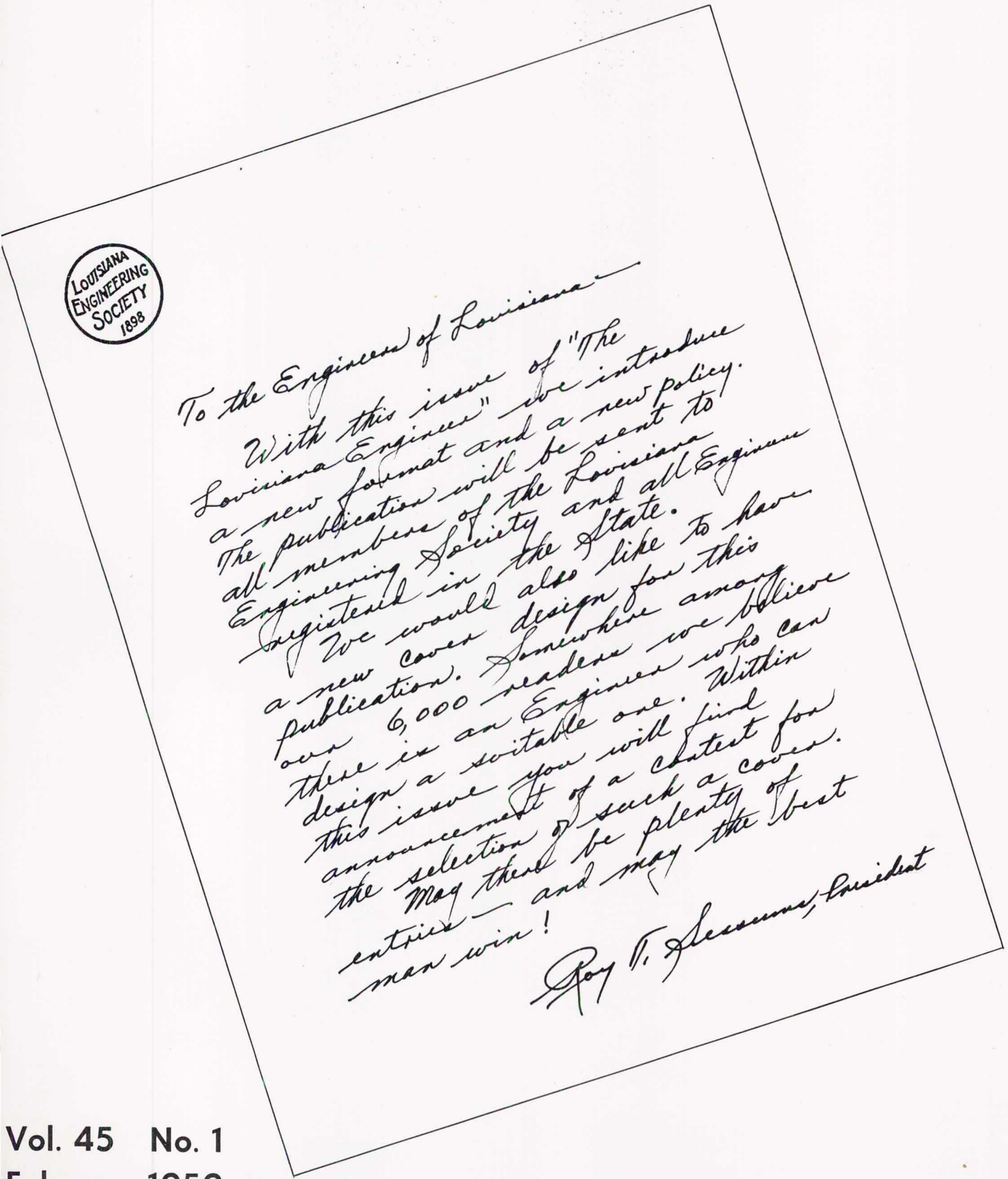
The LOUISIANA ENGINEER



Vol. 45 No. 1
February 1959

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THE LOUISIANA ENGINEER

Vol. 45 **February, 1959** **No. 1**

CONTENTS

	Page
PRESIDENT'S PAGE	3
THE STORAGE OF SOLAR POWER	4
N S P E NEWS	8
E J C NEWS	9
LAKE CHARLES AIRPORT	11
CONVENTION PHOTOGRAPHS	14
PROFESSIONAL ENGINEERS GRANTED REGISTRATION	17
THE WAY TO A GREATER PROFESSION	19
OBITUARIES	23
CONTEST RULES	24
ENGINEERING BRIEFS	25
FIELD NOTES	25
MINUTES AND BUSINESS	26
NEW MEMBERS	28

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(Continued on Page 13)

President's Message

We are entering into the first full year of affiliation with the Engineers Joint Council and the National Society of Professional Engineers. It is believed all members of the Louisiana Engineering Society should attempt to become more thoroughly familiar with both of these organizations and the services which each renders. Therefore, I would urge that all of us take an active interest in both of our affiliate organizations.

Several items of "continuing business" should be strenuously pursued, such as increasing our membership, the improvement of our professional licensing law, more widespread participation and sponsorship of our Jets clubs and full and vigorous support of our Vocational Guidance Committee's work, as well as a vigorous public relations program.

It is believed the Louisiana Engineering Society can and should exert continuing and increased effort toward informing the public and the profession of the services the professional engineer can and should render not only to his client but to the public as a whole. Such an educational program would result in benefits to all concerned.

The Section Coordination Committee meeting scheduled for March 21 at Alexandria should have a major attendance inasmuch as this annual meeting enables each and everyone of us to obtain a closer view of the work of our society. It is believed the meeting last year was a most successful one and we expect the coming meeting to be of the same stature.

I urge the continuing full cooperation of our membership not only on the above items but in matters of interest to our Society.

/s/ Roy T. Sessums.



—o—

Biography — Roy T. Sessums

A native of Pioneer, La., Mr. Sessums was graduated from Pioneer High School and received his bachelor of science degree in civil engineering from Louisiana Polytechnic Institute, Ruston, in 1935. He received his master of science degree in engineering from Louisiana State University in 1936 before doing a year of advanced graduate study at the University of Minnesota.

From 1937 to 1940 he was instructor and later assistant professor of engineering at Louisiana Tech and in 1940 he was named dean of its School of engineering.

In 1942 he was granted a leave of absence and was commissioned a first lieutenant in the Army Air Forces. He was assigned to the Training Aids Division and later to the office of the assistant chief of staff for training at the Pentagon. He served in Europe with the U. S. Strategic Bombing Survey, which unit he later commanded. He is presently a reserve colonel assigned to the Air Research Development Command, Air Force Missile Test Center, at Cape Canaveral, Fla.

He continued as dean of engineering at Louisiana Tech until 1952, resigning to become director of the Louisiana State Department of Public Works. In this capacity he was responsible for administration of statewide planning, flood control, inland navigation and drainage, aeronautics and other engineering services. He resigned that post in 1955 to join Freeport Sulphur Company as assistant to vice president and coordinator of engineering.

From 1948 to 1952 Mr. Sessums was employed on a part-time basis as consultant and operations analyst to the Operations Research Office, Department of the Army, and in 1950 went to Korea for four months as operations analyst for classified research projects.

He is a director of the Mississippi Valley Association and the Intracoastal Canal Association of Louisiana and Texas; regional vice president of the Air Force Association; president of the Louisiana Engineering Society; and past president of the Louisiana section of the American Society of Civil Engineers, the Louisiana Department of the Society of American Military Engineers and the Louisiana Department of the Reserve Officers Association.

The directors of Freeport Sulphur Company elected him assistant vice president in October, 1958.

The Freeport official is listed in Who's Who in America, Who's Who in Engineering and Leaders in Education. He is married to the former Pearl Brown of Gatesville, Tex., and they have one daughter, Bessie. They reside in New Orleans.

The Storage of Solar Energy

John J. McDow and James S. Boyd

Storage of solar energy has taken place throughout the ages past and has been preserved in convenient concentrated packages in the form of coal, oil, and natural gas. Solar energy is still being constantly furnished through photosynthesis in plants, direct heating of the surroundings, wind power, and water power. But, the storage of the surplus energy into fossil fuels or any other known form is not taking place at the rate the stored energy is being utilized. Rapid depletion of these known sources of stored power has given stimulation to devising methods for capturing energies in other forms. Atomic energy will soon attain a respected position for furnishing useful power over wide areas, but the sources of stored energy in the form of raw materials for power generation by fission are limited and will eventually become exhausted. However, the fusion process, when fully developed, will not be limited by the lack of raw materials.

Other than the processes and materials mentioned above, large quantities of usable energy are available only in the form of daily solar radiation striking the earth's surface. This radiation is so vast that a study of its rates stimulates the imagination as to the wide possibilities of its use if efficiently and effectively captured.

Solar energy is striking the earth's surface at an annual rate equivalent to the energy in 122 trillion tons of coal. The amount of energy received in three days is equal to the energy value of all the fossil fuels stored throughout the ages past. By a smaller comparison, a 1000 square foot area will receive in one day energy equivalent to 20 gallons of fuel oil. By selecting conservative operating efficiences in the design of heat collectors and machines utilizing this energy, it was determined that the average usable energy rate received in Arizona is about 50 hp per acre.

———o———

ABOUT OUR AUTHORS

John J. McDow is a graduate of Michigan State University with a Ph.D. in Agricultural Engineering. His undergraduate work was at the University of Tennessee. He presently is Professor and Head of the Agricultural Engineering Department of Louisiana Polytechnic Institute. He is a Registered Professional Engineer in Louisiana and in 1956 served as Chairman of the Louisiana Agricultural Engineers Association.

James S. Boyd is at present a Professor in the Michigan State University. He graduated from Iowa State College with a Ph.D. in Agricultural Engineering.

Paper presented at the Annual Meeting of the American Society of Agricultural Engineers, June 23, 1958, Santa Barbara, California.

Solar Energy Availability

The first consideration in solar energy storage and utilization is that of its availability. Only by having adequate knowledge of its intensity and frequency of occurrence can a workable collector and storage unit for a locality be properly designed. Becker and Boyd[1] made an extensive study of solar radiation as affected by season, latitude, altitude, degree of coludiness, and orientation of surface for several localities in the United States. Their results can be used to predict the local variation. Hand[6] has developed a system of isolines denoting the average solar heat in Btu per square foot per average day for the United States. These are valuable tools for overall planning, and their general benefits should not be overshadowed by their limitations.

The United States Weather Bureau has some seventy stations reporting the daily energy rates actually received on horizontal surfaces at these localities. These data are reported in Langley units (one Langley unit equals one gram calorie per square centimeter or 3.69 Btu per square foot). These data show the wide variation of daily rates within a single month during any one year and form year to year. Careful study of the data over a period of years is necessary to obtain optimum values suitable for use in design of solar energy systems.

A statistical analysis of 14 years of solar energy data taken at East Lansing, Michigan,[8] was made. Cumulative probability curves for daily solar radiation rates were developed for each calendar month. Comparison of normal cumulative probability curves drawn from tabu-

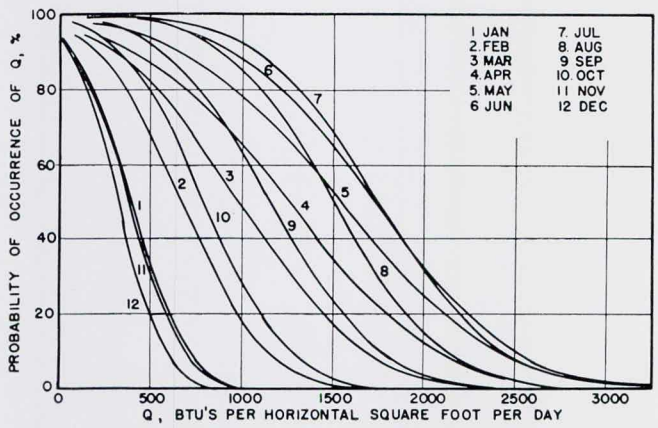

FIG. 1. CUMULATIVE PROBABILITY CURVES FOR DAILY SOLAR RADIATION RATES CALCULATED ABOUT THE MEAN FOR EAST LANSING.

lated raw data for the 14 years showed the two families of curves to be very similar, which gave confidence in the validity of the normal curves for this period. Data for longer periods of time would improve this confidence. The cumulative probability curves calculated about their mean are shown in Fig. 1.

Information is derived from these probability curves for design work by first selecting the percentage of time the solar energy is required to be received into the system during a particular month. The daily energy in Btu received per horizontal square foot can then be taken from the curves. An example could be used in drying grain in October and assuming that the system will require a given amount of heat 80 per cent of the days to operate satisfactorily. At East Lansing, 500 Btu per horizontal square foot-day would be expected to be received. This rate would be increased by 65 per cent or to 825 Btu by tilting the heat collector at an angle of 48° with the horizontal.

The amount of variability of daily radiation rates within a month from year to year is one of the controlling factors in the selection of the probability of a given radiation rate being obtained. Coefficients of variation (standard deviation divided by the mean) give an indication of this factor and were calculated on a monthly basis for the East Lansing data. They are shown in Fig 2.

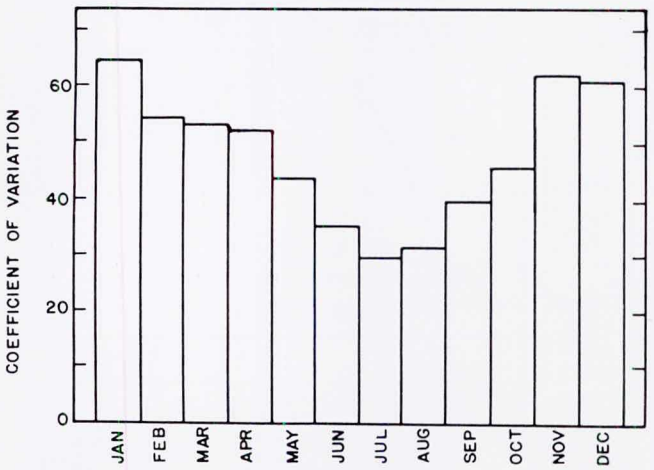

FIG. 2. COEFFICIENTS OF VARIATION FOR DAILY SOLAR ENERGY RATES AT EAST LANSING.

The frequency and magnitude of variation from the mean daily radiation rate for a given month are directly proportional to the coefficient of variation. As might be expected, the daily solar radiation rates are much more variable about their means in winter months than in summer months. However, it was found that the maximum value which is likely to occur in a given month will be about the same from year to year. The minimum expected daily rates for any one month will vary widely from year to year because of the wide variation of cloudiness that may occur. Coefficients of variations for the daily rates may also prove to be valuable for project-utilization to other localities.

Selection of a Storage Medium

Storage of solar energy over periods of cloudiness or night-time is a pressing problem. An economically acceptable solution of this problem would enable the use of solar energy in places where it is now impossible. U. S. patents on solar energy devices in the late 19th century indicated a great concern for this aspect, and it is still true today. Storage of this energy can be accomplished by several principles — sensible heat, phase-change of a material, photosynthesis process, and photovoltaic effect.

At the present time, it appears that storage in the form of sensible heat is the most suitable for agricultural purposes. Application of heat-storage materials in recently constructed solar heating systems has been limited to three kinds — rocks, water, and phase-change material. Each has shown distinct advantages and disadvantages, which will govern the selection of the proper storage material for a specific application. In general, the final selection will be determined by the type of solar collector in the system, allowable space for storage, general design of system, and, in summary, the over-all cost of utilization of each material.

Water is superior as a sensible-heat type storage material over most other materials except a phase-change material. The fourth solar-heated house sponsored by the Massachusetts Institute of Technology is to use water as the storage material. Its use requires a water-type heat collector unit and another heat exchanger at the storage location.

Materials having a large phase-change enthalpy within normal storage temperature range (90° F to 120° F) have more than six times the energy storage capacity as that of water. Glauber salts, having a heat of fusion of about 110 Btu per pound and costing about $10 to $20 per ton, is one example. One important restriction in its use is that it has a limited crystallization velocity of about "0.02 inch per hour per °F temperature difference between the solid and liquid."[9] A relatively thin, expensive container would be necessary to obtain a suitable geometrical configuration for sufficient heat transfer.

Rocks and many other common solid materials offer only about 55% heat storage capacity as compared to water. However, rocks offer many other advantages as a storage medium, such as: (1) configuration of material provides a self-contained heat exchanger, (2) heat loss due to conduction is low because of point to point contact, (3) low initial cost, (4) minimized depreciation, costs of maintenance, and repair of storage material, (5) installation without skilled labor, (6) low energy consumption for forced air movement through heat exchanger. Rocks from ¾-inch diameter (7) to four-inch diameter (2) have been used as a storage medium in systems for several houses.

Design of Rock Storage System

The determination of the optimum size rock for a regenerative storage system was made by using the heat transfer equation for spherical bodies in a heated medium as given by Boelter et al.[3]

A four-inch diameter rock was calculated to be the optimum size for heating (or cooling) periods of one hour when having a surface conductance coefficient, h, between the moving air and the rock surface of six Btu per (hr) (°F) (sqft).

Four-inch diameter spheres, were molded from a controlled mortar mix. Thermal and physical properties of the special mix were determined. The thermal conductivity, k, was found with a guarded-hot plate; the specific heat was determined with a calorimeter; and the density was calculated by normal laboratory procedure. Using the obtained values, the theoretical heat storage capacities, as varied with time, Θ, and surface resistance, h, were calculated and plotted in Fig. 3. Note that for all

values of the surface resistances, the total heat accumulated per °F temperature difference approached asymptotically the value of 0.5 Btu. The observed cumulated heat gained values in a sphere are plotted in Fig. 4. These tests show that in all tests the value of 0.55 Btu heat gain per sphere was approached asymptotically. The discrepance of 0.05 Btu between observed and theoretical is most likely because of stray radiation.

Calculations showed that energy transferred from constant temperature moving air to a four-inch diameter sphere in Btu per °F did not accumulate at a much higher rate for surface conductance coefficients over six. Higher air velocities, and therefore greater operating costs, would be necessary to obtain the higher-valued coefficients without comparable increased returns. Experimental data verified the theoretical calculations and gave very similar results.

$$Q = 8\pi r_o \rho c (t_i - t_f) \sum_{n=1}^{n=\infty} \frac{[\sin M_n - M_n \cos M_n]^2 [1 - e^{-(M_n^2 \alpha \Theta / r_o^2)}]}{M_n^3 [M_n - \sin M_n \cos M_n]}$$

Q - Cumulative heat per sphere, Btu

r_o - Surface radius of sphere, feet

ρ - Density of material, lb./cu.ft.

c - Specific heat, Btu/lb.°F

t_i - Initial Temperature, °F

t_f - Film Temperature, °F

M_n - Roots of transcendental equation
$N_u = 1 - M_n \cot M_n$

N_u - Nusselt number, hr_h/k

α - Thermal Diffusivity k/c .sq.ft./hr.

k - Thermal conductivity, Btu/hr.°F.sq.ft./ft.

h - Surface resistance, Btu/hr °Fsq.ft.

r_h - Hydraulic radius

Θ - Time

HEAT TRANSFER EQUATION

A small cylindral storage unit containing 189 four-inch diamteter concrete spheres was constructed. The laboratory unit used an electrical heating element as its energy source so that close control could be had on the heat input. Control spheres having themocouples molded within were spaced systematically throughout the unit to provide means of checking the top layers first, giving up heat to each succesive layer. The air flow rate was varied from 320 to 1883 pounds per (hr) (sqft). Tests covered temperature rises for the air from 33 to 123 °F, with the higher temperature increases being at the lower air velocities.

The effectiveness of the regenerative storage unit during heating periods was determined quantitatively on the basis of the per cent of available heat the air releases to the spheres during the progress of storage. The energy released after 1½ hours operation was 79 per cent of the available energy for the lowest velocity, as compared to 33 per cent for the highest velocity. Lower velocities, therefore, appeared to be more suitable from the stand-

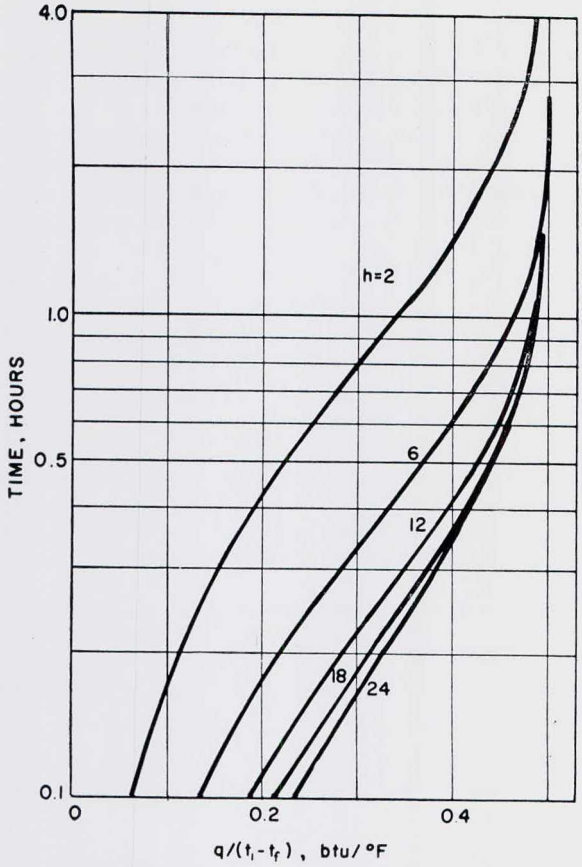

FIG. 3. THEORETICAL CUMULATED ENERGY IN 4 INCH DIAMETER SINGLE SPHERE.

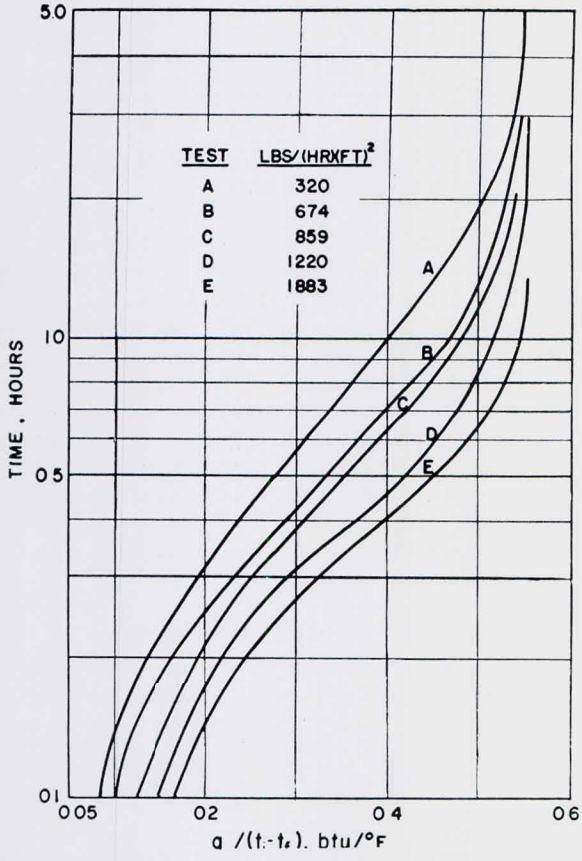

FIG. 4. OBSERVED CUMULATED ENERGY PER °F TEMPERATURE DIFFERENCE IN SINGLE 4 INCH DIAMETER SPHERE.

point of higher efficiency of energy released and lower cost for moving the air through the system. Typical heating curves for one test are shown in Fig. 7, and storage and recovery curves are shown in Fig. 8 for a different test.

Heat retention within the storage unit during the holding period will depend essentially on four factors: (1) temperature gradient between the spheres and the surrounding medium, (2) the insulation effectiveness of the material enclosing the storage unit, (3) the length of holding period, and (4) the ratio of the storage material bordering the sides of the container to the total volume.

In this small laboratory unit, 31 per cent of the storage medium was in contact with the sides. By projecting the results of smaller unit to a twelve-foot cube with 15 per cent of the spheres adjacent to the sides, the larger unit would have retained 67.2 per cent of the stored energy after 72 hours. The mean temperature difference between the spheres and outside air temperature was about 45°F during storage time.

Recovery of the thermal energy from the spheres was made by reversing the air flow direction. This enabled the maximum thermal energy to be recovered without heating the lower spheres to a higher temperature. Approximately 78 per cent of the available heat was recovered at the lower velocity of 519 pounds per (hr) (sqft) with the air temperature rise range of 61-10°F.

Application

The size of a collector and storage unit was calculated for a poultry house in Michigan as described in Table I. The maximum storage period in this case would be 16 hours.

Table I. Proposed Solar Heated Poultry House

Location: Michigan
Size: 36′ x 108′
No. of birds: 2200
Moisture to be removed by fans: 40.9 lb/hr
Air temp. rise: 30° F.
Daily solar energy collection: 616,800 Btu

January Probability	Collector Size	Air Temp. Rise	Size of Storage
%	SqFt	°F	CuFt
80	1908	55.1	348
60	1090	41.6	462
40	847	35.5	541

(Poultry house data were taken from Esmay and Moore.[5])

Note should be made of the fact that the larger collector is necessary when using a higher probability of receiving a given amount of solar energy per square foot. Also, a smaller storage unit is necessary when using a larger collector because of the higher temperature rise of the air. Location of such a storage unit beneath the building in which the heat is to be used would not only reduce heat losses to the outside of the building but also minimize the cost of construction.

