide those better goods and services, towns grew up, railroads were built, and communication lines were strung from one point to another.

Fisher's peak appears much the same today as it did a century ago. But the trail that winds around its flank has changed. Today's traveler along the Santa Fe Trail rides over a paved highway. He refreshes himself with a cold drink while a service station attendant puts fuel in his automobile — a vehicle that is equivalent in power to a hundred of his grandfather's horses. While driving along the highway, he listens to a news broadcast from a nearby radio station describing events which occurred half-way around the world an hour ago.

And as long as men are free to compete with each other, to take risks, and to demand something better, tomorrow's traveler will ride over smoother highways in a better car. As he drives along, his improved radio will bring him better radio programs. And he will enjoy a tastier cold drink while the attendant at the roadside service station fills the tank of his car with still better motor fuel.



Memorial Square at Trinidad, Colorado is a tribute to the pioneers who settled the Southwest. This interesting monument was constructed a few years prior to World War II as a shrine to the memory of the men and women who braved the hardships of pioneer life to begin the development of the West. The Square is constructed after the style of the early-day forts that once were scattered throughout the West to provide protection for the travelers and settlers of those days. In addition to serving as a monument, however, Memorial Square is also a community center and meeting place. Facilities are provided for all kinds of civic gatherings and programs. The monument is therefore a service to Trinidad citizens of today as well as a monument to the pioneers of the past.

Shamrock Purchases Banner Oil Company Of Denver, Colorado

Purchase of the Banner Oil Company of Denver, Colorado, by the Shamrock Oil and Gas Corporation was announced recently by Leo J. Wilmeth, Shamrock Sales Manager. Purchase of the Denver firm by Shamrock became effective June 1.

Prior to the sale, the Banner Oil Company had been the distributor for Shamrock products in the Denver area. The firm will now be operated as the Shamrock Oil and Gas Corporation.

L. E. Clarida, formerly owner and manager of Banner, will continue to operate the distribution facilities as Shamrock consignee. Shamrock has also employed W. H. (Bill) Carpenter, formerly Salesman for the Banner Oil Company. Carpenter has been named City Salesman for Denver.

Facilities acquired by Shamrock in the transaction include a bulk plant and a number of owned and leased service stations in Denver and adjoining vicinity. Several independent sales outlets are also being served from the Denver Bulk Plant.

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