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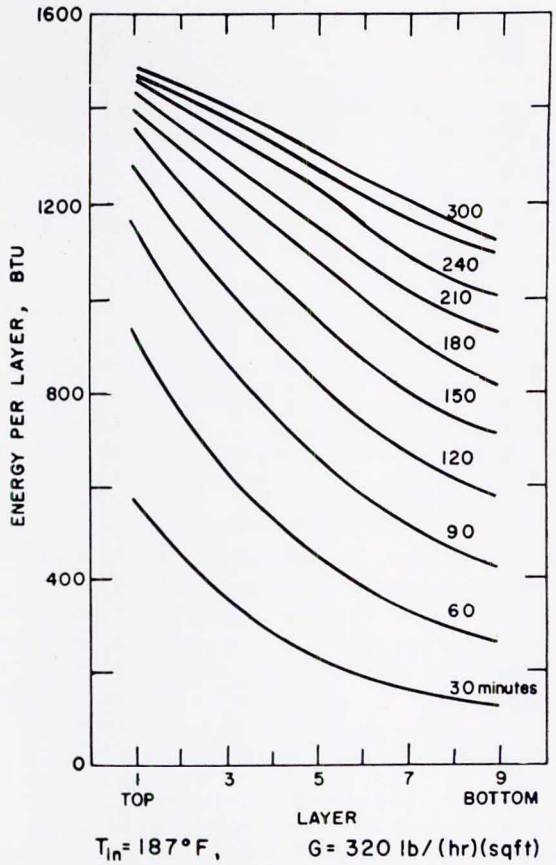

FIG. 7. ACCUMULATE ENERGY DURING HEATING.

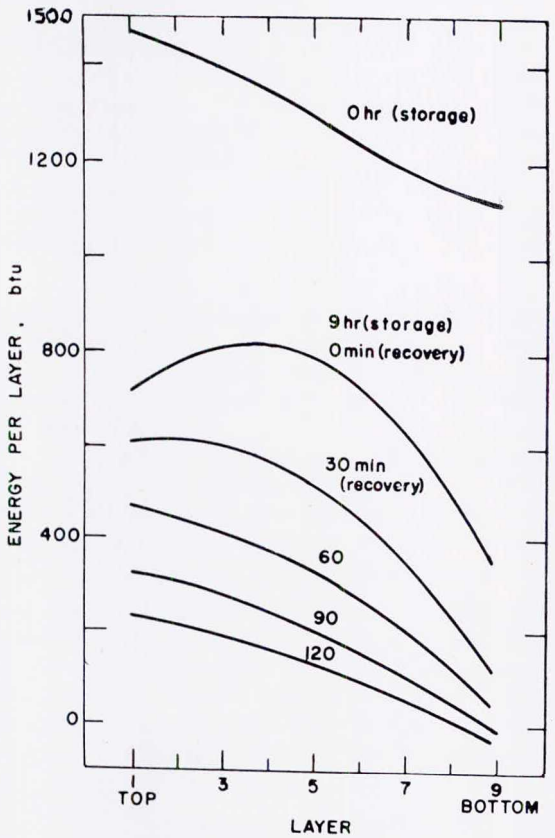

FIG. 8. ENERGY LEVEL DURING STORAGE AND RECOVERY, AIR FLOW RATE 518 lb/(hr)(sqft)

N. S. P. E.

Criticize Management Neutrality

NSPE President Clark A. Dunn noted in a press interview that employers should take a more positive attitude in metting unionization attempts among engineering employees. Dunn criticized those who take a neutral attitude in such situations, terming it "an abdication of management's responsibility in preserving the distinction between professional and nonprofessional services." He said that "such an abdication of management responsibility has led to a situation in the aircraft and other industries here on the West Coast in which many young engineers have never heard an expression of support concerning professionalism from their employers."

Stop New Shortage Claims

In a formal statement, the Board issued a plea to stop "adding fuel to the shortage fire," calling upon all communications media to "weigh carefully the facts, and soberly analyze those facts, before starting a new wave of publicity to the effect that the nation faces a severe engineering manpower shortage." The statement was prompted by several recent articles and statements that a severe "shortage of engineers" was in the offing.

Use of Engineering Seals

Action on the use of engineering seals on plans, drawings and other documents followed an unsuccessful union attempt to place the union seal on engineering documents filed with a public body. The adopted policy deals with the issue more broadly, stating that the use of any seals or markings on engineering documents, other than the engineers' seal and others required by law, is improper and should be disapproved by public officials and others responsible for the receipt and approval of engineering documents. The statement adds that the intent of the state registration laws will be clouded by permitting markings or seals that have no relationship to the professional qualifications of those preparing the documents.

Outside Practice

To deal with the issue of outside consulting practice by employed professional engineers, the Board approved a policy statement, as follows:

> "Employed professional engineers may engage in outside professional practice on an individual voluntary basis within the limitations of applicable laws, regulations and ethical standards."

The statement was prepared jointly by the functional sections of engineers in private practice and in government employment, but is applicable generally.

ESPS to Recruit for Federal Agencies

The Engineering Societies Personnel Service has been designated by the U. S. Civil Service Commission to recruit engineers and scientists. Federal policy permits the use of non-profit professional employment services to secure applicants for Federal employment in hard-to-fill engineering and scientific positions.

Better Communications

"Better Business Relations Through Employee Meetings," Chamber of Commerce of the U. S., Washington 6, D. C., 50¢ per copy — Though not limited to engineers, the 24-page illustrated publication is a practical and useful tool to improve engineer-management communications.

Contact with Congressional Candidates on NSPE Legislative Matters Proves Highly Effective

In conjunction with the recent congressional elections, many state societies of professional engineers undertook a program of *contacting congressional candidates from their respective areas*, informing them of NSPE's position on several legislative matters and in turn, requesting comments as to their views with respect to such proposals. This effort, initiated by the Wyoming Society of Professional Engineers, was suggested to all societies in a memorandum from NSPE's Legislative Chairman, Robert F. Miller, with the thought that others might wish to follow Wyoming's example and undertake similar ventures.

Two successful and fruitful programs were undertaken by the West Virginia Society and the Southwestern Chapter of the Connecticut Society which contacted every House and Senate candidate from those areas requesting their views on certain specific legislative proposals with which NSPE is actively interested, such as Jenkins-Keogh, the offer of engineering services by TVA and amendments to the Taft-Hartley Act. The West Virginia Society's contact letter, together with all replies received from the candidates, were reproduced in the November issue of the "West Virginia Engineer." Response from the candidates was extremely gratifying, with *practically all indicating their agreement with NSPE's position* and many promising active support if elected to the next Congress.

These preliminary contacts should prove extremely valuable as a basis for more personal communication at a later date when NSPE's legislative efforts will once again move into high gear. With this background the Society will gain an appreciable insight as to which members of Congress it might count on for active support and interest on legislative matters affecting the engineering profession.

State Department Soon to Name Science Attaches

The State Department expects to announce in a few weeks the assignment of a group of *eminent scientists to serve in United States embassies as scientific advisers to U. S. ambassadors.* This scientific attache program was established in 1951, but allowed to lapse in 1956. Following Sputnik I, the President urged that it be reactivated, and it has taken almost a year for the State Department to recruit suitable scientists who are qualified and willing to serve as science attaches.

As viewed by the State Department, the primary role of the scientific attaches will be to act as advisers to the ambassadors on scientific matters and to establish contacts with foreign scientists, rather than to gather detailed scientific information about research in foreign countries. The program calls for the assignment of two attaches each to nine major U. S. embassies.

E. J. C.

U. S. TECHNOLOGISTS ABROAD

Current figures supplied by the International Cooperation Administration reveal that more than 2000 American scientists and engineers are engaged in the worldwide activities sponsored by ICA. The magnitude of the ICA program may be judged from the following data: Requests for technical assistants in agriculture have resulted in the establishment of 1028 positions in 60 countries. Nearly 200 of these positions are as yet unfilled. In health and sanitation activities, 80 of the 398 positions are still open. In the programs dealing with industry, mining, and transportation, 88 of the 691 positions are unfilled.

The International Cooperation Administration operates in 66 countries — 8 in Europe, 9 in Africa, 9 in the Near East, 5 in South Asia, 10 in the Far East, and 25 in Latin America. The latter figure includes all the Latin American republics, Trinidad, British Guiana, British Honduras, Jamaica, and Surinam. Most of the vacancies are in the Far East, South Asia, the Near East, and Africa. There are, in addition, 1500 scientists and engineers working for the technical cooperation programs through private industry and U. S. universities. In the past three years the demand for personnel has increased more than 40% and ICA's employment division is definitely in the market for recruits.

There is no accurate count of the total number of American scientists and engineers working abroad. Without question the largest and most homogeneous group consists of the geologists, geophysicists, and construction, petroleum, and chemical engineers employed in the oil industry. For some unaccountable reason, these men have never been tabulated in the surveys made by the Bureau of Labor Statistics and the National Science Foundation. The mining industry accounts for another substantial number, which can only be approximated. As a guess, the number of American engineers and scientists working abroad is considerably in excess of 15,000 and comprises a corps that can — and no doubt does — exert a great deal of influence in the international technological offensive.

The State Department estimates the number of Communist technicians in underprivileged countries at 1600. Approximately half of them come from the Soviet Union, and the remainder from the other Iron Curtain countries. Nearly all of them are engaged in industrial activities — comparatively few in agriculture, and even fewer in health and sanitation. According to the State Department, the largest single group (470) is in the United Arab Republic, and there are roughly 450 in Afghanistan, 280 in India, 105 in Indonesia, and 60 in Burma. Clearly, the Communists believe in strategic concentration, as well as in practical and tangible results. There is little altruism discernible in the Soviet effort in the underdeveloped countries.



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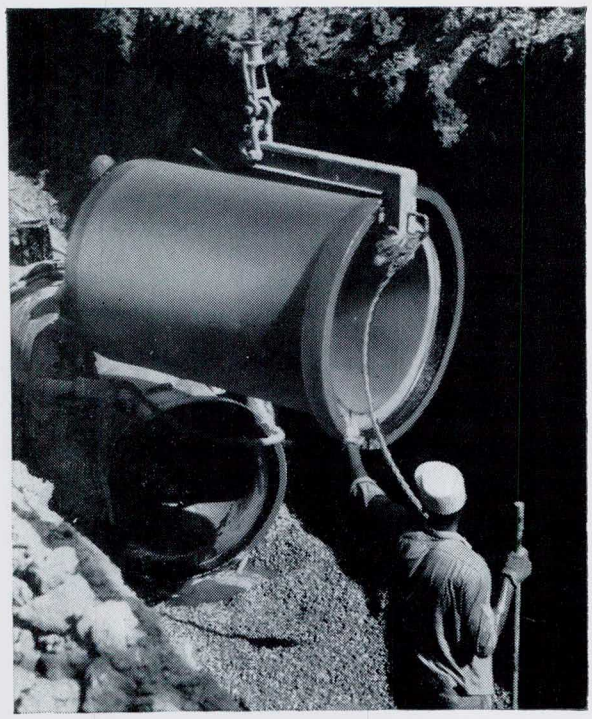

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LAKE CHARLES AIRPORT

Rodney Vincent

Prior to 1941, the Parish of Calcasieu, Louisiana, owned a small airport with turf runways, which comprised approximately 257 acres located near the center of the present Lake Charles Air Force Base East of Lake Charles, Louisiana.

In August of 1941, the U. S. Government indicated that a medium bomber training base would be located at Lake Charles on the site of the original airport mentioned above, subject to the Parish acquiring certain lands. At that time, the Parish purchased approximately 450 acres of land from Stanolind Oil and Gas Company and the temporary Air Force training base was created and operated as such from 1941 until 1946, approximately. During this period of time the Government acquired an additional 715 acres of land to enlarge the Air Force Base, which made a total of approximately 1420 acres of land contained in the Lake Charles Air Force Base at the end of World War II.

In 1946, the U. S. Government saw fit to deactivate the Air Force Base and return all land and improvements to the Parish of Calcasieu for maintenance.

During the period 1946 to 1951, the Parish of Calcasieu maintained the Air Force Base, leased the various buildings where possible, furnished necessary facilities for Eastern Airlines to operate in and out of Lake Charles and was tentatively planning the construction of a new Airport terminal building at said base.

In 1951, the U. S. Government saw fit to reactivate the Lake Charles Air Force Base as a SAC Base which was intially used by two wings of B-29's and which at a later date after completion of the construction of a 200-foot by 11,500-foot runway, was utilized by two wings of B-47 jet bombers, which comprises the 806th Air Division.

As soon as the U. S. Air Force reactivated the Air Force Base, a large construction and improvement program for the runways and building was commenced and all civil traffic was required to be housed and utilize approximately 100 acres of land on the extreme East side of the Air Force Base. A 3000-foot turf runway was constructed in the civilian area which was parallel to the Air Force main instrument runway and at a distance of 750 feet therefrom. Civilian traffic either operated on the turf runway or by executing the necessary forms under Air Force regulation 87-7 and according to the terms and conditions of a joint use agreement between the U. S. Government and the Parish, utilized the military runway.

After a period of time it appeared that due to the large number of Air Force Jet operations at Lake Charles Air Force Base, it was very difficult for civil aviation to exist to any degree, much less for it to increase. Due to the complications presented by the requirements of Air Force regulation 87-7, many itinerate aircraft avoided Lake Charles and small civil aircraft did not desire to operate in the same traffic pattern with B-47 jet bombers.

Early in 1954, Parish officials, City officials, and local business and civic leaders recognized the problem which had developed insofar as the growth of civil aviation at Lake Charles and due to the fact that the facilities for the commercial airline service was very limited and due to the fact that it was known that new airline service was to be scheduled for Lake Charles in the not too distant future, it was agreed that some move should be made to solve the problem.

Some of the original ideas presented for solving the situation involved construction of a new municipal airport for Lake Charles, however, when this was first considered, it was pointed out that a serious problem would be created in the event Lake Charles Air Force Base was deactivated and the Parish of Calcasieu would then be in the position of having two complete airport facilities at Lake Charles.

It was decided that the solution was to determine if Lake Charles Air Force Base could be declared a permanent air force base of the Strategic Air Command, that the community would be more inclined to build a new municipal airport for civil and commercial aviation.

In line with the reasoning, the Calcasieu Parish Police Jury adopted a resolution in April, 1954 wherein they agreed to donate all the Parish rights at the Air Force Base to the U. S. Government, together with other lands and concessions which might be agreed upon providing the Air Force would declare Lake Charles Air Force Base as a permanent installation rather than a temporary installation at it was then classified.

After adoption of this resolution, a representative group of the community, together with Parish and City officials, went to Washington and appeared before H. E. Talbot, who was then Secretary of the Air Force and made a formal presentation to him of the entire plan.

In August of 1954, a letter was received from the Secretary of the Air Force stating that the Air Force currently had authority to create some additional permanent Air Force bases in this country and would consider Lake Charles Air Force Base as a permanent military installation provided 11 basic criteria could be met.

These 11 criteria, among others, included that the Air Force Base be under exclusive control and jurisdiction of the Air Force, that the Government have fee-simple title to the property, that the Base be adaptable to meet the long-term development trends and needs of the Air Force, that the Base be in proximity to a civilian community capable of providing the esential community facilities required, that certain lands be acquired for expansion of the Base, that the Base be free from industrial or civilian activities or endemic health conditions detrimental to safe flying and living conditions.

The primary requirements which presented the biggest obstacle to surmount were the exclusive use feature which

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Delivered at the September Meeting of the Lake Charles Section.

required construction of a separate municipal airport for Lake Charles, the acquisition of approximately 700 acres of land by the Parish, to be donated to the U. S. Government for expansion of the Lake Charles Air Force Base, and improvement of the storm drainage facilities and protection from back water flooding, which were detrimental to the city of Lake Charles and which had been also very detrimental to the Lake Charles Air Force Base, particularly in 1953.

To meet these demands, two separate bond issues were called for a vote in March, 1955, one being in the amount of $5,500,000.00, which was voted by an airport district comprising the Lake Charles area with said funds to be utilized to purchase the land required for expansion of the Air Force Base and with the balance to be used for the construction of a new municipal airport at Lake Charles at a new location to be determined. The other bond issue voted on the same date was in the amount of $8,170,000.00 voted by a local drainage district to improve the storm drainage and flooding conditions of the area. These two issues were carried by a majority of approximately 8 to 1.

After the passage of these bond issues the Parish was advised that Lake Charles Air Force Base would be considered as a permanent S A C base subject to the fulfilling of the various conditions and that all future structures erected on said base would be of a permanent type rather than a temporary type as in the past.

The next step in the development of the new municipal airport for Lake Charles, La. consisted of getting the approval of the Department of Commerce through the Air Coordinating Committee for the construction of a new municipal airport for Lake Charles as well as obtaining the necessary approvals for the exact location of said new municipal airport.

These approvals were necessary before any Federal Aid could be approved for said new airport and said approvals were also required before commercial aviation could operate in and out of said new facilities.

In line with this procedure, the Airport Use Panel of the Air Coordinating Committee met in Lake Charles in July, 1955 to consider the termination of joint use of the Air Force Base by civil aircraft and also to consider approving the construction of a new municipal airport for Lake Charles, La.

The result of their original study was to refer the case to the Regional Air Space Sub Committee at Fort Worth, Texas, to consider the various proposed sites in the Lake Charles are which might be used for construction of a new municipal airport. The result of the Fort Worth meeting was that no site was approved as desirable for construction of a new municipal airport due to the proximity to the Lake Charles Air Force Base and the entire matter of site approval was referred by them to their parent organization in Washington, namely, the Air Space Panel which considered the Lake Charles case on December 6, 1955. The findings of the Air Space Panel at the Washington meeting were that the construction of a new municipal airport by the Calcasieu Parish Police Jury at the site proposed (Latitude 30° 7′ 30″ and Longitude 93° 12′ 50″) is acceptable air spacewise and if an airport is constructed by the Parish at the site proposed, it will be possible to conduct simultaneously instrument operations at both the new airport and Lake Charles Air Force Base without unacceptable delays. The Air Space Panel forwarded these recommendations to the Airport Use Panel together with the fact that consideration should be given to the providing for such additional facilities as may be found necessary or desirable in handling simultaneous operations including construction of a crosswind runway, installation of I.L.S., control tower, operation of RAPCON, approach control, etc. A recommendation was also made that the Parish make the necessary relocation of radio towers in the area, which are obstructions in accordance with C.A.A. TSO-N18.

After considering all of these factors, the Airport Use Panel of the Air Coordinating Committee in Washington made a final recommendation on the matter on February 27, 1956, wherein they stated that the Airport Use Panel will not object to the construction of a new civil airport by the Calcasieu Parish of the site proposed and therefore recommended termination of joint civil-military use of the existing Lake Charles Air Force Base at such times as the new airport becomes operational and the recommendations of the Air Space Panel in its meeting of December 6, 1955 are implemented.

This final recommendation cleared the way to proceed with the acquisition of land as well as the construction of the new Lake Charles Municipal Airport.

Original tentative master plan airport layouts were submitted to the CAA in March, 1956 and after a series of conferences in Lake Charles, La., Jackson, Mississippi, and Fort Worth, Texas, relative to wind rose information, airport classification, runway orientation, runway lengths, and types of construction to be used, a master plan was approved tentatively for the new Lake Charles Municipal Airport in August, 1956. In the meantime, during the latter part of 1956, the land required for construction of the new municipal airport was acquired by the Parish. Due to the fact that the Parish was unable to acquire said land on an agreeable basis, exproporation suits were carried out in District Court during the last half of 1956, wherein 1650 acres of land were acquired for a total consideration of $1,336,479.67.

The Parish of Calcasieu applied for Federal Aid for said new airport under the current Federal Aid Act and was tentatively allocated $900,000.00 for the fiscal year 1957, $350,000.00 for the fiscal year 1958, and $342,-500.00 for the fiscal year 1959. All Federal allocations as cited above will have to be matched on an equal basis by the Parish on approved projects to be utilized.

The CAA approval of the master plan classified Lake Charles as a trunk station and a total length of runway was approved by the CAA of 5000 feet for the instrument runway. It was therefore indicated that any additional length over the above 5000 feet would have to be paid for entirely by the Parish of Calcasieu, La.

After further discussions with the CAA, it was determined that the CAA would participate in the concrete runways and taxiways and aprons on the basis of 45,000-pound single wheel loadings, however, it was the thought of the Airport Committee here at Lake Charles that to

provide for proper future planning, the runways should be designed to withstand 60,000-pound single wheel loadings and 80,000-pound dual wheel loadings. The local governing authority approved to pay the necessary costs over and bove CAA participation to provide a 6500-foot by 150-foot instrument runway which would be designated runway 15-33 and would be parallel to the main runway at the Air Force Base. It was further approved that a secondary crosswind runway designed 4-22 and being 150 feet by 4400 feet, would be constructed as a non-intersecting runway at the North end of the instrument runway for the convenience of smaller civil aircraft under crosswind conditions.

In studying the alignment and arrangement of the runway layouts, it was decided that in line with recent CAA criteria that fee title would be acquired to 1000 feet by 2700 feet of land at the ends of the runways to provide an absolute clear zone and that sufficient land would be purchased at the outset so that the instrument runway could be extended at a later date as required to 8500 feet and still provide the clear zones as set out above. Navigational aids which were approved for the new airport included instrument landing system, approach lights, high intensity runway lighting, control tower, joint use of Air Force RAPCON with radar surveilance and joint use of other various navigational aids presently utilized by the Air Force Base.

After various designs and layouts were mutually agreed upon by the Parish and the CAA detailed plans and specifications were prepared for the initial contract at the new airport site. This contract included all earth work, underground drainage work, sub-base, and concrete surface course for the instrument runway and taxiway 6500 feet in length and was awarded to Flenniken Construction Company in October, 1957 in the amount of $1,964,806.60.

From October, 1957 to date, work has been proceeding on this contract and due to the fact that the initial phase of said work involves the movement of in excess of 600,000 yards of earth there has been some delay due to the inclement weather experienced throughout the fall of 1957 and spring of 1958. However, the work is now proceeding at a very rapid pace and during the summer months of 1958 and as of this date, the contractor is working on a schedule of 20 hours per day and it is anticipated that the pouring of the concrete runway and taxiway will commence on or about November 1, 1958.

Plans and specifications for the concrete apron on the field site of the airport terminal building, for the instrument runway and taxiway lighting, as well as for the construction of the terminal building itself, are currently being developed. Plans will also be developed for the various improvements in the hangar storage areas as well as fences, entrance road, utilities, etc.

Due to the fact that President Eisenhower recently vetoed the new Federal Aid Act, it will be necessary to review some of the proposed projects now in the planning stage due to the fact that no additional Federal Aid can be anticipated, unless a new Act is passed by the new Congress early in 1959 to override the Presidential veto.

In any event, it is presently planned that the new Municipal Airport facility should be ready for partial occupancy on or about January 1, 1960 and should provide a modern facility which will be capable of serving the area's needs for the next 20 years.

With reference to interest in commercial airline travel in the Lake Charles area, it should be pointed out that the total enplaned passengers for the year 1953 was 12,774 and that the enplaned passengers for the year 1957 had increased to 30,496. It is currently estimated by national sources that the estimated enplaned pas sengers for Lake Charles for 1970 will be 90,000.

From these figures, it is evident that commercial air travel at Lake Charles is increasing at a tremendous rate and it is further evident that the portion of domestic travel which Lake Charles passengers represent, has increased from .05% in 1955 to .06% in 1956 to .07% in 1957.

At the present time Lake Charles has available 10 flights per day on Eastern Airlines and 4 flights per day on Trans-Texas Airways, and due to a recent decision rendered in the South Central Local Service Case, the Lake Charles area has been approved to receive considerable new service, which will represent a minimum of 5 or 6 additional flights per day.

With reference to jet airline service, which has been very much in the news in recent months, it should be pointed out that of the approximately 2600 airports in this country, which are presently available for public use, that only 100 to 150 can expect any form of jet service in the next 25 years. Further, it is expected that of these airports, only 12 approximately, will receive jet service within the next 10 years, with said service being provided between these principal cities which are a minimum of 1000 miles apart.

On this basis, it is evident that it will be sometime before commercial jet airline service will serve Lake Charles, although at a the present time medium range jet airliners are being planned and developed. The first jet aircraft to be expected here at Lake Charles will no doubt be jet executive aircraft. However, in any event all planning has been done so that when the time comes for the jet air service at Lake Charles, the new facility will easily be able to accommodate it.

STANDING COMMITTEES

(Continued from Page 2)

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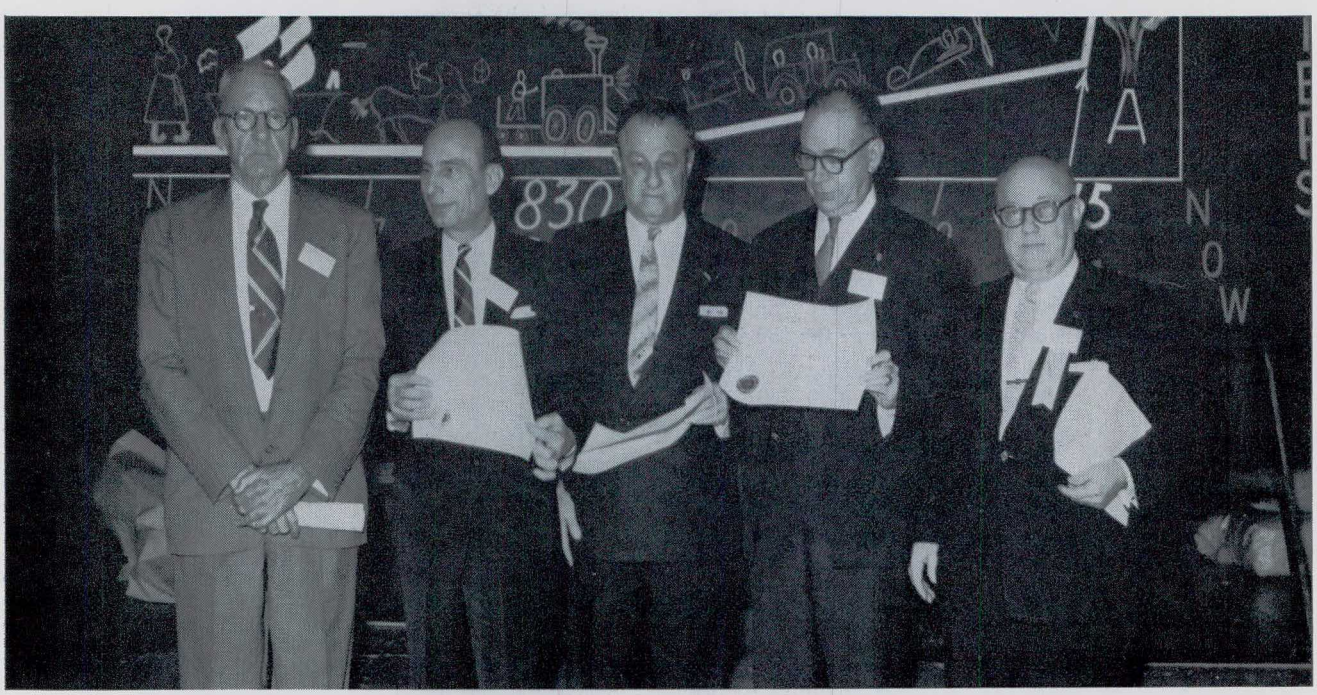

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Coats, John Greene, Jr.	506 Fairview, Bastrop, La.	Mech.
Comeaux, Leo Louis	Box 153, Port Sulphur, La.	Elec.
Conley, Patrick Edward	7004 Gllbert Dr., Shreveport, La.	Civil
Cothren, Stanley Morrow	3518 Greenway Pl., Shreveport, La.	Civil
Elder, Harvey Bernard, Jr.	109 Glenwood Ave., Harahan, La.	Petr.
Farr, Samuel Armstrong	P. O. Box 331, Port Sulphur, La.	Mech.
Gaston, Harry J., Jr.	3554 East Roosevelt Dr., Lake Charles, La.	Petr.
Gautreau, Elmo Vincent	2307 Marengo, New Orleans, La.	Mech.
Googe, William Jeremiah	3480 Johnette, Shreveport, La.	Elec.
Hall, Hervy Franklin	4207 Lamar, Houston, Tex.	Civil
Jeffus, Daniel Myron, Jr.	Rt. 2, Box 396, Cut Off, La.	Chem.
Latimer, Douglas F.	1974 Ramsey Dr., Baton Rouge, La.	Mech.
Lehman, Richard Karl	1406 S. Rendon, New Orleans, La.	Mech.
Lott, Leonard Noel	1600 Allo Ave., Marrero, La.	Civil
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Norman, William Lloyd	243 Wichita, Shreveport, La.	Mech.
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Strand, William Keith	Box 415, Millington, New Jersey	Civil
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Tisdale, Lucien Eugene	501 Fairview Dr., Bastrop, La.	Mech.
Warren, James Edward	2933 Cambronne, New Orleans, La.	Elec.
Edmondson, Charles Horace	745 Wade, Beaumont, Tex.	Mech.
Heller, Friedrich Richard	2221 Abundance, New Orleans, La.	Mech.
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Stratton, William Chester	208 Virginia Ave., Glenshaw, Pa.	Civil
White, George William	4618 Briarbend, Houston, Tex.	Mech.
Richards, Vincent L.	1023 Rittiner Dr., Baton Rouge, La.	Mech.

THE STORAGE OF SOLAR ENERGY

(Continued from Page 7)

Conclusions

Careful study of the availability of solar energy in each area of use will be necessary before design of complete units can be undertaken. Considerable progress has been made in the design and operation of solar collectors for crop drying by Buelow.[4] Satisfactory storage of solar energy for periods of no sunshine is one of the main problems needing further development.

Once the initial investment is made in solar energy equipment, the energy is almost free for the taking. Solar heating is so close to the point of being economically sound that careful attention to all design factors will be necessary. For its application to agricultural work, the agricultural engineer must fill in the necessary design data in its development. Further concentrated efforts toward capturing, storing, and utilizing solar energy should bring about many favorable changes in the present energy using systems on the farm.

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"THE WAY TO A GREATER PROFESSION"

The Louisiana Engineering Society was organized in 1898 to provide a unified voice for all engineers in Louisiana.

If you are a professional engineer registered with the State of Louisiana, you have taken only the first step toward professional practice. The law can give you legal professional recognition, but only by your own actions can you estabish your true professional status.

Many engineers have taken the next logical step in pursuing their professional goals, by joining the Louisiana Engineering Society and the National Society of Professional Engineers.

The society is continuously working with the state board of registration in administering the registration act. Furthermore, there are committees working with the state legislature and local governing bodies on problems of importance to engineers, some of which are transportation, water supplies, air pollution, the advancement of engineers in public employ and many other public service projects. At the same time, the society is working toward the economic improvement of the engineer through the nation-wide studies of wages, salaries, fees and working conditions. The society is a true professional organization and is in no way a labor union. The L.E.S. is working with educators to promote improvement of teaching methods and to assist in developing professional attitudes in engineering students.

THE SOCIETY IS

(1) Devoted to the professional, ethical, social and economic welfare of all engineers.

(2) Organized into effective working elements at the three levels of the engineer's inetrest: his local community, his state, and his nation.

(3) Governed by democratic principles determined by the wishes of individual members, expressed through local chapter representatives to the state society.

(4) A member state society of and integrated with the NSPE.

Fields of Interest

Industry	Legislation
Community Planning	Public Relations
Economic Conditions	Student Liaison
Ethical Practices	Transportation
Interprofessional Relations	Water Supplies

Examples of Activity

Working with committees on civic improvement. Study of revision of local building codes and fire prevention regulations.

Enforcement of the registration law to prevent unauthorized practice by unqualified individuals.

Public relations program at local and state levels. (Engineer's Week).

Assisting engineering students in professional aspects of their training and vocational guidance for high school students.

Greater Opportunities

Your advancement and professional stature are closely related to the status of the engineering profession as a whole. As a member of the professional society you make important contacts, broaden the scope of your interests, and thereby increase the opportunity for your greater attainments.

Greater Responsibility

Only recently has the engineering profession assumed a measure of responsibility for the social consequences of the technical advances that it has brought to society. You, as an individual and as a member of the influential group, have a greater-than-ever obligation to help shape the economic and political future of your community, your state, and your country. Your voice alone may not be heard; the voice of your national professional organization is more than 45,000 strong.

Greater Recognition

By qualifying for membership and joining the well-organized group of alert, articulate engineers you share in the recognition the group as a whole has earned. Your membership card and your certificate signify your adherence to the high standards promoted and publicized by the society at local, state and national levels.

Specifically What Membership Will Do For You

(1) It implements the objectives of registration. The engineers registration law was passed to regulate the practices of engineering. Registration is an important step in your advancement, but only when you join the La. Engr. Society and N.S.P.E. do you join forces with your professional group. Membership and active participation will enable you to take full advantage of opportunities for furthering your own personal career.

(2) It affords greater opportunities for valuable personal contacts with engineers associated with all phases of the profession. As a member you meet informed men in responsible positions — in your own field and in many others, as well. You benefit from the interchange of news and ideas and from the contacts you make.

(3) It provides interesting programs. Most engineers belong to one or more technical societies. Such founder societies are necessary and keep members informed of the latest technical developments in the individual's field; but unfortunately, tend to segregate engineers and cannot serve the interests of the profession as a whole. Membership in the La. Engr. Society and N.S.P.E. insures a common meeting ground for all engineers. Programs are built to attract men from all phases of the profession of engineering. Current problems of legislation, economics, community planning, education and public service are typical group program subjects. Progress reports made at such meetings clearly show that the society committees are working to advance the aims of all engineers toward higher planes.

(Continued on Page 21)

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"THE WAY TO A GREATER PROFESSION"

(Continued from Page 19)

(4) You will benefit by "public relations in action." Natural reticence has led, in many ways, to a lack of professional pride. While public lack of understanding and respect for the engineering profession is gradually being corrected, even today, many people do not class engineers along with other professional men. The public is not to blame, for we have yet to tell the full story. To this end, the professional society, through its public relations and publicity committees is using planned publicity to emphasize public service activities and is inviting prominent industrial and civic leaders to special engineering programs, bringing wider public acceptance of engineers.

(5) It brings you valuable news of your profession through national and regional publications and bulletins. The "American Engineer", a monthly magazine published by NSPE and the "Louisiana Engineer", bi-monthly, along with frequent legislative bulletins from Washington and your area, keep you in touch with developments affecting your profession on nationa, state and local levels.

(6) It helps to safeguard ethical standards in the profession. A "code of ethics" committee constantly promotes high standards and has the power to act in cases of misrepresentation or violation of those standards.

(7) It analyzes, endorses and helps to formulate legislation important to the welfare of the individual and the profession. Your local, state, and national organizations are constantly in touch, through committees and legislative analysts with latest developments. When an organization consisting of more than 45,000 engineers expresses interest in a certain law, the legislators are bound to consider their requests more seriously. For example, NSPE strongly favors retention of the professional clauses in our labor laws. Such guarantees should be incorporated in any such legislation. At the state level, we sponsor bills in the legislature to strengthen the engineers registration act and to otherwise protect and promote the professional interests of registered engineers.

In times like these, it is essential that all engineers speak in a strong voice for the things that we want; otherwise, we shall lose our identity and professional status.

(8) It promotes the economic standards of professional engineers and thereby advances the opportunity for advancement of all professional engineers. Constant attention and study is made of compensation patterns in various fields of engineering work.

(9) It helps to raise educational standards in schools and colleges. Education committees constantly check and evaluate educational standards and curricula and make recommendations for improvement. The society also seeks to instill professional concepts in engineering students prior to graduation.

(10) It presents many opportunities to contribute personally to the advancement and betterment of the profession. Engineering is one of the fields which place definite social responsibilities on those who enter it. Whether you qualify for the profession by education or by experience, or both, you have already taken an important step, one which should logically be followed by joining your professional society. As a young man, you can contribute enthusiasm and new ideas. As your experience becomes sounder, and richer, you can contribute the benefits of mature judgment. In short, you have already laid an important foundation for personal and social development. Our professional engineering society enables you to build on it.

You Are Not Alone

When you join, you are associating with engineers of 46 other states. And you are joining forces with about 45,000 (Incl. over 1700 LES members) other engineers throughout the country who have seen the necessity and value of a professional organization for all engineers.

Objectives for Professional Engineers

(1) To protect the public and the profession against the unlawful use of the term "engineer" and to promote strict enforcement of the registration law.

(2) To build up public appreciation of the engineering profession.

(3) To promote the appointment of representative, qualified engineers on public committees, boards, and commissions.

(4) To emphasize ethical conduct and proper practice within the profession.

(5) To seek continued improvement in the education of engineers.

(6) To improve and strengthen the civil service structure.

(Continued on Page 24)

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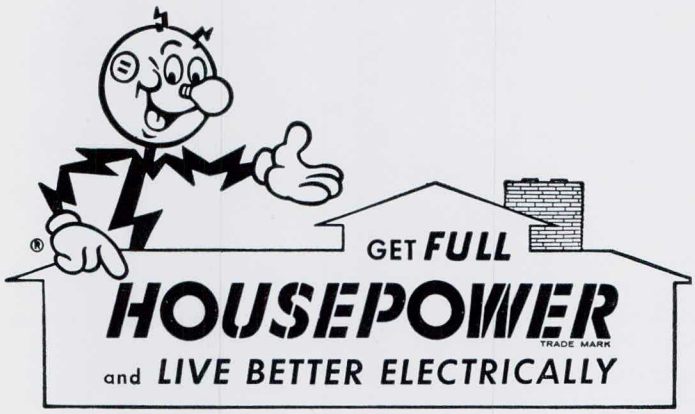

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OBITUARIES

OBITUARY OF COMMANDER HARRY S. SALZER, USCG (Ret.)

Commander Harry S. Salzer died October 9, 1958. He was born in New Orleans August 20, 1896, the son of the late John Salzer and Mary Ann O'Neil Salzer. He was educated in the New Orleans public schools. After graduation from high school he attended Tulane University.

He served in the U. S. Army as a radio specialist from August 15, 1918 until December 7, 1918, during World War I. Immediately following his discharge he accepted a position with the Quartermaster Corps in connection with the construction of the Army Supply Base buildings, now called the New Orleans Army Terminal.

In 1920, he entered the employ of the Board of Commissioners of the Port of New Orleans and in the following year he joined the United States Lighthouse Service where he rose through successive steps to Associate Lighthouse Engineer which assignment he held until consolidation of the Lighthouse Service with the Coast Guard July 1, 1939. In December 1939, he was commissioned Lieutenant in the United States Coast Guard having under his administration the maintenance of not only the fleet of Lighthouse tenders in the district but also the added Coast Guard cutters. On October 2, 1942, he was promoted to Lieutenant Commander and on June 6, 1944 to Commander.

In January 1946, he was transferred from New Orleans to St. Louis, Missouri as Chief of the Civil Engineering Section of the Second Coast Guard District. He retired from the United States Coast Guard at St. Louis, Missouri, on March 1, 1950, and returned to New Orleans.

Commander Salzer was energetic, entering any activity with an enthusiasm which characterized his work in government service. He enjoyed experimentation with electrical apparatus and because of this activity he was instrumental in developing a duplex lantern and control equipment which became widely used in the 8th District.

He was a life member of the Louisiana Engineering Society.

He is survived by his widow, the former Miss Mildred Tucker; three daughters, Mrs. J. H. Denney, Mrs. S. G. Wimberly, Jr., and Mrs. H. H. Powell; two sisters, the Misses Lettie and Jeanette Salzer; three brothers, Jack, Alfred and Ralph Salzer; and eight grandchildren.

His death will be a serious loss to the community and to the many friends he made in the engineering profession.

Be it resolved that this obituary be read at a meeting of the Louisiana Engineering Society, entered into the minutes and published in The Louisiana Engineer, and that copies be sent to members of the family.

CAPT. CHARLES R. MONTEIRO and
W. T. HOGG

OBITUARY OF JOHN E. POTTHARST, SR.

We, of the Louisiana Engineering Society, regret very much to record the passing of our member, John E. Pottharst, Sr., whose death on October 18, 1958, lost to us his most valuable services.

Born April 18, 1892, Mr. Pottharst filled his 66 years of life with full accomplishment. He attended New Orleans public schools and Soulé College. Starting work at an early age, he studied and mastered engineering through correspondence school curriculums.

His first duties were with Fairbanks, Morse and Co. As an engineering salesman, he not only acquitted himself with great credit, but negotiated arrangements with that company to manufacture pumps under the patent rights of A. Baldwin Wood. Through his efforts the Woods pumps were installed in many cities throughout the United States. One of his outstanding installations of these pump equipments was in the engineering details in connection with the drainage of the Miami-Lake Okeechobee area in Florida.

He was one of the pioneers in the public utility business, engineering and building many small engine-powered generating plants in Louisiana and Mississippi.

For 25 years he was President of Peoples Utilities Inc., The Buras Ice Factory, Inc., Delta Power and Gas Co., Inc., all serving the lower Mississippi River area below New Orleans.

As President of the Mechanical Equipment Company, Inc., he engineered and sold many installations of engines, pumps, generator and motor plants for land and marine service. He took out patents and manufactured MECO Thermocompression Sea Water Distilling Units to produce ample potable water from sea water, and at low cost.

He was a Director of The National American Bank, International House and the Missouri Pacific Railroad.

He took an active part in all civic matters.

Mr. Pottharst is survived by his widow, one son, John E. Pottharst, Jr., two daughters and ten grandchildren.

His is a distinct loss to the Engineering Profession, as his many diversified interests always served as an example to the young members of our profession.

JAMES M. TODD
EDWARD A. McLELLAN
ALLEN W. BETZ

OBITUARY OF
RHEA DE ARMOND PERCY

Rhea DeArmond Percy and his wife Sarah Elizabeth Hewes lost their lives in a tragic automobile accident which occurred during a heavy rainstorm when the automobile in which they were riding collided with another vehicle two miles north of Slaughter, Louisiana on State Highway No. 19. They are survived by three sons, Kent, Chaille and Tommy, the oldest of whom Kent, 15, was injured in the accident, and two daughters, Nan and Louisa.

Rhea Percy was a member of one of Louisiana's oldest and most distinguished families. He was born in Clinton, Louisiana on December 13, 1907 the son of the late Mr. Clarence Percy and Mrs. Matilda Percy who survive him. He received his early education at Clinton, Louisiana, and was graduated from Clinton High School in 1925. He attended Louisiana State University from September, 1925 to February, 1929 where he studied Civil Engineering. He also took night courses at Tulane University during the 1931-1932 school year. He was a member of the Kappa Alpha fraternity and of Sigma Tau Sigma, the honorary Civil Engineering fraternity of L.S.U.

He went to work for the Corps of Engineers, U. S. Army, New Orleans District in April, 1929 as a civilian employee and was engaged in the performance of civil engineering work with progressively increasing responsibility in connection with the Mississippi River flood control project until May, 1942 when he resigned to enter military service.

Mr. Percy was directly Commissioned as a Second Lieutenant in the Corps of Engineers on May 23, 1942. He served at Baton Rouge and New Orleans on the construction of military airfields and other installations until January 2, 1944, when he was sent to Europe. While there he served in England, Belgium and Germany in the capacities of Port Engineer and of Engineering Supply Officer. He returned to the United States on November 14, 1945. He was released from active duty March 31, 1946, but was called back into the service in 1947 and served as a base engineer at Barksdale Field for about one year. He then entered the private practice of Civil Engineering, first in partnership with Charles Phillips and later with Phillip Levy, Jr. At the time of his death he was a Lieutenant Colonel in the U. S. Army Reserve Corps.

Mr. Percy was a devout member of St. James Protestant Episcopal Church in Baton Rouge and was very active in church affairs. He had served on the Associate Vestry of the church and was President of the St. James Chapter of the Brotherhood of St. Andrew.

He was a member of the Baton Rouge Kiwanis Club, the United Inventors and Scientists of America, and of the Louisiana Engineering Society. He received his license to practice Civil Engineering in the State of Louisiana on October 16, 1946 on the basis of a written examination.

He was a man of sterling character and was highly regarded in the community where he was known to be a loyal friend, a dutiful son, a kind and affectionate husband and father, and a good citizen as well as a capable engineer.

LEO M. ODOM

"THE WAY TO A GREATER PROFESSION"

(Continued from Page 21)

(7) To encourage engineers, individually and collectively, to participate more actively in civic and public affairs.

(8) To secure a unity of professional thought and action among all classifications of engineers through fusion into one professional engineering organization.

(9) To safeguard the interest of the engineer-in-training and to assist him in his efforts to qualify for registration as a professional engineer.

(10) To secure public recognition for engineers in connection with their works.

(11) To encourage the development of worthy engineering projects and logical public planning.

(12) To restrict the practice of engineering to those competent to practice.

(13) To establish equitable economic standards for engineering services.

(14) To assist student engineers and instill in them a professional conscience.

(15) To initiate, promote and support legislation on behalf of the engineer, and to oppose any legislation tending to injure the interests of the profession.

Origin

The NSPE was formed in September 1934, composed of state societies from Connecticut, New Jersey, New York and Pennsylvania.

The LES was formed in 1898. The society now has six subsections. The current membership is approximately 1,700.

Growth

Today, there are 44 state societies plus Puerto Rico and the District of Columbia, with a membership of approximately 45,000 enrolled in the national society.

Ed. Note: This article is an outline of President Freeman's address before the Lake Charles Section in October, 1958. It is reproduced esentially in outline form because we feel that it can serve as a guide for other talks concerning the society.

COVER CONTEST RULES

1. Drawings should be in ink on approximately 8½" x 11" paper.
2. Design must embody or mention the name of the Louisiana Engineering Society, Engineers Joint Council, National Society of Professional Engineers, and Louisiana State Board of Registration for Professional Engineers.
3. First contest closes on March 15, 1959. Entries received after that date will be judged in subsequent contests.
4. Contests will continue until further notice with an award every two months. Non-winners with merit will automatically be entered in succeeding contests.
5. Suitable prizes will be awarded. The exact prize each time will be determined by the publication board.

FIELD NOTES

This issue of THE LOUISIANA ENGINEER will come as a pleasant surprise to many members of the society. At the Board of Direction Meeting during the Annual Meeting in New Orleans President Sessums made a motion that we increase the size of the magazine. The motion quickly passed and so we have again made a great stride forward.

Because of the necessity for a quick size change after our normal deadline, we have had to do a few things in a way we wouldn't normally handle them. The publisher was most cooperative and we feel that we have put out a fair book but in common language "wait until next time" and the next issue. The editor's job will grow with the magazine and so because of a lack of time I will have to step down as editor as soon as a man with more time can be found. (Anyone interested can contact Mr. Waldemar Nelson.) The Publications Committee, under the leadership of Mr. Waldemar Nelson, has worked long and hard to effect these changes and the society should be very appreciative of their efforts and should give them its support in the coming year.

* * * *

The Southern Pine Association will sponsor its bi-annual Exposition in connection with the 44th annual convention in New Orleans. The Exposition will be on April 11, 12 and 13 and the convention on April 13, 14, and 15, 1959. One of the main features of the exposition will be a "sawmill city" utilizing live outdoor displays in a parking lot adjacent to the Municipal Auditorium. This meeting is of interest to our engineers because there is usually a fresh wave of automation and new equipment installation after each exposition.

* * * *

At the Board of Direction meeting at the Annual Meeting this past month Walter Scales made some excellent remarks concerning professional appearance. Many others had fine comments but one of Mr. Scales suggestions was the daily wearing of the badge of a professional organization. The editor thinks that this is a good idea and would like to add that there are two additional items. The first is the Professional Engineer emblem from the N.S.P.E. for your automobile. This is a handsome emblem that will serve to identify you as a P.E. The other idea comes from some of our stamp enthusiasts. Every year the U. S. Government usually issues commemorative stamps connected with some phase of engineering or technical activity. For instance in June 1959 there will appear a 4¢ St. Lawrence Seaway stamp and in August 1959 a 4¢ Petroleum Industry stamp. Why not make an effort to use these stamps on your mail — the publicity is thus free.

* * * *

This year will mark a major change in the A.S.M.E. Transactions. Starting in January they will be issued in a series of journals entitled "Journal of Engineering for Industry," "Journal of Basic Engineering," "Journal of Engineering for Power," "Journal of Heat Transfer," and the long established "Journal of Applied Mechanics." Members of other societies can contact A.S.M.E. members for exact content of each journal.

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ENGINEERING BRIEFS

Castor Oil for Lubrication — London city buses soon will be using castor oil for lubrication of their rear axles. The idea will save the British capital $336,000 annually. Expectation is that the higher initial cost of the castor oil will be easily absorbed by a two-to-three per cent reduction in fuel consumption due to reduced friction.

—Fleet Owner

* * * *

Air Pillow Drives Elevator — The Czechs claim to have developed the world's first elevator that operates without a cable system. It rides on a pillow of air. Ventilators are used to create a sufficiently strong air beam under the elevator to press the cage upward. When descending, the cabin compresses the air underneath it, insuring a soft downward glide.

—Product Engineering

(Ed. note — Anyone for a hydraulic lift?)

* * * *

Plastic Torpedoes — The U. S. Navy is using fiberglass-reinforced plastics for torpedo launchers and torpedo tubes. Corrosion resistance, high strength and simplified fabrication are the reasons for turning to the new material. Wartime scarcity of non-corrosive metals was also an important incentive.

—Product Engineering

* * * *

MINUTES OF THE MEETING AND BUSINESS OF THE SOCIETY

Minutes of Meeting of the Board of Direction, Engineers Club, New Orleans, November 10, 1958

The meeting was called to order by President Freeman with Messrs. Bogard, Janssen, Nelson, Sutton, Taylor and Fernandez present. Board members McLellan, Sessums and Scales sent their regrets of their inability to attend. Mr. Janssen moved that minutes of the preceding meeting be accepted as forwarded to the board members, seconded by Dr. Taylor and carried.

The secretary read a brief on action taken by the NSPE Board of Directors at its fall meeting held in San Francisco October 23-25, which was attended by President Freeman.

The secretary read expressions of thanks from the families of deceased members H. M. Landry, John E. Pottharst and Charles J. Wyler. President Freeman appointed Messrs. James M. Todd, Chairman, E. A. McLellan and Allen W. Betz to prepare the obituary of the late Mr. Pottharst.

In accordance with the society's rules Mr. Camiel Hoctel Jr. dropped from the rolls upon motion by Dean Bogard seconded by Mr. Nelson.

There followed a discussion on the society's publication in which President Freeman made numerous recommendations for the next administration.

Dean Bogard moved that the regular December meeting be held on Monday, December 1 instead of the 8th, seconded by Mr. Janssen and carried.

Mr. Nelson moved that monthly notices of meetings held in New Orleans be mailed to all members residing in the New Orleans area and to officers of all state sections only, and that minutes of board meetings be mailed to the officers of state sections. Motion seconded by Mr. Sutton and carried.

Discussion followed on the preparation of the booklet "Key to a Greater Profession", after which Mr. Janssen moved that the secretary be authorized to prepare material for inclusion in the booklet and to purchase 4,000 copies from NSPE.

Board members were urged to submit their recommendations for nominees for 1959 officers. It was agreed that a Public Relations Committee should be selected at the next meeting and that board members should give careful consideration to the matter.

In accordance with the system inaugurated this year, board member sponsors of standing committees were requested to submit their recommendations for 1959 standing committee personnel at the next meeting. There being no further business the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Regular Meeting held jointly with the New Orleans Section, American Institute of Chemical Engineers, Engineers' Club November 10, 1958

The meeting was called to order by President Freeman with approximately 125 members and guests in attendance. The president welcomed the American Institute of Chemical Engineers and guests, after which the secretary read minutes of the society meeting and the board meeting held in October.

President Freeman announced the personnel of the Nominating Committee and urged all members to submit their recommendations for the society's 1959 officers. He also announced that the regular December meeting would be held on Monday, December first instead of on the usual second Monday of the month.

The chair then was relinquished to Mr. O. W. Weidemann, Chairman, New Orleans Section, A.I.Ch.E., who called on Dr. Raymond Bailey to introduce the speaker of the evening. There followed a most informative, illustrated talk on "Nuclear Reactors Under Development" by Dr. Paul R. Kasten of Union Carbide Nuclear Company, Reactor Experimental Engineering Division at Oakridge National Laboratory.

The chair then was returned to President Freeman and the meeting adjourned with a rising vote of thanks to the speaker.

JOHN P. FERNANDEZ, Secretary-Treasurer

BATON ROUGE SECTION

December 9, 1958, Union Tank Car Shop

A tour of the new Union Tank Car Shop north of Baton Rouge was made. This unique structure; a geodesic dome, has been hailed by architects world-wide as a major advance in building design. Color slides of the construction of the shop were also shown. Approximately eighty persons attended. Refreshments were served following the meeting.

BATON ROUGE SECTION

November 19, 1958, Gulf States Utilities Auditorium

Mr. E. E. McElveene, Assistant Manager of Engineering of the Okonite Company of Passaic, New Jersey, spoke on "Cable Testing and its Significance." His lecture was accompanied by a demonstration of testing equipment and illustrated with color slides. This was a joint meeting with the American Institute of Electrical Engineers. Approximately fifty persons attended. Refreshments were served following the meeting.

LAFAYETTE SECTION

Minutes, Regular Meeting October, 1958

The regular meeting for the month of October, was held at the Blair House on the 20th at 7:30 p.m. A total of 46 persons were present.

President Domingue welcomed members and guests. It was moved and seconded that the reading of the minutes of the last meeting be dispensed with.

President Domingue announced the appointment of the following committee for the year:

Program Committee: Mr. T. J. Borgman—Chairman; Mr. Allen Bonnet, Mr. Jules G. Patout

Entertainment Committee: Mr. W. C. Vincent—Chairman; Mr. Alfred Schoeffler, Mr. Jimmie Neef

Membership Committee: Mr. J. E. Reed, Jr.—Chairman; Mr. George Arnett, Mr. Magee J. Moss, Mr. L. C. Landry, Mr. Alex. F. Watkins, Mr. Hampton Primeaux, S.L.I. Student Chapter Representative

Civic Affairs Committee: Mr. Bob Hetherwick—Chairman, Mr. W. E. Robert, Mr. Harry L. Dula, Mr. Thurman L. Morgan, Mr. A. M. Bujard, Mr. Donald O'Rourke, Mr. Russell Caffery, Mr. Allen Bonnet

Publicity Committee: Mr. Donald O'Rourke, Mr. R. E. Jenkins

N. S. P. E. Reporter: Mr. J. R. Troxler

A brief report was given by President Domingue on the important issues discussed at the State Board meetings which he attended since our last regular meeting in May.

A brief discussion was held concerning the meeting dates and preferable meeting places for the coming year. It was decided that regular monthly meetings were to be held on the third Monday of each month except when such date conflicted with obtaining a guest speaker.

It was announced that the next meeting date would be Wednesday, Nov. 12, since the guest speaker scheduled for the meeting was available only at that time.

President Domingue called on Mr. T. J. Borgman, Program Committee chairman, to discuss briefly the plans for the programs for the year and to introduce the guest speaker. Mr. Borgman introduced Mr. Horace B. Rickey, Jr., chairman, Highway Traffic and Parking Committee, Chamber of Commerce, the guest speaker, and Mr. Kenny Bowen, Executive Vice President, Chamber of Commerce, who was a guest.

Mr. Rickey gave a most interesting presentation on the recommendations made by the Highway Traffic & Parking Committee, to the city of Lafayette and Parish officials regarding proposed major highways through the city of Lafayette and major arterial streets within the city. Mr. Rickey pointed out that one of the functions of his committee was to plan and make recommendations for efficient movement of traffic within the city of Lafayette and it was only by careful planning that this could be accomplished. A discussion followed Mr. Rickey's remarks.

There being no further business, the meeting was adjourned.

G. R. DYSON, Secretary-Treasurer

MONROE SECTION

October 9, 1958

The Monroe Chapter of the Louisiana Engineering Society met at Louisiana Tech in Ruston, Louisiana on October 7, 1958. Coffee and sandwiches were served prior to the meeting. No business was conducted at this meeting.

Mr. R. H. Manning, of the Webster Parish School Board, was our speaker for the evening. He gave a talk on Space Travel, which was very interesting.

Dean Bogard moved that the December meeting be a dinner meeting allowing wives to attend. It was seconded and passed.

Mr. Adams announced that he has secured a film on the construction of the Mackinac Bridge, which will be used in connection with the engineering meeting.

DAN D. McDUFF, Secretary-Treasurer

SHREVEPORT SECTION

December 2, 1958

A business meeting of the Shreveport Section of the Louisiana Engineering Society was held at the Seven Seas Restaurant at 12:30 p.m., December 2, 1958 with 33 members present.

President John S. Malahy presided and submitted a report from Mr. Carl M. Hadra of the Nominating Committee which was appointed by the President at our November meeting.

The Nominating Committee recommended the following Officers for the year 1959:

President Quentin W. Hargrove, 732 Robinson Place, Shreveport, La.

First Vice President: Robin M. Hodd, 633 McCormick St., Shreveport, La.

Second Vice President: O. T. Ice, Jr., 522 Egan St., Shreveport 12, La.

Secretary-Treasurer: Thomas F. Ruffin, P.O. Box No. 571, Shreveport, La.

A motion was made by Ernest M. Gillen that the report be accepted. This was properly seconded and the 1959 officers elected by acclamation.

A motion was made by Rhett S. Parker that our section contribute $100.00 per year through our Ladies Auxiliary for establishing another Engineering Scholarship to La. Tech at Ruston, La. This motion was seconded by Carlton C. Salley and carried unanimously.

President Malahy announced that plans were being completed for a Social Meeting with the Ladies Auxiliary on December 27, 1958 and that members would receive full details later.

The meeting adjourned at 1:00 p.m.

O. T. ICE, JR., Secretary-Treasurer

MONROE SECTION

December, 1958

The meeting was held at the Hollywood Restaurant (new annex), in Monroe, Louisiana, on Tuesday, December 9, and began at 7:30 p.m.

Farrell Adams, President of the Monroe section, presided at the meeting and opened by having each member introduce himeslf and his guest.

The president appointed Stanton Huey, Jr., as acting secretary in place of the regular secretary who was absent.

Mr. Ross read the minutes of the previous meeting.

Next came old business at which time the president made the following announcements: The Louisiana Engineering Society will meet with the A.S.M.E. and the A.I.E.F. during the next year, at which time a film of the Macinac Straits Bridge construction will be shown. The state is trying to have a tour speaker during the coming year.

The next item of business was committee reports. The president read the following report handed in by Dan McDuff, Secretary-Treasurer:

New Members	8
Members Lost by Death	1
Members Transferred to Other Sections	4
Members Dropped from Roll	6
Loss in Membership This Year	3
Total Membership is Now	99

FINANCES FOR 1958

January 1, 1958, on Deposit	$263.43
Collected From Dues	456.25
Cash on Deposit This Date	213.81

The president gave a short report on each of the other committees.

The Society will award the following medals this year: The Louisiana Engineering Society Activities Medal, the Andrew M. Lockett Award, and the Louisiana Engineering Society Technological Accomplishment Medal.

During the past year the Louisiana Engineering Society approved Louisiana Tech as a graduate engineering school and approved the upgrading of requirements for mathematics and science as a requirement for graduation from high school.

The following members were installed as officers in the Louisiana Engineering Society for the coming year: Mr. Thigpen, President; Mr. Brownlee, First Vice-President; Mr. Brooks, who was absent, Second Vice-President, and Mr. Henry, Secretary and Treasurer.

The President announced that the annual conference of the Louisiana Engineering Society would be held on December 15, 16, and 17.

The meeting adjourned.

STANTON HUEY, JR., Acting Secretary

NEW MEMBERS

Alexander Allison, Jr., New Orleans; James S. Boyd, Shreveport; Anthony J. Calandro, Baton Rouge; Alvin S. Caplan, New Orleans; Donald D. Cherry, New Orleans; Jules B. Daigle, New Orleans; Adam W. dePerrodil, Lake Charles; Ernest L. Eustis, Sr., New Orleans; Robert A. Fenstermaker, Oakdale; Col. Philip S. Finn, Jr., New Orleans; Lionel E. Flotte, Jr., New Orleans; Leo Freeman, Baton Rouge; William S. Huey, New Orleans; Robert Jachim, Port Allen; Ferdinand P. Joseph, Glenmore; Louis Clyde LeBlanc, Houma; Eugene F. Mayo, New Orleans; John P. McNamara, New Orleans; Forrest W. Merrill, Lake Charles; Paul G. Merritt, New Orleans; Willie H. Morgan, New Orleans; Edward R. Morphy, New Orleans; Leland V. Page, Baton Rouge; Burt McC. Payne, Baton Rouge; Thomas J. Regan, Jr., New Orleans; Henry C. Reinberg, Baton Rouge; Horace B. Rickey, Jr., Lafayette, La.; Robert S. Vincent, Lake Charles.

TRANSFER FROM JUNIOR MEMBER

Charles P. Barnard, Baton Rouge; William F. King, New Orleans; Emeterio I. Ramirez, Puerto Rico; James V. Reuter, Jr., New Orleans; Pierre J. Stouse, Jr., New Orleans; Christian M. Voelkel, Jr., New Orleans; Clarence A. Wethern, Jr., New Orleans; John D. Wink, Jr., Monroe.

AFFILIATE MEMBER

Benjamin S. Jenkins, New Orleans; Charles Robert Pratt, Lake Charles.

TRANSFER FROM JUNIOR TO AFFILIATE

Dennis E. Mitchell, Jr., Alexandria.

INDEX TO ADVERTISERS

Gulf Engineering Company, Inc. ..... Inside Front Cover

American Creosote Works, Inc. ..... Inside Front Cover

Bedell & Nelson ..... Page 20

Central Louisiana Electric Co. ..... Page 20

Southern Bell Telephone Co. ..... Page 18

W. S. Dickey Clay Mfg. Co. ..... Page 10

New Orleans Blue Print & Supply Co. ..... Page 21

Gulf States Utilities Co. ..... Page 22

Yarberry's ..... Page 22

Professional Listing ..... Page 16

Southern States Equipment Co., Inc. ..... Page 22

Dietzgen ..... Page 25

Louisiana Power & Light Co. ..... Page 9

Franklin Printing Co., Inc. ..... Inside Back Cover

A. M. Lockett & Co., Ltd. ..... Inside Back Cover

Betz Engineering Sales Co. ..... Back Cover

W. Horaec Williams Co. ..... Back Cover

JUNIOR MEMBER

William A. Baker, Jr., New Orleans; Jerry Blackburn, Minden; John F. Leffers, Kenner; Merritt E. McDonald, Baton Rouge; Richard M. Primeaux, Lake Charles; David P. Taylor, Jr., Farmington, New Mexico; Ronald J. Toomer, Baton Rouge.

JUNIOR MEMBERSHIP AWARDS

Rodolfo J. Aguilar, Baton Rouge, Graduate LSU, B.S. Arch. Eng.; Albert M. Auster, New Orleans, Graduate Tulane Univ., B.S.Ch.E.; James M. Free, Archibald, La., Graduate LSU, B.S.M.E.; Gerard P. Jesclard, New Orleans, Tulane Univ., B.S. E.E.; James E. Johnston, Maplewood, Graduate La. Polytechnic Inst., B.S.ChemE.; Maurice W. McKinney, Jr., Delhi, Graduate La. Polytechnic Inst., B.S.Geol.E.; Sunny Tsai, New Orleans, Graduate Tulane Univ., B.S.E.E.



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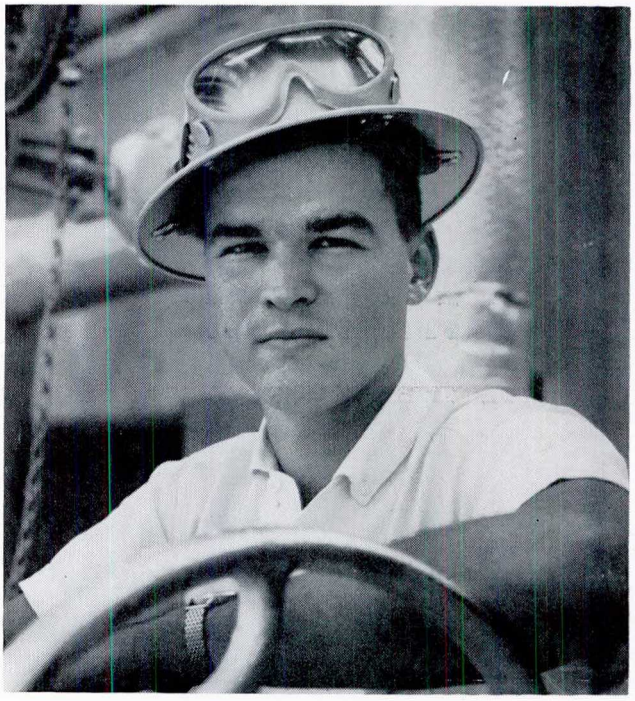

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THE LOUISIANA ENGINEER

Vol. 45 **April, 1959** **No. 2**

CONTENTS

	Page
AEC CHAIRMAN GIVES VIEWS TO LA. ENGINEER	5
PETROCHEMICAL GIANT	6
NSPE NEWS	7
EJC NEWS	7
E. I. T. EXAMINATIONS	8
DULLES COMPARES SOVIET ENGINEERS	9
LA. REGISTRATION GROWTH	10
PROFESSIONAL ENGINEERS GRANTED REGISTRATION	10
STATE BOARD REPORTS	11
THE SHREVEPORT ENGINEER LOOKS AT HIS AREA	12
STANDING COMMITTEES	14
DISSOLVED GAS CONTENT OF MISSISSIPPI RIVER	16
MINUTES AND BUSINESS	19
MEMORIALS	21

Chester A. Peyronnin, Jr. ..... ***Editor***

Warren K. Bankston ..... ***Business Manager***

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The Louisiana Engineering Society does not guarantee the accuracy of statements made or necessarily concur with opinions expressed in this publication.

OUR COVER: *Louisiana's youthful and sturdy petrochemical industry is personified in the face of the young engineer employed in the butadiene plant of Petroleum Chemicals, Inc. at Lake Charles. See related article on Page 6. This new cover is the joint effort of the Design Department of Bedell and Nelson Engineers, Inc., consulting engineers.*

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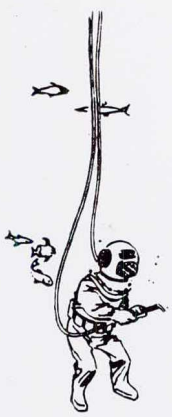
We feel that you, as a reader of The Louisiana Engineer, are entitled to a measure of service beyond the mere presentation of engineering articles and news.

The service we refer to has to do with the individuals and companies who advertise in this publication.

So that you, a busy engineer, may be relieved of the necessity of performing your own investigations, the Louisiana Engineering Society is assuming part of this responsibility for you by accepting advertising only from proven reliable companies. By this, we do not intend to infer that these are the only reliable ones, but we do point out the fact that, from our knowledge of past performance, you may, in our best judgment do business with our advertisers with complete confidence.



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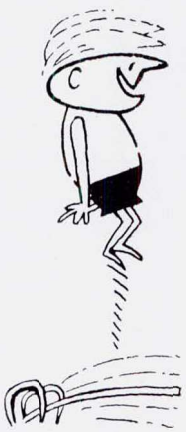

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Power From Thermonuclear Fusion
McCone Sees It As A Reality

Power from thermonuclear fusion is not a dream but an approaching reality, John A. McCone, chairman of the U. S. Atomic Energy Commission, told The Louisiana Engineer.



JOHN A. McCONE
. . . *"engineer's role vital"*

Mr. McCone spoke at the 27th annual convention of the Edison Electric Institute in New Orleans on April 7. The meeting was attended by top utility officials and a number of Louisiana engineers.

How prophetic his remarks were borne out even as he was addressing the convention. News stories from Los Alamos announced that atomic engineers had successfully lighted a bulb powered by atomic energy by means of a thermocouple which completely by-passed conventional turbine generation processes.

However, immediately after his speech, Mr. McCone and leaders of General Electric, Westinghouse and other groups pointed out that the experiment conducted at Los Alamos was but a step in the right direction. The pioneer activity at Los Alamos, Mr. McCone pointed out, did not mean atomic energy would replace conventional turbine generation in the foreseeable future. This view was emphasized by other industrial leaders who said that the significant aspect was that the thermocouple developed at Los Alamos was the most efficient yet developed, but that it was a long way from lighting a single light bulb to generating hundreds of thousands of kilowatts of power for utility use throughout the nation.

Cites Engineer Role

Mr. McCone said the role of the engineer in our nation's atomic power program is vital toward its success.

"You must help with your technical knowledge, for your technical and engineering resources are vast."

He cited the challenge facing the nation. "This challenge must be met by you and me—by all of the power industry, both public and private, and the Federal government as well."

Mr. McCone said in his opinion we lead the world in atomic technology because we know more about "this difficult and and at times forbidding science than do men of other nations. In saying this I admit that at least one other country and possibly two, are producing more kilowatts of electricity from the atom than we are. Moreover, this situation will continue for some time.

"The question is often asked, why this is? Are we slipping? My answer is, no. Kilowatts at high cost are not important to us. We have the lowest cost power of any principal nation in the world. Moreover, we have abundant supplies of conventional fuel. What is important then is to advance "know-how"—to be there first with the cheapest and most dependable atomic power. This calls for steady, rapid development. It does not call for large quantities of kilowatts."

Competitive Power Possible

He said he believed that competitive nuclear power is possible and that some day nuclear power will support our ever-expanding industrial growth.

He said he had not been swept along by the unwarranted enthusiasm of the early 1950's. Likewise, he was not persuaded by the gloom and despair so frequently expressed today.

"I am convinced from long, hard study of this problem that atomic power will be competitive and therefore useful in the United States at an earlier date.

"I am further persuaded that the need for this source of power is such that we must promptly overcome the technical problems. The Government in our national interests must see that this is done. The electrical industry, both public and private, in the interest of meet-their ever-growing demands, must also work with unrelenting effort towards the perfection of these processes. When this task has been accomplished, the atom will provide an increasing proportion of the growing demand for electrical energy."

Broad Agreement

Mr. McCone said there is now broad agreement on the following objectives and these represent national policy:

1. To reduce the cost of nuclear power to competitive levels in high energy cost areas of this country in ten years.
2. To assist friendly nations now having high energy costs to achieve competitive levels in about five years.
3. To support a continuing long-range program to further reduce the cost of nuclear power.
4. To maintain the United States position of leadership in the technology of nuclear power for civilian use.
5. To develop breeder type reactors to make full use of the nuclear energy latent in both uranium and thorium.

He said as an example of what had already been accomplished, seven experimental power reactor plants are now in operation. He said they are performing well and are contributing valuable, first-hand operating information. By and large, they are performing better than the scientists and engineers expected.

As one example, he cited the experimental boiling water reactor at Argonne, a simple plant designed to produce 20 megawatts of heat.

He said the plant has vastly exceeded its design capability.

(See McCone, Page 18)

Louisiana's Lusty Giant
Petrochemicals on the March

What it takes, Louisiana has, and the chemical industry, mostly petrochemical, has invaded Louisiana, Bruce K. Brown, president of Petroleum Chemicals, Inc., told the Louisiana Engineering Society at a meeting in New Orleans on January 16.



BRUCE K. BROWN
. . . "growing and growing"

Ample raw materials, valuable processing water supplies, and availability of bulk transportation are the magnets which drew it to our state, he said.

And better yet, the future promises further expansion, Mr. Brown pointed out.

A comparative infant, the chemical and petrochemical industries were vastly stimulated by necessities of World War II. Enormous quantities of explosive were required and were made from petroleum bases. Because of the submarine blockade, synthetic rubber became a necessity and a whole new industry sprang into being to supply the demand for rubber. Both of the principal components of synthetic rubber—butadiene and styrene—are produced petrochemically, he explained.

Three Major Areas

The petrochemical industry in Louisiana is presently concentrated in three major areas. One is the New Orleans-Baton Rouge center and along the Mississippi River, and a second is in the Lake Charles area. A third location, relatively smaller but still significant, is the Sterlington-Monroe area.

In the New Orleans-Baton Rouge area some of the most famed names in the industry are represented. They include American Cyanamid, Monsanto, Dow Chemical, Wyandotte Chemicals, Ethyl, Esso Standard, Foster Grant, Shell Chemical and W. R. Grace.

Located in the Lake Charles area are such names as PCI, Olin Mathieson, Columbia-Southern, Davison Chemical, Grace, Firestone and Lake Charles Chemical.

Mr. Brown said that throughout the entire industry, more than 3000 petrochemicals are manufactured, and through continued research on the part of all members of the industry, some 400 new chemicals are being introduced each year.

On the subject of growth, statistics from the Manufacturing Chemists' Association show that Louisiana ranks second to Texas in chemical construction, planned and completed during 1957-59. However, he explained that construction completed in 1958 indicates a greater investment in Louisiana than in Texas—$396,350,000 for our state as compared to $354,330,000 in Texas.

10,500 Employed

Because of the difficulty of definition, he said it is hard to set forth precise figures measuring the petrochemical industry in Louisiana. But by confining himself strictly to industries which classify themselves as chemical manufacturers, he said the industry employs more than 10,500 people in the state. Of these 6000 are high school graduates and 1600 are college graduates. More than 70 per cent of these persons were born in Louisiana and they live in 34 out of 67 parishes. Plant's payrolls are of the order of $75 million annually and more than $1/4 billion has been invested in new manufacturing facilities since 1952.

One of the factors that attracted the industry to Louisiana—fuel—is abundant in the state. Natural gas and petroleum are produced in major quantities and the state ranks high on the national list as a producer.

State Richly Endowed

Louisiana is also richly endowed with another factor that attracted the industry. This is water for processing and cooling purposes. The Mississippi River alone brings more water by the doorsteps of Baton Rouge and New

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A part of the petrochemical activity in the Lake Charles area is shown in the butylene purification towers of the butadiene plant of Petroleum Chemicals, Inc.

Orleans each day than the entire nation uses for all purposes, including irrigation. In addition, all of Louisiana's other major cities are on rivers of varying size—Lake Charles on the Calcasieu River, Shreveport and Alexandria on the Red River and Monroe on the Ouachita.

Mr. Brown said the last industrial requisite—bulk transportation availability—is readily met by the presence of the Mississippi River, the Intracoastal Canal and the Calcasieu River.

EJC Meeting Highlights

Highlights of the EJC annual board meeting on Jan. 6 in New York included a seven-point recommendation for strengthening and implementing the work of EJC; a proposal approved by the Council for the steps to be taken toward eventual merging of EJC, ECPD and EMC under one corporation, with each division maintaining its own identity; a citation presented by EJC to the Westinghouse foundation in recognition of its scholarship program with the Carnegie Institute of Techonology; a luncheon address to the Council, Dr. Robert B. Brode, Association Director of the National Science Foundation, on the policies of NSF toward engineering.

EJC Membership

EJC welcomed the Consulting Engineers Council, a national federation of state bodies of consulting engineers into the Council as an affiliate member at the November meeting. At the annual meeting an official announcement of the merging of the American Society of Refrigerating Engineers into the American Society of Heat, Refrigerating and Air Conditioning Engineers was made. The result of the two actions brings EJC membership to 20 societies.

Self-Employed Retirement

The Keogh-Simpson bill, formerly the Jenkins-Keogh bill, in Congress (H. R. 10 and H. R. 9) would permit a self-employed person to defer income tax each year on a portion of his own income to provide for his retirement. This part of income would be paid in voluntarily to a restricted retirement fund or as premiums on an increase policy with retirement features.

Engineers in Construction

The Kennedy-Ervin bill (S. 505), providing for U. S. labor reforms, has included in it several general amendments to the Taft-Hartley Act, one of which, dealing with the construction industry, could prove seriously detrimental to the separate election rights currently granted professional employees by Section 9 (b) (1) of the act. According to S. 505, employers and unions in the construction industry could sign collective bargaining agreements without secret ballot to select a collective bargaining representative. Such agreements could require union membership of all employees covered by the agreement, including professioned. There appears no doubt but that, according to this provision, professional employees could be represented by and forced to join a heterogeneous labor union without the separate election currently afforded them by Section 9 (b) (1) of the Taft-Hartley Act.

Aid For College Facilities

In a special letter to Vice President Nixon, Health, Education and Welfare Secretary Arthur S. Flemming recommended legislation to enable colleges and universities to finance the construction of needed educational facilities, such as classrooms, laboratories, libraries and related facilities for research or instruction.

Tax Revision Bill

A proposal which could prove highly beneficial to employed engineers has been introduced by Rep. Hale Boggs of Louisiana. This bill, H. R. 37, would amend the Internal Revenue Code to provide that moving expenses paid by an employer for a new employee shall not be included in the gross income of the employee.

E. I. T. Examinations To Be Offered In Louisiana

By JESSE COATES, Secretary
Louisiana State Board of Registration
for Professional Engineers
Department of Chemical Engineering
Louisiana State University

The Louisiana State Board of Registration for Professional Engineers and Land Surveyors proposes to offer to seniors in engineering, and other interested people, the opportunity to take the uniform Engineer-in-Training examination in connection with their application for registration as Professional Engineers. It should be understood tht this examination is not a requirement for registration in Louisiana. This examination is being offered as a service to applicants for registration in Louisiana and is being given simultaneously by most State Boards of Engineering Examiners. Although Louisiana, at the present time, does not require an examination for registration, it is realized that many graduates of our State universities will be employed in states other than Louisiana and that many of these states do require such an examination. The results of the Louisiana examination will be recognized by State Boards which have such a requirement.

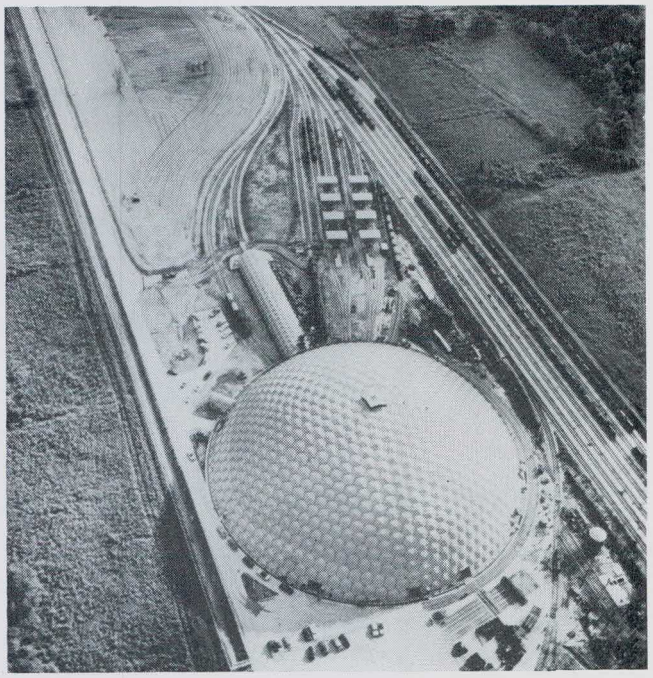
The date for this examination has been set as Saturday, May 2, 1959. It will be given in two parts. Part A will cover fundamental subjects, such as mathematics, chemistry, electricity, economics and physics and will be given from 8:00 A.M. to 12.00 M in the morning. Part B will cover kinetics and mechanisms, statics, thermodynamics, hydraulics, and strength of materials, and will be given from 1:00 P.M. to 5:00 P.M. Several problems on each subject will be offered and the applicant will select problems from each group. Steam tables, physical constants, and paper will be furnished by the Board.

The examination in Louisiana will be given at Louisiana State University, Southwestern Louisiana Institute, Louisiana Polytechnic Institute, and Tulane University. The examination will be administered by Dr. Jesse Coates, Head of the Department of Chemical Engineering at L.S.U., Dean F. W. zur Burg, College of Engineering at S.L.I., Dean B. T. Bogard, College of Engineering, Louisiana Tech, and Dr. F. W. Macdonald, Civil Engineering Department, Tulane University.

Those who desire to take the examination will be required to pay a fee of $5.00 at the time of examination or else submit an application for registration as a Professional Engineer in Louisiana accompanied by the full registration fee of $25.00. Those who do not apply for registration at the time of examination will receive a credit of $5.00, applicable toward the registration fee of $25.00 should they apply at a later date.

—o—

Construction of a new terminal and warehouses facility on Bayou Boeuf near Morgan City has been completed by Shell Oil Co. to serve coastal and offshore drilling rigs. Offices, pipe storage yards, a change house for employees and a heliport are among the new facilities.



The world's largest known circular building without internal support is shown in this aerial view of the Union Dome at Baton Rouge. It serves as a center for tank car repair and maintenance operations for Union Tank Car Co. The dome weighs 567 tons, but because of its self-supporting features, places no more weight on its foundation at any one point than does the wheel of an automobile on the ground.

PERSONAL NOTES

Beginning with the next issue of the Louisiana Engineer, a column will be devoted to the personal and social activities of the engineers of Louisiana and their families. Material for this column will be obtained by direct correspondence from engineers throughout the state. Items should be brief, names used should be double-checked for accuracy, and all material should be addressed to Allen Johnson and Associates, 921 Carondelet Building, New Orleans 12, La. Photographs may also be submitted if they are fully identified and the purpose for which the photograph is intended is fully explained. Only gossy photos which readily lend themselves to good reproduction should be sent.

Plans for a new multi-million dollar aggregate plant near Port Allen have been announced by a Baton Rouge real estate developer. Aggregate from special clays will be produced at the plant on a 100-acre site.

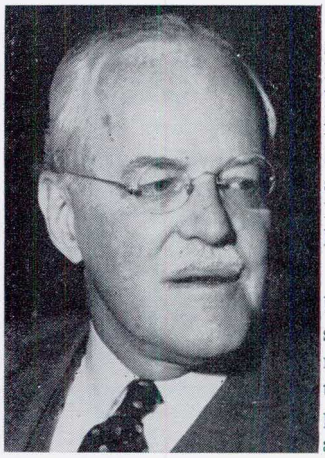
* * * *

Liquefied natural gas, for the first time in history, is now being shipped across the Atlantic. The "Methane Pioneer," a 5000-ton dry cargo ship especially converted, began carrying shipments of 32,000 barrels of liquefield methane from Lake Charles to England.

Dulles Warns of Soviet Penetration

Engineers In Red Bloc

The Soviets are actively using the engineer in nations of the free world to achieve their aims, Allen W. Dulles, director of Central Intelligence, told The Louisiana Engineer after he was heard by executives of private utility companies and some Louisiana Engineers in an address before the Edison Electric Institute in New Orleans on April 8.



ALLEN W. DULLES
. . . *"Soviets use the engineer"*

He said over 4000 Soviet bloc technicians have been sent to assist the development of nations not under the Russian yoke. About 70 per cent of these technicians are engaged in economic activities. Others are reorganizing local military establishments and teaching bloc military specialists have now received such training behind the Iron Curtain.

In our own hemisphere he cited the recent disclosures of Soviet plotting in Mexico.

Expanding on his formal address, Mr. Dulles said in a news conference that the Soviets are challenging the U. S. by attempting massive economic penetration in Bolivia's tin, Chile's copper and Malaya's tin.

Use Dumping Method

He said the economic strategy of the Russians in such instances was a dumping method whereby national economies would be disrupted, thus favoring Communist opportunism.

The challenge of Soviet power represents a triple threat of first, military; second, economic; and third, subversive, he said.

"This challenge is a global one.

"As long as the principles of international Communism motivate the regimes in Moscow and Peping, we must expect that their single purpose will be the liquidation of our form of free society and the emergence of a Sovietized, communized world order."

Mr. Dulles said they change their techniques as circumstances dictate. They have never given us the slightest reason to hope that they are abandoning their overall objective, he pointed out.

"We sometimes like to delude ourselves into thinking that we are faced with another nationalistic power struggle of which the world has seen so many. The fact is that the aims of the Communist international with its headquarters in Moscow are not nationalistic; their objectives are not limited. They firmly believe, and eloquently preach, that Communism is the system which will eventually rule the world and each move they make is directed to this end."

The Military Phase

On the military phase of the Soviet threat, he said he wanted to dispel any possible misinterpretations.

"First, I do not believe that the Soviets now have military superiority over us; and second, I do not believe that they desire deliberately to provoke hostilities with the U. S. or the Western world at this time. They are well aware of our deterrent force. They probably believe that the risks to them even if they resorted to surprise attack would be unacceptable."

Of our own military strength, Mr. Dulles said that he considered our military posture as stronger and our ability to inflict damage as greater than that of the Russians.

Returning to the economic phase of the Soviet threat, he said that he is convinced that the final victory of Communism could be achieved mainly by non-military means.

He pointed out that the Soviet industrialization continues to grow.

Contrast in Emphasis

As an example he said that while the Soviets last year were producing only one automobile for every 50 we produced, they were turning out four machine tools to our one. This contrast in emphasis carries through in many other fields, he explained.

The defense of our nation does not lie in compromise, but in understanding and firmness and a strong and ready deterrent military power. We must also marshall our economic assets with those of the other free countries of the world to meet their methods of economic penetration, and finally in the unmasking of their subversive techniques, Mr. Dulles said.

"The over-all power of the free world is still vastly superior to that under the control of the leaders of international communism. If they succeed and we fail, it will only be because of our complacency and because they have devoted a far greater share of their power, skill and resources to our destruction than we have been willing to dedicate to our own preservation."

———o———

The longest submarine pipeline in the world is a 55-mile system which extends from southwestern Louisiana out under the Gulf of Mexico.

* * * *

The "United States," the world's largest and most powerful tugboat, is now in operation between New Orleans and St. Louis.

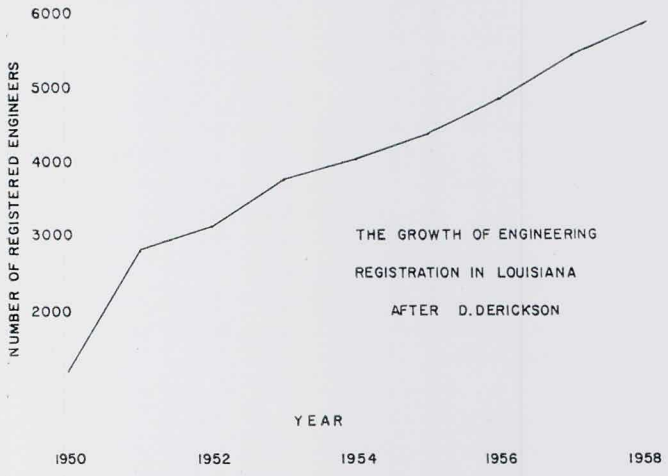
* * * *

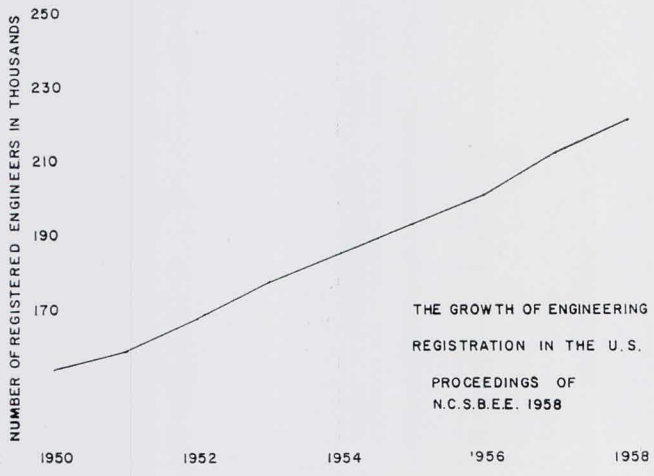
An $828,000 expansion to the Ingram Products Co. is now under construction at the company's refinery at Meraux, south of New Orleans.

Louisiana Registration Growth

The attached curves indicate the growth of registration in Louisiana and in the United States. Act 73 of 1950 did not become fully effective until 1951 in Louisiana. If we calculate the increase in registration then between the years 1951 and 1958, we will find that Louisiana shows an increase of 106% in 1958 over the registration of 1951 and for the same period the national growth rate was only 38%. One of the factors accounting for the rapid increase in registration in Louisiana is undoubtedly that of the rapid industrialization of the state.

In 1951 Louisiana was 22nd among the states and territories in the number of registrants. By 1958, Louisiana had claimed to 12th place. With the exception of Texas, Louisiana has the largest number of registrants of any state in the south.





Professional Engineers Granted Registration On February 17, 1959

Adams, James Walter	125 Fairway Dr., New Orleans, La.	Civil
Allen, Philip Leland	1737 Irving Place, Shreveport, La.	Civil
Bateman, Donald Joel	1960 Martin St., Baton Rouge, La.	Mech.
Bitar, Edward	503 Boyd Ave., Baton Rouge, La.	Elec.
Bourgeois, Harold S., Jr.	4845 Floynell Dr., Baton Rouge, La.	Chem.
Brock, Oscar Knight, Jr.	265½ Elmwood, Shreveport, La.	Elec.
Buck, David Gillespie	Apt. C., 834 Royal St., New Orleans, La.	Civil
Busby, Wesley Leonard	8210 Oleander, New Orleans 18, La.	Civil
Carazo, Julian J.	5690 Jackson Ave., Baton Rouge 6, La.	Civil
Carson, Jerry D.	4769 Overton Dr., New Orleans, La.	Mech.
Chiang, Chai-Sung	405 Shrewsbury Ct., New Orleans 21, La.	Mech.
Clary, Ben Joseph	Box 485, Bernice, La.	Elec.
Cosgrove, Earl Conway	Box 12548, L. S. U., Baton Rouge, La.	Mech.
Crawford, Richard Earl	Rt. 1, Calhoun, La.	Civil
Cunningham, Dean Arthur	420 Richardson, Minden, La.	Mech.
Evans, James T.	919 Jefferson Pl., Shreveport, La.	Civil
Fontenot, Ronald Clayton	Rt. 1, Box 300, Eunice, La.	Chem.
Fordham, Donald Gene	Rt. 1, Box 129, West Monroe, La.	Elec.
Furnish, Oren Carl, Jr.	714 Apple St., Norco, La.	Mech.
Giffen, Harvey Douglas	138 Moss Lane, New Orleans 23, La.	Mech.
Gilliland, Bobby Eugene	Box 308, Rayville, La.	Chem.
Harris, Frederick Arthur	2621 Talbot, Houston 5, Tex.	Civil
Haveman, O. H., Jr.	P. O. Box 68, Venice, La.	Petr.
Hirsch, Marcus Milton	10544 Kenlee Dr., Baton Rouge, La.	Mech.
Holle, Lt. Kendrick	2540 Massachusetts Ave., NW, Washington, D. C.	Civil
James, Thomas Dawson	914 North Vienna St., Ruston, La.	Mech.
Johnson, David L.	1610 Valley St., Ruston, La.	Elec.
Kerr, Raymond A.	6312 Rutgers St., Houston 5, Tex.	Petr.

(Continued on Page 15)

REPORT OF BOARD FOR 1958

The Louisiana State Board of Registration for Professional Engineers and Land Surveyors was created by Act 73 of the Legislature of the State of Louisiana at the regular session of 1950. The Act delegates to the Board the duty of registering qualified persons as Professional Engineers and Land Surveyors, and charges the Board with the responsibility of enforcing the provisions concerning violations. Act 73 of 1950 also repealed Act 308 of 1908, as amended, which regulated the registration of Civil Engineers under the direction of the Louisiana State Board of Engineering Examiners.

Four regular meetings of two days and ten special meetings of one day were held during the year. Written examinations for Professional Engineers and Land Surveyors were given in February, May, August and November.

The following is a tabulation of the applicants considered during the year:

Professional Engineers

Applicants considered	676
Applicants approved by:	
Graduation	472
Long Established Practice	20
Reciprocity	58
Written Examination	9
Applicants disapproved	116
Applications withdrawn	1

Land Surveyors

Applications considered	37
Applicants approved by written exam...	16
Applicants disapproved	19
Applications withdrawn	2

The number of registrations continued to increase during the past year. The total number of registered Professional Engineers passed the 5000 mark with an increase of 460 for the year. The following is a tabulation by years of the total number of Professional Engineers, Land Surveyors and Public Employees registered by the Board:

Year	Professional Engineers	Land Surveyors	Public Employees
1951	2406	114	341
1952	2746	133	313
1953	3340	142	334
1954	3640	152	286
1955	3991	160	278
1956	4469	170	276
1957	5002	176	271
1958	5462	186	267

The following is a tabulation of the registered Professional Engineers by branches as of February 1, 1958:

Agricultural	41
Chemical	406
Civil	2076
Electrical	903
Mechanical	1379
Metallurgical	12
Mining	19
Petroleum	354

Board Designates Louisiana Engineer

The LOUISIANA ENGINEER has, starting with issue, alloted to the Louisiana State Board of Registration for Professional Engineers and Land Surveyors, a certain amount of space in the publication which will be devoted to the activities, etc., of the Registration Board.

A committee of the board comprised of Donald Derickson, Ben T. Bogard, Leo Odom and F. W. zur Burg, have been designated by the board as publications committee.

Construction of a new $457,000 natural gas cycling plant has been completed at St. Joseph by the Commercial Gas Processing Co. Products of the plant will include butane, propane and liquified petroleum gasses.

* * * *

Construction expenditures of Middle South Utilities, Inc., this year will total $71.3 million, compared with $64.7 million in 1958, according to a report of the Louisiana Power and Light Co.

* * * *

A new airplane assembly plant is under construction at Lafayette by Crescent Aircraft Puerto Rico, Inc. The firm will manufacture a number of types of aircraft for executive and business uses.

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Falk Couplings & Reducers
D. P. James Couplings & Reducers
Acme Roller Chain & Sprockets
Harbison Walker Refractories
Jeffrey Chain, Sprockets, Elevators & Conveyors
Worthington Pumps & Compressors
Strong Carlisle & Hammond Steam Traps, Reducing Valves, Regulators, etc.

Industry In Louisiana

Shreveport– Growing Like Topsy

Occasionally the busy Louisiana engineer pulls up from his project and looks around him to see where it fits into the economy of his era. In this article, especially prepared for The Louisiana Engineer, Rolle R. Rand, vice president and general manager, the Shreveport Chamber of Commerce outlines his growing area's bustling activity. E. M. Freeman, of Shreveport, is immediate past president of the Louisiana Engineering Society.

The economic growth of Shreveport in the last few years has been sound, steady and diversified. The growth has been so rapid that in many other communities it would have been termed fantastic. With Shreveport's long position of leadership in North Louisiana, South Arkansas and East Texas, the community's citizens are inclined to accept such growth with pride.

Established in 1836 and incorporated in 1839, it served as the early gateway to the expanding Southwest. Located at the head of navigation on the Red River, it developed rapidly as a steamboating and trade center.

During the Civil War, Shreveport became the last capitol of the Confederacy, General E. Kirby Smith surrendered here to United States forces more than a month following the fall of the Richmond Government and General Lee's surrender at Appomattox.

The city was untouched by the physical catastrophe of the war. Shortly thereafter the railroads, which six years before had started from Shreveport, were linked up with major Southern routes. The city rapidly became a rail transportation center. It grew steadily throughout the ensuing years.

Then in 1905 oil was discovered some 15 miles from the community in North Caddo Parish. The rapid development of the rich Caddo Lake and other fields brought a continuing development to the area, and in 1932 the almost indescribable riches of the East Texas oil field were opened.

Steady Growth

Since that time, Shreveport has grown steadily as a center of oil and gas production, refining, and as a center of oil and gas pipe line networks.

Shreveport has long been Louisiana's second city. The population of the Shreveport Metropolitan area has grown some 73 per cent since 1940. At the present time, the city is rated 68th in size in United States cities as compared with 105th in 1940. Family units in the area increased some 72 per cent during the same period.

Illustrating this growth are several interesting statistics which show that building permits soared from $4,-800,000 in 1940 to above $31 million last year, an increase of 546 per cent.

Employment in the Shreveport area in 1940 totaled 59,800, while in 1958 it totaled 197,850 persons, or an increase of 63 per cent. Last year, per family income was an all-time high of $5973 per family, making Shreveport one of the richest cities in the entire South.

Business development in the community has been rapid. Due to the nature of the geographical location, the city has rapidly become a focal point for such activities as insurance offices, medical facilities, district sales offices and warehousing. To take care of this growth a modern, 20-story, 200,000-square-foot office building was completed in 1956 and is fully occupied by tenants, most of them in the oil and gas industry.

Large Utility Companies

Shreveport is the home of two of the country's largest utility companies. A resident of the city since 1940 is the United Gas Company and affiliated organizations. Last year this group of companies sold over $300 million worth of natural gas and has assets in execess of $678 million. It operates throughout the South from a large, beautiful office building containing more than 200,000 square feet of space.

In 1947 the Texas Eastern Transmission Corporation commenced operations from Shreveport, and purchased the famous Big Inch and Little Inch Pipe Lines, which were constructed by the United States Government during World War II. Today this company has over $766 million in assets and operates throughout the Southwest and Eastern United States transmitting both natural gas and liquified petroleum products by pipe line.

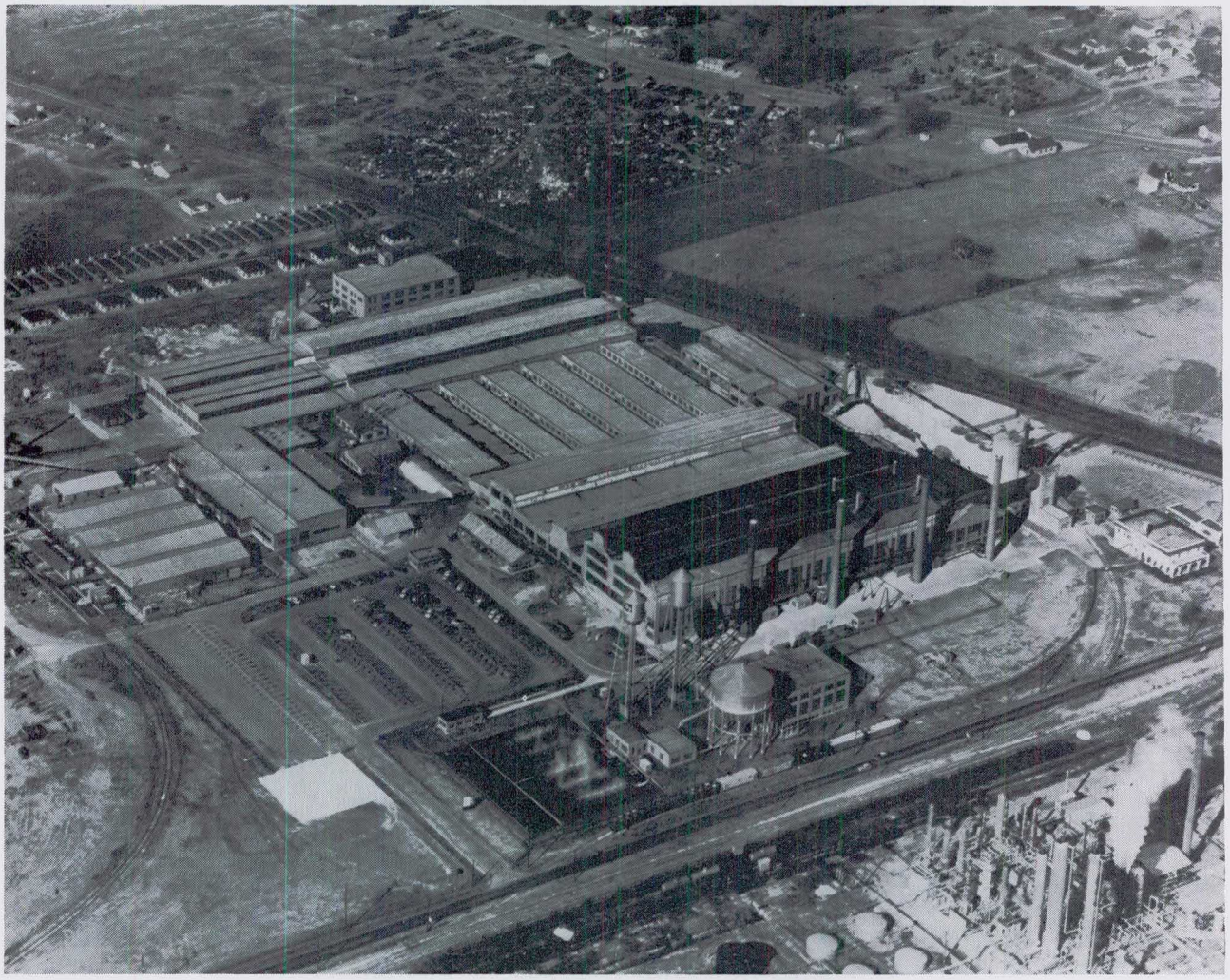
Other notable companies which have home offices located in Shreveport include The Arkansas Louisiana Gas Company, a utility company providing gas service for much of Arkansas and North Louisiana. This company recently has been diversifying broadly into such fields as cement, gas, air conditioning units, gas lights, and transportation equipment. The Interstate Oil Pipe Lines, a subsidiary of Standard Oil Company of New Jersey and the nation's fourth largest oil pipe line company, moved its home offices to Shreveport from Tulsa, Okla., in 1950. Southwestern Electric Power Company maintains its home offices in Shreveport, and within the last year has announced a $24 million expansion program in the Metropolitan area to assure the continuing supply of electrical energy to this area.

Diversified Economy

Shreveport has a diversified manufacturing economy which has grown steadily within the past few years. In 1940, 158 plants were operating in the Shreveport Metropolitan area; in 1950, the number had grown to 203 and by 1958 to 340, an increase during the 18-year period of 121 per cent.

One of the world's largest glass manufacturing plants located in Shreveport in 1922, and finding conditions favorable, has grown steadily since that time. Today the Libbey-Owens-Ford Plant Number 2 is considered to be the second largest window glass manufacturing plant in the entire world, employing over 800 workers.

In 1913 a small sheet metal shop was established in Shreveport, which grew into the present J. B. Beaird Division of the American Machine and Foundry Company, one of the pioneer manufacturers of liquifying



This aerial view shows facilities of Libbey-Owens-Ford Glass Co., of Shreveport, one of the largest flat glass manufacturing plants in the world. Window glass manufactured in this plant is used throughout the southwest. Lower right corner of picture shows a portion of Atlas Refining Co., which manufactures a number of petrochemical items for special purposes.

petroleum gas pressure units. Other notable Shreveport manufacturing firms include a branch plant of Bird and Son Asphalt Roofing Manufacturers; the Brewster Company, a manufacturer of heavy drilling equipment; and Universal Manufacturing Company, one of the country's largest manufacturers of children's playground equipment, located in nearby Bossier City.

After years of intensive work, in 1932 the Shreveport Chamber of Commerce attracted to this city a flying field to be the home of the Third Attack Wing of the Army Air Corps. Today this field has grown in size to the mighty Barksdale Air Force Base where over 10,000 military and civilian personnel are employed.

Jets In Operation

Today KC 135 Jet Tankers, and B-52 Jet Bombers operate from this field. Barksdale is also the headquarters for the Second Air Force, a major Strategic Air Command component. Barksdale's $35 million a year payroll provides a considerable impact on the Shreveport economy.

Shreveport is the banking center for the North Louisiana and the East Texas area. Seven banks operate in Shreveport and Bossier City including the state's oldest banking institution. Deposits at the end of 1958 totaled $345,599,651.42 while the total resources reached $380,-123,526.32.

Far Reaching Steps

Shreveport has taken far reaching steps in order to match its growth potential. The Shreveport Metropolitan master plan has long been considered one of the outstanding plans of its type in the country. It assures the continuing growth and development of urban Shreveport and of a maximum desirable utilization of all land resources. Recently, an outside consulting firm studied the growth potential of Shreveport and after a careful examination of all of the economic factors in the area, felt that Shreveport's present population of some 260,000 persons would grow to 365,500 persons by 1975. Surely the continuing growth and development of Shreveport will be an outstanding accomplishment in Louisiana's future.

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(Continued on Page 18)

(Continued from Page 10)

Kerrigan, John Esmond, Jr.	1136 Octavia St., New Orleans, La.	Civil
Kincaid, Eugene E.	2202 Idlewood, Tyler, Tex.	Petr.
Mann, Harry Thomas	74 Ben Smith Rd., Ruston, La.	Elec.
McClanahan, Edwin A.	1285 Schex Dr., Bossier City, La.	Civil
McNutt, Edwin Roland	P. O. Box 401, Gramercy, La.	Mech.
Meyer, James Louis	Rt. 2, Box 130, Pineville, La.	Chem.
Miller, Ernest Martin	6604 Camphor St., Metairie, La.	Petr.
Nicholls, Thomas C., III	4209 South Dr., New Iberia, La.	Petr.
Oden, John Tinsley	2301 Jackson St., Alexandria, La.	Civil
Perkins, Maynard F.	300 N. Eastwood, Mt. Prospect, Ill.	Civil
Pietrocarlo, Joseph A.	552 Roseland Parkway, Harahan, La.	Mech.
Pigue, Paul Wesley, Jr.	839 Natchez, Shreveport, La.	Petr.
Plaisance, John Wayne	2502 South Bayou Dr., Golden Meadow, La.	Civil
Rhodes, Joseph Lee	950 Linden, Shreveport, La.	Petr.
Robards, Charles Henry	7227 S. Claiborne Ave., New Orleans 25, La.	Elec.
Roberts, Dan H., Jr.	311 Buena Vista Pl., Memphis, Tenn.	Civil
Shannon, Garner I., Jr.	420 Wichita St., Shreveport, La.	Civil
Smith, Allen L., Jr.	2350 Hillsdale Ave., Baton Rouge, La.	Petr.
Smith, Lenard Barnett	137 Phyllis Ct., New Orleans 23, La.	Civil
Speyrer, Henry Roy	8320 N. Essen Hghts. Ct., Baton Rouge, La.	Petr.
Star, Albert Aarre	16 Park Ave., New York 16, N. Y.	Elec.
Stracener, Arthur M., Jr.	510½ N. Monroe, Ruston, La.	Elec.
Sykes, William Wilbur	2857 Revere St., Jackson, Miss.	Civil
Taubert, William H., Jr.	453 Siwanoy Pl., Pelham Manor, N. Y.	Elec.
Wagnon, James Cosby	123 Peach St., Ruston, La.	Civil
Wallace, Carl Preston	4425 McFarlin Blvd., Dallas, Tex.	Mech.
Warner, Harry Wesley	300 Leaway Dr., Baton Rouge, La.	Petr.
Watkins, Jack	8603 Anacortes, Houston 17, Tex.	Civil
Wedemeyer, Bruce Alan	3508 Bissonet Dr., Metairie, La.	Mech.
Wilber, Stanley Roy	201 First Blvd., West Barksdale AFB, La.	Civil
Williamson, Jimmy Claude	111 Cooktown Rd., Ruston, La.	Civil

On March 10, 1959

Atkinson, Harry W.	600 E. California Ave., Ruston, La.	Civil
Becker, Bernard M.	Box 42, Rte 2, Palatine, Ill.	Chem.
Blount, Ralph D., Jr.	3322 Carlotta Ave., Baton Rouge, La.	Elec.
Brantley, Thomas K.	936 N. 5th St., Baton Rouge, La.	Civil
Calgreen, William	Box 623, Port Sulphur, La.	Chem.
Eddy, Lee B.	322 N. Emerson St., Mt. Prospect, Ill.	Elec.
Ellerbe, James E.	2635 Madison Ave., Baton Rouge, La.	Mech.
Gordon, Frank V., Jr.	610 Huron St., Shreveport, La.	Civil
Grossman, Rene E.	2229 Napoleon Ave., New Orleans, La.	Elec.
Guillory, Stafford D.	General Delivery, Mamou, La.	Elec.
Guth, John J., Jr.	834 Delaware, Shreveport, La.	Mech.
Hiller, Alfred E.	P. O. Box 194, Port Sulphur, La.	Chem.
Kavanagh, Thomas C.	126 E. 38th St., New York 16, N. Y.	Civil
Landry, Alton A.	Box 211, Port Sulphur, La.	Chem.
McInnis, Frank F., Jr.	9515 Jefferson Hwy., Baton Rouge, La.	Mech.
Moore, Grover S., Jr.	6912 Chocolate Bayou Rd., Houston, Texas	Mech.
Morris, James W., Jr.	2018 Second St., Lake Charles, La.	Mech.
Pekor, Charles B.	5615 Kenilwood Dr., Houston, Texas	Civil
Romero, Earl M.	Box 186, St. Bernard P. O., La.	Mech.
Scott, Harold E.	342 Oriole Lane, Shreveport, La.	Mech.
Thompson, Walter C.	2018 Melissa St., Arlington, Texas	Civil
Wamsley, Paul, Jr.	5974 Hyacinth Ave., Baton Rouge, La.	Metallurgical
Watkins, James D.	2335 Calder St., Beaumont, Texas	Mech.
Carter, Robert T.	902 W. 5th St., Bogalusa, La.	Land Surveyor
Childress, Thomas A.	Box 175, Isola, Miss.	Land Surveyor
Johnson, James E.	729 Sadie Ave., Metairie, La.	Land Surveyor
Knapp, Warren J.	1801 20th St., Lake Charles, La.	Land Surveyor
Lantier, Ivy, Sr.	P. O. Box 41, Scott, La.	Land Surveyor
Perret, Jules J.	3218 Joliet St., New Orleans, La.	Land Surveyor
Waldrep, Walker L.	510 Main St., Plaquemine, La.	Land Surveyor

Gas Content Of River

W. W. Chew, Virgil Orr, G. H. Panula, and J. W. Malone
Department of Chemical Engineering
Louisiana Polytechnic Institute
Ruston, Louisiana

It is a well established fact that the solution of gases in water is a direct function of temperature. Data are available in the literature for the equilibrium solubililty of air and several pure gases in water as a function of temperature. For turbulent streams carrying organic matter and sediment other factors could become important. This investigation was undertaken to establish the nature and magnitude of any variations of the dissolved gas content of Mississippi River water with temperature, barometric pressure, sediment content, sediment size distribution, and factors related to the rate of discharge as a measure of turbulence.

The most probable gases present would be oxygen, nitrogen, and carbon dioxide from the air and hydrogen, methane, carbon dioxide, hydrogen sulfide, and perhaps ammonia from the decomposition of organic matter present in the stream. No attempt was made during this investigation to identify these constituents. The total volume only was determined.

An evolution temperature of 70°C. was chosen as being an upper limit for most plant processes and simultaneously representing a relatively small equilibrium gas content. Heating of the water sample for 48 hours was deemed sufficient to evolve the dissolved gases in the measuring burette and to reach the equilibrium gas contents. Aerobic mesophilic and thermophilic organisms could complicate the thermal evolution of gas by utilizing dissolved oxygen and releasing carbon dioxide. Facultative anaerobic organisms could become effective after evolution of the dissolved oxygen resulting in the evolution of both carbon dioxide and methane and the reduction of sulfates with release of hydrogen sulfide. Anaerobic reduction of nitrates might also release nitrogen or ammonia. Any mesothermal or mesophilic organisms would be effective for only a short period during heating of the sample since the final temperature would destroy or effectively inhibit the action of these organisms. Kinetic considerations would indicate some effect from these however. Any resistant thermophilic organisms present could remain effective throughout the entire period of gas evolution.

If adsorption of gas molecules on the finely divided sediment present in the river water was in effect, the amount of adsorption should be related to the surface area of the sediment which is in turn a function of the amoundt and size distribution of the sediment. Heating of this sediment to 70°C. was deemed sufficient to desorb and evolve adsorbed gases significantly.

Henry's Law indicates an effect of total pressure (barometric pressure) on the amount of solution gas in a given liquid solvent. The variation of barometric presseure is a relatively slight effect and should not strongly affect the amount of dissolved gases in a flowing, turbulent stream.

Sampling and Testing

Sampling on the Mississippi River was done from the rear deck of the United States Corps of Engineers' launch which was approximately forty feet long and inboard motor driven. River water samples were obtained by using their P-46 sampler. This sampler is described in detail in Report No. 6, "The Design of Improved Types of Suspended Sediment Samplers," Corps of Engineers, U. S. Army, St. Paul, Minnesota. Samples were taken at 0.4 the depth of the river on the United States Corps of Engineers' Vicksburg River Discharge Range. All samples were taken from the same point on the range with the triangulation of the location of the point being 63°55′. The point was approximately at mid-stream. The data taken while sampling on the point were air temperature, river water surface temperature, river water sample (4.4 depth) temperature, observed velocity at 0.4 depth, calculated mean velocity of river on the point, bridge gauge reading, barometric pressure, and river discharge.

River water samples for gas content determination were placed in one pint polyethylene bottles for transfer to the laboratory. The sample bottles were filled com-

E. M. FREEMAN AND ASSOCIATES

CONSULTING ENGINEERS

HENRY C. BECK BUILDING SHREVEPORT, LA.

pletely with river water from the P-46 sampler. All gas bubbles were removed and the bottles were capped to exclude the air. The filled polyethylene sample bottles were placed in an ice-water bath for transportation. Samples for sediment determination were obtained from the P-46 sampler in one half pint milk bottles. The milk bottles containing the river water samples were capped tightly and placed in an ice-water bath for transportation to the laboratory for analysis.

The dissolved gas content of the river water was measured by placing the cold river water in a specially constructer gas determination apparatus. The apparatus consisted of a glass cylinder of approximately 100 millimeters capacity having a small diameter, elongated, and graduated section at the top. This part of the apparatus was constructed from a 100 millimeter capacity centrifuge tube and a smaller 15 millimeter capacity centrifuge tube. The lower conical portion, approximately 10 milliliters capacity, was removed from the larger centrifuge tube and the 15 milliliter tube was then sealed onto the larger tube. The graduations on the attached 15 milliliter tube could be read to the nearest 0.1 millimeter. The other part of the apparatus was a glass container of slightly larger diameter than the lower and larger section of the gas measuring apparatus. Mercury was used to maintain a gas tight seal in the entire apparatus.

A measured amount of cold river water was placed in the inverted gas measuring burette. Mercury was then added to completely fill the burette. A small glass plate was placed over the mouth of the apparatus to exclude the air, forming a seal on the smoothly ground mouth of the burette. The larger diameter glass container was inverted and placed over the apparatus with the bottom of the container holding the glass plate securely over the mouth of the apparatus. The entire apparatus, gas measuring part and the glass container, was placed in an upright position and mercury poured into the annuar space, thus sealing the river water in the gas measuring burette. The loaded apparatus was placed in an electric oven and the temperature maintained at 70°C. The volume of evolved gas was read after 48 hours. Other readings taken were room temperature, barometric pressure, oven temperature, and height of water in apparatus. The dissolved gas volume was corrected to dry conditions at 32°F. and standard atmospheric pressure.

The total amount of sediment and size distribution were determined by using a bottom withdrawal sedimentation tube. The procedure followed for these determinations was taken from Report No. 7, "A Study of New Methods for Size Analysis of Suspended Sediment Samples" published by St. Paul United States Engineer District Sub-Office, Hydraulic Laboratory, University of Iowa, Iowa City, Iowa.

The surface area of the sediment in 100 milliliters of river water was estimated in the usual manner, using the size of the sediment and the cumulative percent finer as determined by the above procedure. Surface area for quartz as reported by G. G. Brown and Associates was used in estimating the surface area.

Discussion

Rank correlation is one method used to statistically evaluate the existence of a relationship between two sets of measurements independently made. In this method the two sets of measurements are ranked according to numerical size from 1 to **n** when **n** is the number of individual measurements in each set. The formula expressing the coefficient of correlation of rank is where **d** is the difference between the values of rank for each pair of measurements and **n** is the total number

$$R = 1 - \frac{6 \sum_{1}^{n} d^2}{n(n^2 - 1)}$$

of measurements of the two variables. If both sets of measurements had exactly the same arrangement of rank, the value of R would be 1 inasmuch as each **d** term would equal zero. This would be perfect positive rank correlation. If the orders in rank of the two variables are exactly the reverse of each year, R would be –1. This would give perfect inverse rank correlation.

The gas contents were successively correlated in rank with temperature, total sediment, sediment area, barometric pressure, sampling depth, water velocity, and total discharge. The following values for R were obtained:

Temperature	–0.858
Total sediment	–0.0466
Sediment area	–0.199
Barometric pressure	0.316
Sampling depth	0.0477
Water velocity	0.0617
Total discharge	0.0602

Only gas content versus temperature gives a significant rank correlation coefficient. The negative sign indicates an inverse relationship. The actual value of –0.858 approaches perfect inverse rank correlation. A value of –0.549 for a population of 20 (the number of samples taken) indicates the 99% confidence limit. Thus the value of –0.858 indicates that there is much less than one chance in a hundred of being wrong in stating that gas content is inversely related to the water temperature. This, of course, is well established scientifically.

The value of R found for barometric pressure of 0.316 is somewhat lower than the 0.433 that is the 95% confidence limit for a population of 20. This value would indicate that fluctuations in barometric pressure are of some significance as indeed Henry's law states. The values found for total sediment with gas content respectively are too small to be of any significance. Thus it can be safely said that these factors are of negligible influence on total dissolved gas content.

The negative value for sediment area might indicate a slight significance for actual deaeration due to bubble formation and accretion on the surface of suspended solids. Certainly there is no statistical evidence by means of rank correlation for the adsorption of dissolved gases playing any role in dissolved gas content. From both a statistical standpoint (the number of any given kind of molecules in the neighborhood of a suspended solid particle) and the hydrogen bonding effect of the water molecule it could be presumed that the equilibrium state would find an overwhelming amount of solid surface area covered with adsorbed water molecules to the comparative exclusion of the so-called dissolved gases.

McCONE

(Continued from Page 5)

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Looking into the future, he said the problem immediately at hand is to produce competitive atomic power at the earliest date.

"This, in our opinion, will be done first in plants in which the uranium fuel is consumed just as is consumed in a boiler. There are countless possible reactor concepts which seem to evolve in the minds of scientists and the engineers. At one time it was felt that almost any promising concept should be given support. It was also felt that a concept could be proven by a small experimental reactor and a certain amount of research and development effort. We have not found this to be the case. The experimental reactor, in answering some questions, has a habit of asking a great many more. This, then calls for another experimental reactor and then another, or perhaps a small demonstration generating plant. We believe that each reactor concept must go through an evolution of development. Experience has proven to us that no easy shortcuts are to be found."

(Continued from Page 14)

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La. Engineering Society

Minutes of Annual Meeting of the Board of Direction with State Section Officers
Friday, January 16, 1959

The meeting was called to order by President Roy T. Sessums with Messers. Fred R. Adams, Tom E. Alexander, Ben T. Bogard, Emery Domingue, Louis Duclos, A. W. Durning, E. M. Freeman, M. D. Garrison, Queutin W. Hargrove, O. T. Ice, Jr., H. Leiendecker, E. A. McLellan, A. M. Moore, W. S. Nelson, Frank Riess, W. H. Scales, Glen L. Smith, W. L. Sutton, A. C. Thigpen and J. P. Fernandez present. Messrs. C. A. Peyronnin Jr., Editor of THE LOUISIANA ENGINEER, and Allen H. Jensen, General Chairman of the 1959 Annual Meeting, also were present by invitation.

President Sessums requested each one present to introduce himself, after which he announced that several items of general interest to all sections would be discussed at this meeting. He congratulated the gathering on being the best attended session of its kind in the society's history, with all sections well represented. He urged sections to participate in meetings of the Board of Direction during the year by the attendance of their presidents or other authorized representatives.

Before proceeding with the discussion, Mr. Freeman moved that the President and the Secretary-Treasurer be authorized to sign checks for the society and that either or both of them be authorized to have access to the society's safety deposit box. The motion was seconded by Mr. Nelson and carried.

Discussion followed on next year's Annual Meeting and Mr. Freeman moved that it be held on January 7-8-9, 1960, provided facilities are available. The motion was seconded by Mr. Hargrove and carried. Mr. Alexander invited the society to hold a meeting in Baton Rouge in 1960 or 1961, after which it was pointed out that both Shreveport and Lafayette desired to be hosts to future annual meetings. It was recalled that, following the successful meeting held at Baton Rouge in 1956, consideration was given to meeting at Lafayette and Shreveport and the Board at that time felt that New Orleans should be the location for the meeting at least every other year.

Mr. Duclos moved that the 1960 Annual Meeting be held in New Orleans, seconded by Mr. Hargrove and carried. Mr. McLellan moved that the Baton Rouge Section's invitation to hold a meeting in 1961 be accepted, seconded by Mr. Duclos. Mr. Bogard then introduced a substitute motion to appoint a committee to determine the time and place for future annual meetings beginning with 1961, so that a schedule at least two years in ad-

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vance could be planned. The motion was seconded by Mr. Freeman and carried.

Discussion followed on the desirability of including exhibits in the 1960 meeting. Mr. Nelson moved that no exhibits be held, seconded by Mr. Riess and carried.

President Sessums announced that a Section Coordination Conference would be held at Alexandria on Saturday, March 21. He urged the newly elected officers to appoint committeemen who would be able to attend. He also announced that a meeting of the Board would be held in Alexandria on Friday, March 20 at 7:00 p. m. and requested the Section Coordination Committee, through President Andrew M. Moore of the Alexandria Section who was present, to make arrangements for a suitable place.

Discussion of the Engineering Registration Act followed and it was the concensus of opinion among those present that a educational program was needed, starting with society members, then including all registered engineers, and continuing on to the general public and the state legislators. Mr. Duclos stated that, if the proposed amendment to the present Act is again introduced, the Legislative Committee Chairman should be given full instructions and authority to act for the society, since decisions must be made promptly at hearings and there is not sufficient time for the committee to report back to the Board of Direction.

Mr. Scales stated that all sections and individual members should try to develop the friendship of our legislators by inviting them to attend local meetings and introducing them to the members at large.

Discussion followed on the society's publication and it was brought out that many technical articles from the state sections, registration board, Department of Highways, Public Works Department, NSPE and EJC could be published in the LOUISIANA ENGINEER. It was recommended that the editor appoint representatives throughout the sections to collect and forward material for his selection.

Mr. Freeman moved that the president, secretary and first vice-president be the duly authorized representatives of the L.E.S. and alternates in the order stated for the National Society of Professional Engineers, and that the society reimburse travel and hotel expenses for those representatives attending the national society's forthcoming meeting at Birmingham. Motion seconded by Mr. Moore and carried.

Discussion followed on the question as to whether those holding Junior grade membership in the society at the tiem of affiliation with NSPE should be free to accept or reject membership in the national society when they reach full member grade. Mr. Freeman moved that any junior member of LES on the basis of the constitution in effect prior to our national affiliation. The motion was seconded by Mr. Nelson and carried.

President Sessums appointed Mr. McLellan, Chairman and Messrs. Freeman and Fernandez to constitute a Finance Committee and instructed them to prepare a budget to be presented at the next board meeting, in accordance with the constitution. It was decided that the next board meeting would be held on January 26 at 6:00 p. m. and newly elected presidents were urged to submit their recommendations for personnel to serve on state-wide committees.

Mr. Ducles moved that the society pay the expenses of the key-note speaker for the annual meeting, seconded by Mr. Domingue and carried.

Mr. Moore stated that the Alexandria Section wished to amend its constitution and was advised that the proposed amendment should be submitted to the board in writing.

Interesting discussions followed on Engineering Education and Professionalism and several good points were brought out.

Mr. Bogard moved that the board go on record officially as expressing its appreciation to Mr. Allen H. Jensen and his 1959 Annual Meeting Committee for a very fine meeting. Motion seconded by Mr. Freeman and carried, whereupon the meeting adjourned.

J. P. FERNANDEZ, Secretary-Treasurer.

———o———

New industrial business totaling 54,725 kilowatts of capacity will hook up with the power plants of Middle South Utilities, Inc., this year, according to the system's area development office in New Orleans.

* * * *

A new $7 million steam electric generating unit built by Central Louisiana Electric Co. has begun operations near St. Landry. The new facility, the station's fifth unit, has a capacity of 55,000 kilowatts.

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Memorials

JOHN SEBASTIAN BURKE

It is with extreme sorrow that we record the passing of John Sebastian Burke on January 4, 1959, in his native city, New Orleans, La., after an extended ilness.

John was beloved by all with whom he came into contact and his death will be keenly felt by all the members of the groups to which he belonged; these included, in addition to this Society, the American Society of Heating and Air Conditioning Engineers, in which organization he was past chairman of the Delta Chapter, and a member of its National Nominating Committee; New Orleans Section of the American Society of Refrigerating Engineers, in which organization he was a past president; the Engineers Club of which organization he was a member of the Board of Directors; and the Electrical Association of New Orleans.

He was born in New Orleans on February 2, 1901, and was the son of the late Mary M. Smith and the late James T. Burke. His primary education was in New Orleans schools, and he later attended Spring Hill College in Mobile and Loyola University in New Orleans. He was a registered mechanical engineer in Louisiana, and was widely known in the air conditioning, space heating, and ventilating industry. He had been associated with the New Orleans Public Service Inc. since 1923, first in the Engineering Department, but most of his years of service was with the General Sales Department. He was one of those individuals who made a definite point to make friends and to keep them. His love for people was contagious and once he knew you, you were recognized always. He was a deeply religious man and a member of the Catholic Church. He is survived by his widow, the former Violet Irwin, two sons, Irwin and John S. Burke, Jr., and three grandchildren.

Be is resolved that this obituary be read at a meeting of the Louisiana Engineering Society, entered into the minutes, published in the Proceedings of the Society, and copies be sent to members of the family.

KARL P. KAMMER, ERNEST L. MIRE

———o———

CURRY GLENN CAPPEL

C. Glenn Cappel, C. E., a resident of New Orleans, died in that city on December 12, 1958. He was born in Marksville, Louisiana, on June 21, 1892, the son of Joseph Clifton and Bena (Brooks) Cappel. At the time of his death he was a member of the W. Horace Williams Company, a division of the Williams-McWilliams Industries, Inc.

Mr. Cappel graduated from Louisiana State University with the degree of B. S. in Civil Engineering in 1912, following which he took a year of postgraduate work in structural engineering at Rensselaer Polytechnic Institute. During the next few years he gained engineering experience of a varied nature through successive periods of employment with the U. S. Engineers, the New York Central Railroad, the Alabama Power Company and the Louisiana State Highway Department. In 1919 he was employed as a structural engineer by Favrot and Livaudais, Architects of New Orleans, and the following year he became connected with the contracting firm of Doullut & Williams Company in the capacity of assistant general manager and chief engineer upon a terminal project in Mexico. He returned to New Orleans in 1921 and served as manager of the building department until the dissolution of the company in 1924.

Mr. Cappel then joined the engineering and contracting firm of W. Horace Williams Company, Inc. of New Orleans as a vice-president, and later on as a partner, in responsible charge of numerous building, wharf and harbor developments. During World War II, he was project manager for his company in direct charge of Army and Navy projects in Louisiana including the construction of Camp Claiborne, Camp Polk, the Belle Chasse Ammunition Depot and the Naval Air Station at Houma. For his outstanding performance in connection with the last named project he was awarded a Meritorious Civilian Service citation by the Navy in 1944.

In 1915 Mr. Cappel became a member of the Louisiana Engineering Society. Active in the affairs and committee work of the Society he was elected a Director in 1937 and then after several years of service on the Board of Direction he was elevated to the Presidency in 1942 for a one-year term of office. In 1951 the Louisiana Engineering Society conferred Honorary Membership upon him in recognition of the eminent position which he had attained in his profession through his engineering proficiency and in appreciation of his services to the Society. He was the recipient in 1953 of the Society's Technological Accomplishment Medal which is awarded for accomplishments contributing to the advancement of engineering.

Elected an Associate Member of the American Society of Civil Engineers in 1920, Mr. Cappel advanced to the grade of Member in 1924. Prominent in the activities of the Society at the local level he became President of the Louisiana Section in 1946. He later was elected a Director of the parent society, serving as the representative of District 15 for the 1948-50 term. Mr. Cappel was the author of many articles which appeared in CIVIL ENGINEERING, the journal of the A. S. C. E., and other publications. In 1945 and again in 1948 he was awarded the Construction Engineering Prize of the American Society of Civil Engineers, an award which is given annually to the author of the best original scientific or educational article on construction printed during the year in the Society's journal.

Mr. Cappel was registered as a Professional Engineer in the States of Louisiana, Florida and Texas. Locally he was a member of the Engineers Club of New Orleans, the International House and the Metairie Country Club.

On March 21, 1915, Mr. Cappel was married to Julia Lea Pumphrey in Baton Rouge, Louisiana. He is survived by his widow; his brother, Frank B.; a daughter, Bena Lea; a son, Roy Glenn; and four grandchildren, Carol Anne, Carl Glenn, Christie Lea and Richard Yost Cappel.

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INDEX OF ADVERTISERS

A-1 Employment Service	22
American Creosote Works, Inc.	2
W. S. Dickey Clay Mfg. Co.	4
Eugene Dietzgen Co.	6
E. M. Freeman & Associates	16
A. M. Lockett & Co., Ltd.	22
New Orleans Blue Print & Supply Co., Inc.	20
New Orleans Public Service Inc.	23
Professional Listing	18-19
Reagan Tool Co.	2
Sier Bath Gear & Pump Co.	24
Standard Supply & Hardware Co., Inc.	11
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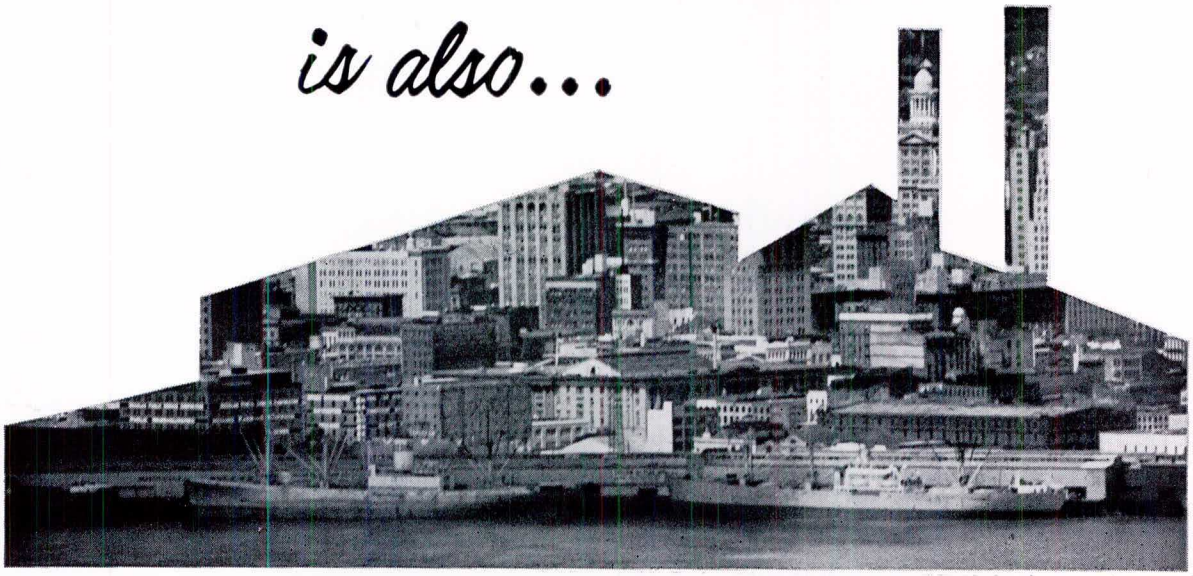

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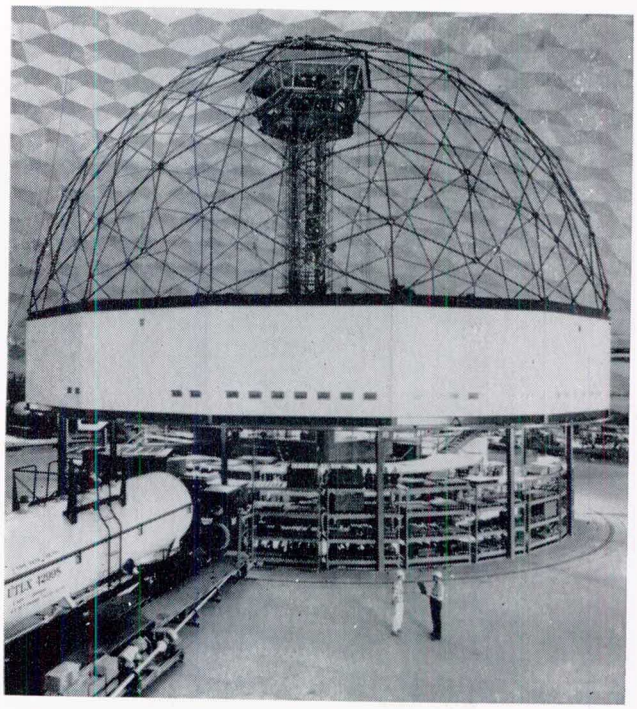

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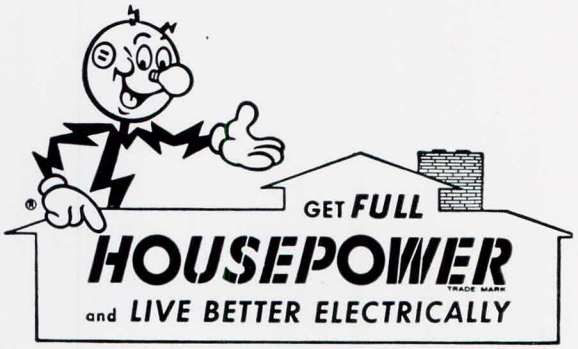

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Vol. 45 **June, 1959** **No. 3**

CONTENTS

	Page
LES OFFICERS, STANDING COMMITTEES	4
LES MINUTES, NEW MEMBERS	5
KAISER GRAMERCY'S NEW BRINE LINE	7
DRAINAGE DISTRICTS OF SOUTHERN LA.	8
FIELD NOTES; NSPE, EJC NEWS	10
PROFESSIONAL ENGINEERS GRANTED REGISTRATION	11
UNION TANK CAR USES RADIAL PLAN	12
PROFESSIONAL LISTING	12-13
LA. ENGINEER REGISTRATION HISTORY	14
MEMORIALS	20

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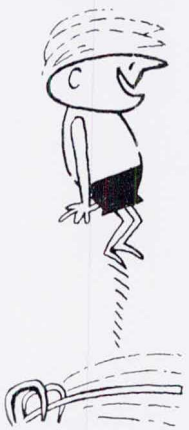

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Letters

To the Editor:

Through some unknown benefactor's courtesy I have just received a copy of the February issue. It came as a very welcome surprise.

I am a registered Civil Engineer in Louisiana, No. 5910, but am not a member of the Louisiana Engineering Society. After reading the article on "The Way to a Greater Profession" I would like to apply for membership.

My permanent home is 104 Hilltop Circle, New Iberia, La. However, I am on active duty in the Navy, presently assigned as Officer in Charge of Construction, Southeast Asia, with headquarters in Bangkok, Thailand. My territory covers Thailand, Laos, Cambodia and Vietnam. The article on "U. S. Technologists Abroad" was of interest. We employ a number of them in the planning, design and construction phases of the Military Assistance Program.

CAPT. EDGAR B. HICKEY, CEC, USN.

To the Editor:

Chairman (John A.) McCone has asked that I express his appreciation for a copy of The Louisiana Engineer, with its very thorough coverage of his appearance before the Edison Electric Institute on May 7.

DWIGHT A. INK,
Special Assistant to the Chairman
U. S. Atomic Energy Commission
Washington, D. C.

To the Editor:

The April issue of The Louisiana Engineer has just reached my desk. I hasten to compliment you.

E. M. (JIGGS) FREEMAN,
E. M. Freeman & Associates
Shreveport.

La. Engineering Society

Minutes of meeting of the Board of Direction held at the Engineers' Club, New Orleans on May 11, 1959

The meeting was called to order by President Sessums with Messrs. Bogard, Durning, Freeman, Janssen, McLellan, Riess and Fernandez present. Mr. Freeman moved that minutes of the preceding meeting be accepted as distributed to board members by mail, seconded by Mr. Durning and carried.

Mr. McLellan, Chairman of the Finance Committee, presented a comparative report on the 1958 and 1959 annual meetings. He also presented the treasurer's first quarterly financial report for 1959.

The secretary read correspondence between President Sessums and Mr. Charles W. Genella, Director, New Orleans Convention Bureau, concerning the NSPE convention for 1962. Mr. Freeman moved that the L.E.S. extend an invitation to NSPE to hold its principal annual meeting in New Orleans in 1962. Motion seconded by Mr. Janssen and carried, whereupon President Sessums agreed to extend the invitation.

Mr. Janssen moved that President Sessums be certified for both votes as the official Louisiana delegate at the NSPE Silver Anniversary meeting to be held in New York in June; motion seconded by Mr. Riess and carried.

A letter from Mr. Otha Barron addressed to Mr. Wiley Poole, Chairman of the 1960 State Planning Conference, was read. Mr. Bogard moved that March 25-26, 1960 be reserved for the State Planning Conference to be held at Alexandria, seconded by Mr. Durning and carried.

Mr. Freeman moved that the secretary advise the Mississippi Valley Assn. of a selected list of members to be invited to a forthcoming conference of the association, seconded by Mr. Janssen and carried.

Mr. Bogard moved that the resignation of W. M. Mooney II be accepted with regret, seconded by Mr. Janssen and carried. Mr. Freeman moved that Hubert J. Thibodeaux be dropped in accordance with his request, seconded by Mr. Durning and carried.

Mr. McLellan moved that minutes of meetings of the Board of Directors be published in THE LOUISIANA ENGINEER, seconded by Mr. Riess and carried. Discussion followed on a number of suggestions for the improvement of the publication and Mr. Bogard moved that the secretary advise the publisher of these recommendations, seconded by Mr. Janssen and carried.

Mr. McLellan moved that Dr. Francis M. Taylor be appointed chairman of a committee of his own choice to prepare the obituary of our late esteemed member, Charles S. Williamson, Jr., seconded by Mr. Freeman and carried.

Discussion followed on a resolution adopted by the Lafayette Section concerning local civic improvements and the secretary was instructed to write to the section regarding same.

A letter from the State Board of Registration requesting the society's views on a proposed model law for the registration of land surveyors and a revision to the model law for the registration of Professional Engineers was read. The secretary advised that this material had been forwarded to the chairman of the Legislative Committee. Mr. Janssen moved that the chairman, Mr. Calvin T. Watts, be requested to comment on these laws prior to the next board meeting. Motion seconded by Mr. Durning and carried.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ,
Secretary-Treasurer.

Minutes of Meeting of the Board of Direction Held at the Engineers' Club, New Orleans Monday, April 13, 1959

The meeting was called to order by First Vice-President McLellan with Messrs. Bogard, Durning, Freeman, Janssen, Riess and Fernandez present. Mr. Freeman moved that minutes of the preceding meeting be approved as distributed to board members by mail. Motion seconded by Mr. Bogard and carried.

The secretary reported that 442 ballots had been returned in the March membership election and all applicants had been elected to their respective grades. A copy of the ballot is attached to these minutes.

A report from Mr. Robert Grehan, Engineers' Week Commitee chairman for New Orleans, was presented and the board commended the committee for its excellent work and comprehensive presentation of its report.

The secretary read letters from Mesdames Pottharst and Percy thanking the society for copies of the Louisiana Engineer in which memorials to deceased members of their families were published.

A letter of resignation from Mr. Rathbone DeBuys was read and Mr. Bogard moved that, in view of Mr. DeBuys' position as the only living Charter Member of the society, the thirty-year paid-up membership rule be dispensed with and that Life Membership be bestowed upon Mr. DeBuys. Motion seconded by Mr. Freeman and carried.

In view of the fact that Thomas J. Regan Jr. has moved out of the state since applying for membership and has not acknowledged his election, it was moved by Mr. Riess that his election be declared void. Motion seconded by Mr. Janssen and carried.

The resignation of Larry L. Moreau was accepted with regret upon motion by Mr. Durning seconded by Mr. Freeman and carried.

Mr. Mallard Seago, Chairman, Public Relations Committee, presented entries received to date in the new cover contest for the Louisiana Engineer. After reviewing the entries Mr. Freeman moved that the board delegate authority to select the winner to the Public Relations Committee. Motion seconded by Mr. Bogard and carried.

There being no further business the meeting adjourned.

JOHN P. FERNANDEZ,
Secretary-Treasurer

New Members

Fletcher H. Bahm, Shreveport; Donald L. Callahan, Fred M. Fister, New Orleans; Charles W. Hill, Baton Rouge; David L. Johnson, Ruston; Jamie H. Kerr, Jr., Houston, Tex.; Robert B. Lane, Shreveport; John W. Lipscomb, Baton Rouge; Fred S. Moore, Lafayette; William N. Sessions, Shreveport; Paul N. Stevens, New Orleans; Russell A. Woodall, Shreveport.

TRANSFER FROM AFFILIATE

Earl J. Martel, Baton Rouge.

TRANSFER FROM JUNIOR MEMBER

James R. Neef, Lafayette; Arthur R. Theis, Shreveport.

AFFILIATE MEMBER

Thomas F. Conley, New Orleans; Henry A. Lagasse, Jr., New Orleans; Leo P. McCurnin, Jr., New Orleans.

TRANSFER FROM JUNIOR TO AFFILIATE

Eugene E. Sikes, Jr.

JUNIOR MEMBER

Chris R. Ansel, Jr., New Orleans; Charles E. Cole, Lake Charles; Charles M. Higgins, Baton Rouge; Floyd E. Milford, Jr.; John M. Paine, Baton Rouge; Robert T. Reinsch, Baton Rouge; David N. Ridge, Wichita, Kans.; James W. Souders, Baton Rouge.

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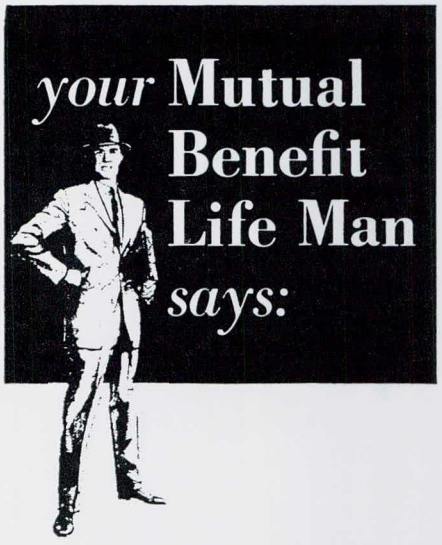

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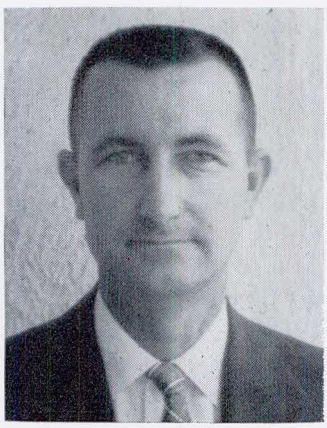
Kaiser's New Brine Facility

Pipeline Supplies Gramercy Plant

By WARREN M. ROBBINS

Mr. Robbins' article, written for The Louisiana Engineer, deals with one phase of activity at Louisiana's newest plant, the Kaiser Aluminum & Chemical Corp. Gramercy plant, which started up May 21.

Kaiser Aluminum & Chemical Corporation has recently completed a $700,000 brine facility for supplying its Caustic Chlorine Plant at Gramercy, La.



WARREN M. ROBBINS
. . . a new facility

The Caustic Chlorine Plant has a capacity of 100 tons per day of liquid chlorine and 114 tons per day of 50% caustic soda. The caustic soda is being used to process bauxite in the new Alumina Plant, also located at Gramercy. The Caustic Chlorine Plant has been in operation since January of 1958, and until completion of the brine facility in April 1959, has been supplied with rock salt as a raw material. The salt has been delivered by rail.

The brine is now supplied directly from the Sorrento salt dome, located approximately five miles east of Sorrento, Louisiana. The pipe line carrying the brine is six inches in diameter and is twelve miles long. It carries 150 gallons per minute of brine with a specific gravity of 1.19. This is the present rate of consumption in the Caustic Chlorine Plant. The schedule 40 steel pipe line can carry an ultimate of 450 gallons per minute when increased caustic chlorine facilities require it. The friction head losses for 150 gallons per minute, measured in the line, amount to approximately 100 feet, or .16 feet per 100 feet of pipe.

Friction Factor

The friction factor used in the design was f- .025 and was selected for brine with a density of 1.2 and a viscosity of 2.82 centipoises. The measured friction factor was f- .018. The pipeline runs through swamp most of its length. Construction of the line through the swamp was accomplished by pushing the pipe through the trench. One length of pipe, three miles in length, was pushed into place.

The pipe line is coated and wrapped and is equipped with cathodic protection. The brine is pumped to the plant from an earthen reservoir of 6,000,000-gallon capacity. The pump is an eight stage turbine pump with a 10 horsepower, 1800 R. P. M. motor.

The brine well is located just south of the crown of the Sorrento salt dome, on property leased from The Texas Co. Drilling operations began in January, 1959, and were completed in April, 1959. The well is one of the largest and deepest of its kind in this area. The drilling was performed by Eilers Drilling Co. of New Iberia, La. The casing program consists of a 24" diameter surface casing, a 20" diameter casing set at the 1000-ft. depth and a 13⅜" diameter casing cemented at a depth of 2901 feet. The lower section of this casing is cemented into rock salt a distance of 503 feet. The top of the salt being at elevation—2398'.

Overlying the salt dome is a rock formation 228 feet thick.

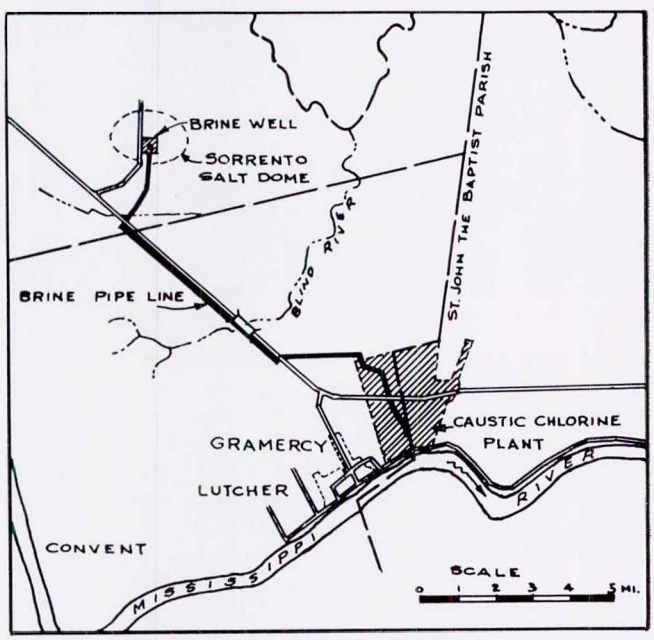
In addition to the three strings of cemented casing, a 10¾" casing was run to a depth of 4951 feet and a 7⅝" tubing was run to 5322 feet. These last two strings are used for removing the brine from the well.

Inject Fresh Water

Normal operation of the well consists of injecting fresh water from a nearby water well into the 7⅝" diameter tubing. The water flows back up through the salt formation to the 10¾" casing and to the surface. From the well head it flows to the brine reservoir. It is necessary to reverse the flow through the casings periodically in order to keep the casing surface clean, and to relieve gases.

The temperature of the rock salt is 160 degrees farenheit.

A 5% caustic and phosphate solution is added to the injection water stream to settle out leached calcium and magnesium, which is contained in the rock salt formation. These impurities settle out in the bottom of the cavity.



Above map shows location of pipeline which supplies brine from the Sorrento salt dome directly to the Kaiser Aluminum & Chemical Corp. caustic chlorine plant at Gramercy.

Warren M. Robbins is project engineer for the new Gramercy alumina plant of Kaiser Aluminum & Chemical Corp.

Factors Considered by Engineers

Drainage Districts of Southern La.

By WALDEMAR S. NELSON
and
FRANK W. MACDONALD

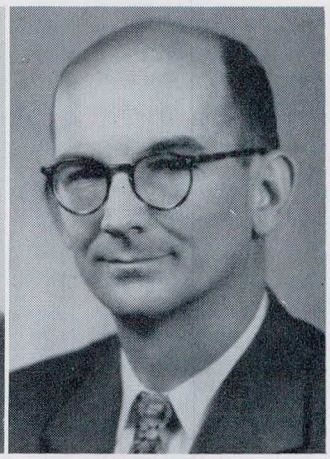
The material included in this paper is part of a report prepared by the authors on a survey of a drainage district in Southern Louisiana. This information is presented to illustrate some of the factors that may be considered by engineers in designing the facilities for drainage districts.

Southern Louisiana in years past, to a very large extent consisted of swamps and river overflow lands. The surfaces of the land in the marsh areas that are first reclaimed consist of decayed vegetation of hundreds of years of accumulation. This material is known as muck or humus and varies in depth from a few inches to several feet. Beneath this layer of muck an impervious stratum of clay subsoil is usually found.

Those areas adjacent to streams and subject to flooding are known as alluvial lands. The silt carried by the rivers has deposited along these sections so that in some localities the elevation of the ground surface has been built up to a considerable extent. In these sections the alluvial deposits overlay strata of muck and usually there is no evidence of the humus at the ground surface.



F. W. MACDONALD



W. S. NELSON

Dr. Macdonald is a professor of sanitary engineering at Tulane University and lecturer on public health problems in the medical school, having B. E. and M. S. degrees in Civil Engineering from Tulane. He is a past President of the Louisiana Engineering Society and a consultant with Bedell & Nelson Engineers, Inc.

Waldemar S. Nelson is President of Bedell & Nelson Engineers, Incorporated, a past President of the Louisiana Engineering Society, and has had some 25 years experience in drainage districts, pumping plants, and other drainage projects in Louisiana.—Ed. Note.

Along the alluvial plains in Southern Louisiana the slope of the ground surface is from the banks of the stream, dropping off to the swamps and bayous located at a farther distance.

Reclamation of swamp lands results in considerable subsidence in the ground elevation. The establishment of drainage systems causes a gradual lowering of the water table and with the removal of water from humus material, the drying effect causes a shrinkage of the soil. Removal of the water from the muck also results in an acceleration of the decomposition of the vegetable matter, further reducing the volume of the material. The shrinkage of the upper stratum in reclaimed marsh land may be as much as sixty per cent of the volume thus reducing the ground surface by considerable amounts.

Cites Usual Practice

The drainage districts in Southern Louisiana in general have outlets consisting of canals and bayous leading into the Gulf of Mexico. The usual practice is to enclose the district with levees and to pump the water from within the area into these canals and bayous. The reclamation of the wet lands through the establishment of drainage districts began in Louisiana around 1907. As Louisiana is approximately 35 per cent swamp and marsh lands, there are many such drainage districts located throughout the State.

Act No. 85 of 1921 of the Louisiana Legislature authorizes Parishes to create drainage districts for the purposes of draining and reclaiming marsh, swamp and overflow lands in the State. The Act has been amended on several occasions. It enables Parishes on their own initiative to establish drainage districts embracing all or part of the lands in their Parishes. The drainage district so formed must be with the approval of the State Departmen of Public Works. This Department is charged with the responsibility of examining the plans and approving the formation of the District being considered.

Explains Organization

The drainage districts are controlled by five commissioners known as a Board. These commissioners are appointed by the Parish Police Jury. Districts have the power to levy a uniform acreage tax to provide funds for operational purposes.

Levees — The drainage districts in Louisiana are usually entirely surrounded by levees. These levees are provided to prevent flooding of the districts from rivers and high tides of the Gulf of Mexico and its tributary canals and bayous. Protective levees range in height for the various districts from 3 to 10 feet. Exhibit No. 1 shows a tabulation by Okey[1] of the original height of levees of various districts in Southern Louisiana. Subsidence and shrinkage of levees built in marsh land areas may be considerable and in some cases as much as 50 per cent. Because of the subsidence of the levees built on these unstable soils, the heights are usually limited to a few feet in order

to reduce the weight to a minimum. This restriction necessitates considerable maintenance in order to hold the levee system to the required elevation.

Serve Dual Purpose

Ditches and Canals — Most of the ditches making up the drainage system of the early districts of Louisiana comprised from two to four per cent of the total area. The spacing of the ditches depended on the use of the land and the degree of drainage required. The canals of the drainage districts serve a dual purpose: (a) to be used as reservoirs for storage of water, and (b) to carry the water from the ditches to the pumping plant.

The canals provide a means of storing large quantities of run-off thereby permitting less frequent operation in dry weather periods. By keeping the levels of water low in these canals a large reservoir is thereby available during storms to permit the operation of the pumping station at discharge rates less than the flow rates provided by heavy storms.

The reservoir canals act as cushions between the areas to be drained and the pumping station so that the water falling during a storm can be pumped out of the district

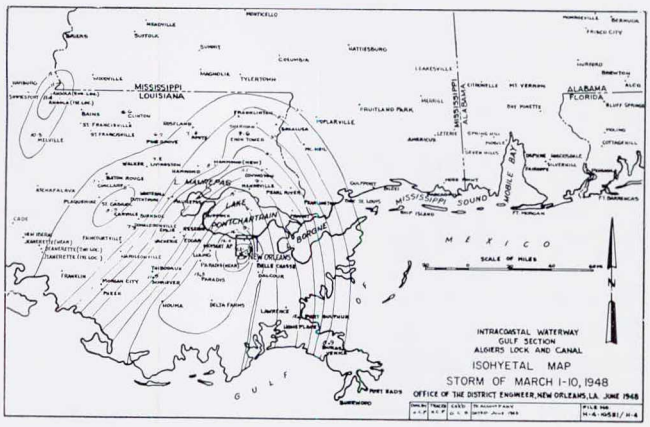


Exhibit No. 3

Probable Run-off composite of eight districts from report by C. W. Okey on the wet lands of southern Louisiana and their drainage.
STATION: NEW ORLEANS, WB CITY, LOUISIANA
Drainage basin: Mississippi **County: Orleans**
Lat. 29°57'N Long 90°04'W **Elev. (ft.) 8**
Period of record: 1889-1950

over a long period of time. It may be noted from Exhibit No. 1 that some of the early drainage districts were provided with canal systems comprising from 0.5 to 3.8 per cent of the total areas; also, the storage capacity of those canals ranged from 0.28 to 2.20 inches of water collected from the entire area. An analysis of these results will show that 0.66 inches is the median figure of those reservoir capacities listed.

Piling-Up Effect

Most of the drainage districts of Southern Louisiana consists of land that is relatively flat. Those areas that are located near rivers or bayous that overflowed in former years, slope downward from the streams to the marsh lands. Because of the flatness of the lands in the drainage districts, flow in the canals is accomplished through a piling-up effect of the water at the upper end of the channel, or through a lowering of the water level by the action of the pumps at the lower end.

[1]The Wet Lands of Southern Louisiana and Their Drainage, Charles W. Okey, Bulletin 652 U. S. Department of Agriculture, June 6, 1918.

The canals are designed to carry the water at a sufficient velocity in order to prevent depositions of silt and to maintain an adequate supply to the pumps. The velocity should not be too rapid so as to cause erosion of the banks. It is the customary practice to maintain a velocity of approximately 1.5 feet per second in canal systems.

The depths of the canals should be great enough to provide adequate reservoir capacity and to prevent the adjacent lands from being water-logged. It is desirable to increase the depths of the canals as they approach the pumping station with the bottom slope approximately equal to the slope of the surface of the water. A water depth of at least one to two feet is needed in order to prevent the growth of aquatic vegetation in the canals.

Reviews Capacities

Pumping Plant—The pumping plants are located at the lower end of the canal system of the drainage district. They must have capacities sufficient to discharge the maximum run-off of the district less the amount of water stored in the canal system. The size will be governed by the rainfall on the area and the type of land to be drained. In urban areas the quantity of run-off will be much greater than that in wood lands and agricultural sections of rural areas.

In his survey of drainage districts in Louisiana, W. B. Gregory[1] states that the pumping capacity of the areas considered were designed for run-offs of from 0.9 to 1.51 inches per 24 hours on agricultural lands. A run-off of one inch per 24 hours from one acre is equivalent to

(See Drainage, Page 17)

Period of record : 1889 - 1950

Month		Duration (hours)					
		1	2	3	6	12	24
Jan.	Amt.	2.34	3.01	3.23	3.34	3.67	4.24
	Date	22/1923	22/1923	22/1923	22/1923	7-8/1895	1-2/1936
Feb.	Amt.	1.76	2.59	3.04	4.16	5.25	6.11
	Date	13/1927	13/1903	13/1903	15/1942	15/1942	15/1942
Mar.	Amt.	2.86	4.70	6.05	7.73	9.32	10.93
	Date	26/1946	14/1903	14/1903	14/1903	5/1948	5-6/1948
Apr.	Amt.	3.66	5.28	6.54	7.95	12.76	14.01
	Date	9/1920	15-16/1927	15-16/1927	15-16/1927	15-16/1927	15-16/1927
May	Amt.	2.87	3.59	5.39	6.57	6.95	9.08
	Date	10/1912	10/1912	2/1926	2/1926	2/1926	2-3/1926
Jun.	Amt.	3.45	4.53	4.67	4.78	5.09	6.64
	Date	22/1942	22/1942	22/1942	22/1942	8/1941	21-22/1942
Jul.	Amt.	2.79	3.38	3.38	3.38	3.78	5.50
	Date	26/1942	26/1942	26/1942	26/1942	14-15/1931	14-15/1931
Aug.	Amt.	2.43	3.27	3.39	3.62	5.26	5.30
	Date	7/1937	30/1930	30/1930	30/1930	30/1930	30/1930
Sep.	Amt.	3.18	5.71	6.21	8.62	10.10	10.75
	Date	7/1929	7/1929	7/1929	6-7/1929	6-7/1929	6-7/1929
Oct.	Amt.	2.73	3.80	4.75	6.89	10.86	13.68
	Date	29/1918	29/1918	2/1937	2/1937	1-2/1937	1-2/1937
Nov.	Amt.	2.26	3.13	3.31	3.54	3.59	6.26
	Date	8/1944	8/1944	8/1944	8/1944	25-26/1944	25-26/1944
Dec.	Amt.	2.16	2.32	2.38	3.40	4.27	4.83
	Date	25/1916	25/1916	25/1916	27-28/1905	27-28/1905	19-20/1918
Annual	Amt.	3.66	5.71	6.54	8.62	12.76	14.01
	Date	4/9/20	9/7/29	4/15-16/27	9/6-7/29	4/15-16/27	4/15-16/27

EXHIBIT No. 5

Maximum precipitation for 1, 2, 3, 6, 12 and 24 hours
City of New Orleans
From reports of U. S. Weather Bureau
Department of the Army **Corps of Engineers**
Appendix I Plate 4

Medalist — Field Notes By Allen Johnson

DR. C. H. FISHER, New Orleans, director of the U. S. Department of Agriculture Department's Southern Utilization Research and Development Division (and an LES member) has been named recipient of the 1959 Herty Medal of the Georgia Section of the American Chemical Society. The award, established in 1933, is given annually in recognition of outstanding contributions to chemistry in the South. Dr. Fisher guides the Southern Regional Research Laboratory in New Orleans.

THE INNER HARBOR Navigation Bridge at N. Claiborne Avenue, New Orleans, received an award in the 30th annual Aesthetic Bridge competition sponsored by the American Institute of Steel Construction . . . The span was fabricated by U. S. Steel's American Bridge Division for Boh Brothers Construction Co., general contractor on the project for the La. State Highways Dept. . . . The award was presented at the May meeting of the Baton Rouge Section, LES . . . Citations were received for the State Highways Dept. by chief engineer E. J. James, and assistant bridge design engineer Louis Duclos, in charge of designing the structure.

ARIZONA CHEMICAL Company plans to build a tall oil refinery in Springhill, La., said J. H. Ruskin, president . . . A new landing is contemplated in Mobile, Ala., by McDonough Marine Corp., with facilities on the Industrial Canal in New Orleans, Harvey Canal in New Orleans, Morgan City, La., Houston, and Intracoastal City, Tex., according to V. I. Landrum, vice-president . . . R. Nelson Crews has been named vice-president of J. Ray McDermott Co., Inc. The Tulane engineering graduate joined the firm upon graduation in 1948 and has been chief engineer since December, 1953.

Industrial Electric, Inc. of New Orleans, this month celebrates its 30th year under E. M. Brignac, Sr., manufacturing neon signs, porcelain enamel, illuminated plastic signs, panelboards and repairing electric motors.

William H. Rhodes, an LES past president, assumes duties as editor of the Louisiana Engineer, succeeding the highly capable Chester A. Peyronnin, Jr. . . . Another LES past president, Clayton L. Nairne, was elected executive vice-president of New Orleans Public Service Inc. . . . Paul F. Hoots, Sr., an LES member was elected a NOPSI vice-president.

Kennedy-Ervin Bill

The Kennedy-Ervin labor reform bill has received approval from the full Senate Labor Committee by a vote of 13 to 2, after extended discussion and deliberations.

Basic Science Research Stimulus

Rep. Overton Brooks of Louisiana, chairman of the House Committee on Science and Astronautics, has introduced two measures designed to stimulate and expand basic and supporting scientific research. The first proposal would exempt from gross income any amount received under a contract with a federal agency for the conduct of basic or supporting research or both. The second provides that in any research and development contract entered into by a federal agency in an amount of $100,000 or more there would be provided an additional amount equal to 10 per cent of the total contract price so that the contractor could conduct basic and supporting research in the general area of activities bearing a reasonable relation to the main contract.

Increase In Per Diem

An increase in the maximum allowable per diem rate to $100 for the intermittent services of professional consultants has been recommended recently by NSPE to the House and Senate Appropriations Committees.

Engineer Postage Stamp

Sen. Jacob K. Javits and Rep. Dean Taylor, both of New York, have introduced identical bills providing for the issuance of a postage stamp in commemoration of the 125th anniversary of the granting of the first degrees in engineering and science awarded in any English-speaking country. The degrees were granted at Rensselaer Polytechnic Institute, Troy, N. Y.

Program For Students

The National Science Foundation has announced plans for a major effort this summer to interest talented high school students in engineering and scientific careers. The Foundation will sponsor special summer training programs for the selected students at 105 colleges, universities and research institutions.

Taxes On Moving Costs

Rep. Hale Boggs of Louisiana has introduced legislation to offset a recent court ruling that moving expenses paid new employees constitutes income upon which federal income tax must be paid. Although not limited to engineering employees, the bill is an outgrowth of a test case brought by engineering employees who were required to pay income taxes on the amount of their moving expenses.

Professional Engineers Granted Registration

APRIL 14, 1959—Fred W. Bates, Lafayette; Fred Bell, Jr., Baton Rouge; John C. Broom, Lafayette; Clinton E. Calvert, Beaumont, Tex.; Romulo R. Campos, Baton Rouge; Paul R. Courrege, Baton Rouge; Harrison E. Fischer, Beaumont, Tex.; Robert D. Franklin, Bossier City; Lewis Gartrell, Little Rock, Ark.; Sidney L. Gelpi, Jr., New Orleans; Willard M. Hanks, Baton Rouge; Walter H. Harris, Port Sulphur; Kenneth D. Hightower, Shreveport; Gilbert W. Hiter, Panama City, Fla.; Rolla R. Jefferson, Bossier City; Leander L. Keller, Jr., Gonzales; Charles A. Kelly, Mobile, Ala.; Paul T. Kyler, Tyler, Tex.; William P. Lamfers, Mobile, Ala.; Francis N. LeBlanc, Broussard; Charles R. Long, Atlanta, Ga.; Walter S. Mask, New Orleans; Charles R. Long, Atlanta, Ga.; Walter S. Mask, New Orleans; Stuart McCardle, Metairie; Joseph A. Nadler, Jr., Thibodaux; Robert P. Naremore, Shreveport; Joseph F. Neucere, Baton Rouge; Oscar J. Palmer, New Orleans; Denver S. Patton, Jr., Shreveport; Farrell Perdreauville, Orange, Tex.; Houston L. Pittman, Bogalusa; Clifford W. Rackley, New Orleans; Martin W. Reynolds, New Orleans; Commie W. Ribbsgee, Bossier City; Thomas B. Romine, Pr., Ft. Worth, Tex.; Billy C. Tharp, Monroe; James G. Sheridan, New Iberia; Austin B. Smith, Vicksburg, Miss.; Curtiss N. Stuart, Shreveport; Leo A. Stubbs, New Orleans; Arthur E. Uhl, Lafayette; James R. E. Willis, St. Martinville.

MAY 12, 1959—Thomas S. Barth, Jackson, Miss.; James A. Beach, New Iberia; Elton G. Breaux, Duson; Bert R. Chenault, Houston, Tex.; Allan B. Cole, New Orleans; Charles A. Copes, Baton Rouge; Ronney B. Daigre, Bogalusa; William H. Ditto, Golden Meadow; Richard A. Dupuis, Lafayette; Charles V. Flint, Owensboro, Ky.; Joseph B. Fournet, Lafayette; Charles M. Frenz, Lake Charles; Robert J. Gary, Dallas, Tex.; Harry A. Gibson, Little Rock, Ark.; LeRoy F. Good, Port Sulphur; John H. Gullatt, Ruston; Arthur S. Huey, Jr., New Orleans; William J. Hughes, Baton Rouge; John W. Jenkins, Shreveport; Willie L. Landon, Jr., Sherard, Miss.; Dan A. Lawson, Metairie; Samuel I. Lipka, Little Rock, Ark.; Walter R. Lobdell, Lake Charles; James D. Major, Metairie; Kedwick R. Martin, Monroe; Don M. Mayer, Metairie; Lewis E. Miremont, Baton Rouge; Harry B. Owens, Jr., Lafayette; Albert Pecker, Norco; James C. Pennington, New Orleans; Berton J. Perry, Baton Rouge; Emil H. Praeger, Brooklyn, N. Y.; Otto Prochaska, Jr., Baton Rouge; Richard T. Roach, Jefferson Parish; Francis M. Roberts, Campti; Walter C. Robertson, Sr., Shreveport; J. W. Stubblefield, Jr., Bogalusa; William Sturm, St. Paul, Minn.; James S. K. Tam, Cambridge, Mass.; Percy N. Vinther, Dallas, Tex.; Maurice W. Wasson, Westlake; Richard G. Wilson, Lafayette; Rex V. Wilson, Metairie; Jack T. Wooten, Creve Coeur, Missouri.

JUNE 3, 1959—John L. Bankston, Jr., Baton Rouge; Leroy E. Bidwell, Jr., New Orleans; Leo F. Flotron, New Orleans; Henry G. Gerstner, Gramercy; Albert F. Landers, New Orleans; Marvin R. McCarty, Baton Rouge; Alexander Mitchell, Baton Rouge; Thomas G. Narum, Metairie; Willie R. Southern, Seminole, Okla.; Roland A. Sturdivant, Jr., New Orleans; William E. Thompson, Metairie; Valerian Villanyl-Hausner, New Orleans.

JUNE 3, 1959 (LAND SURVEYORS)—Alton F. Anderson, Lake Charles; Charles L. Besson, Jr., Pineville; James D. Grant, New Orleans; Darrell D. Shine, Silsbee, Tex.; Charles W. Woolford, Lafayette.

Phone Magic Links Engineers' Confab

Telephone magic brought the voice of Dr. Clark A. Dunn, national president, National Society of Professional Engineers, from Madison, Wis., to the May meeting of the Shreveport Section, Louisiana Engineering Society.

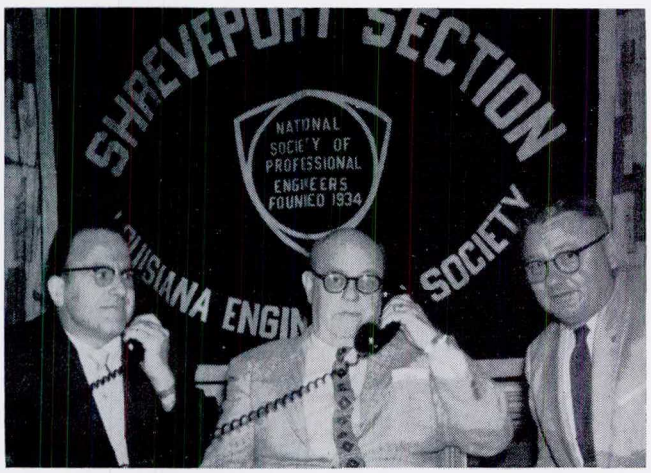
Dr. Dunn, Dean of the Engineering Research Department of Oklahoma State University, spoke long-distance from Madison where he was visiting. His answers to questions about NSPE objectives were amplified to the Shreveport Section in a program arranged by Mr. Dean Garner, Manager of the Shreveport District, and Mr. Charles Wright, of the Engineering Department of the Southern Bell Telephone & Telegraph Company.

Shreveport moderator E. M. Freeman, a past national director of NSPE, asked Dr. Dunn to list the main accomplishments of NSPE during his administration and to outline present and future aims of the organization.

The NSPE chief excutive noted that four new states — Alaska, Hawaii, Maine and Oregon — had affiliated with NSPE, thus materially increasing its membership, and that $65,000 had been raised to continue its work effectively.

Present plans call for continuation of membership drives and training in professional objectiveness; another aim: continuing efforts to establish a coordinated professional engineering unit for the entire engineering profession, Dr. Dunn said.

He recalled a Louisiana visit last year when he presented a charter of LES affiliation with the NSPE. About 45 members—a third of the total membership—attended the noon session in the Caddo Hotel.



Chatting with NSPE President Dr. Clark A. Dunn long-distance during a program of the Shreveport Section of the LES are (from left), Q. W. Hargrove, section president, and E. M. Freeman, LES past president and past national director of NSPE. Listening in is section vice-president O. T. Ice, Jr.

Maintenance in the Round

Union Tank Car Uses Radial Plant

BY KENNETH B. GAIR

A huge golden dome rising from the earth just north of Baton Rouge may be the forerunner of a new type of industrial structure that will make the traditional factory building as obsolete as running boards on automobiles.



Kenneth B. Gair
. . . a golden dome

Built by Union Tank Car Company of Chicago as a regional tank car repair facility, the Union Dome, the world's largest geodesic-type structure, comprises a group of elements sought by any industrialist planning a new building.

These include economy of cost per square foot of floor space covered; visual control of all work areas from one central point; unimpeded materials and work flow; flexibility of work space; concentration of activity in a compact circular layout; ease of heating, cooling, lighting and ventilation; speed of erection; low upkeep costs; reduced risk of obsolescence; and ability to be built on virtually every type of soil.

For inspection, repair and maintenance of its tank car fleet, Union Tank maintains 11 major service centers in the U. S. and four in Canada, in addition to eight minor repair points. The operation constitutes the biggest single expenditure in Union Tank's tank car leasing operations. Because of this, the need for their efficient operation presents a never-ending challenge to the company. To this end the company has responded with a fundamentally new radial plant layout and, in housing it, has become the first major user of a radial building structure.

Intricate Switching

The entire plant design evolved from problems inherent in tank cars and in previous plant layouts. The cars can, of course, be moved only on rails and then only in two directions, backward or forward. Thus, in the traditional straight line repair shop, the car requiring the most repair work dictates the speed of the entire line. Intricate switching apparatus helps, but does not eliminate the problem.

To solve it, Union Tank adapted a circular, or radial, system in which each car is spotted in any repair area independently of all other cars and can be moved to other areas or out of the plant independently of all other cars. The arrangement is like a gigantic wheel.

The hub is a separate structure 90 feet high and 100 feet in diameter. The ground floor of the hub is the materials storage area. Above it are administrative offices and employees' quarters. At the top is a central control tower from which all operations below can be observed. It is the nerve center of the operation.

Sweeping a circular path 50 feet wide completely around the center structure is a Whiting transfer table. Radiating from the circumference of this path are 36 sets of railroad tracks. Thirty of these are repair posts. Three are entrances to the dome and three are exit tracks.

The radial arrangement brings every repair area, totaling nearly half a mile of repair track, to within 50 feet of the storage area. Thus materials handling costs and delivery time are cut by a substantial percentage.

A fundamental point in the design concept is the eccentric location of the hub. It is off-center within the perimeter of the dome by 25 feet. This provides larger areas behind the heavy service positions for special facilities. Here are located the woodworking, machine, blacksmith, welding and wheel shops, along with the air compressor, boiler room and waste renovation plant.

With the radial shop arrangement conceived, the problem remained of how to encase it. The final solution was, of course, the Union Dome. It is the first major industrial application of the geodesic principle of design. Widely publicised now, it is based on patents for a geodesic home held by R. Buckminster Fuller, who designed the Dew Line domes of the U. S. Arctic radar warning system.

The dome rises 120 feet, is 384 feet in diameter at its base and has no internal supports. It covers 110,000 square feet of unimpeded floor space. The dome consists of 321 hexagonal steel panels welded together and

(See Dome, Page 19)

Mr. Gair is plant manager of the Union Tank Car Co. in Baton Rouge. The article printed here is summarized by him from a talk he delivered recently before the Louisiana Section of the American Society of Civil Engineers in New Orleans. Mr. Gair is a member of the ASME.

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An Outline of the History

Engineer Registration in Louisiana

By DR. DONALD DERICKSON

So much has been said and written about Engineering Registration, and well written and well said, that it has become a hardy perennial. Time and again articles have appeared in the publications of the national engineering organizations, as well as those of our own Louisiana Engineering Society, so it would seem that there is no occasion for anything further on the subject.



DR. DONALD DERICKSON
. . . registration grows

However, each year there is an ever increasing number of registrants, young graduates and others, who are not informed as to the meaning of, or the reasons for, the law with which they are complying, perforce of necessity, before they may legally engage in professional engineering practice.

Accordingly it is advisable, in the opinion of the Louisiana State Board of Registration for Professional Engineers and Land Surveyors, that those concerned should be informed, and in cooperation with our Society it brings to the attention of all those interested who care to read, a brief resume of the beginning and development of the laws regulating the practice of professional engineering in general and particularly in Louisiana.

Enact Louisiana Law

Wyoming was the first State to enact a law regulating the practice of engineering in 1907. Shortly thereafter, the Louisiana Legislature passed Act 308 of 1908 which became the law regulating the practice of Civil Engineering and creating the Louisiana State Board of Engineering Examiners. This was at the request of our Society. Conversation with some of those who constituted the group of Civil Engineers who were instrumental in securing the passage of this Act proved interesting, and leads to an understanding that it was a case of *caveat emptor*, that the public safety was endangered by the practice of unqualified and sometimes unscrupulous persons, and that such a law was essential and badly needed. This condition existed in other states and as the need of regulation became apparent regulatory laws were passed.

A chart showing the progressive history of engineering registration in all the States and Territories of the Nation appeared in the Proceedings of the National Council of State Boards of Engineering Examiners for the year 1953-54. A study of this chart reveals the slow growth of registration from its beginning in 1907 to 1919, the rapid increase during the next three years, and the more or less constant increase from 1921 to 1950 when the District of Columbia adopted its law regulating the practice of professional engineering.

Need Realized

The slow growth during the first eight years is indicative of the obstacles which had to be overcome and the opposition encountered; then the rapid increase to the inclusion of all of the States and Territories by 1950 shows the realization of the need of such legislation and the safeguard provided thereby. The very fact that all of our States and Territories as well as the Provinces of Canada have such laws is incontrovertible evidence that public safety demands them. Another chart from the 1958-59 Edition of the NCSBEE Year Book shows the accession, i.e., the yearly increase in the registrations,

Dr. Donald Derickson is Chairman of the Louisiana Board. His years of service as a member of a Registration Board exceeded those of any other man in the S. S. In this article Dr. Derickson has not given himself credit for much of the early pioneering work done in the establishment of the registration movement and in his early work with the Engineers' Council Professional Development.—Ed. Note.

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the total number of engineers registered being 225,284 as of June, 1958. The upward slope of the curve indicates a rate of increase of some 10,000 registrants per year. Together these two charts convey more information regarding the history of engineering registration than could be conveyed by many pages of descriptive matter. However, they do not show the number, undoubtedly large, of professional engineers who are not registered; they do not show the efforts of trade unions to include engineering employees within their ranks; they do not show the beneficial effects of the Taft-Hartley Act; they do not show the revisions of the laws as time and experience made changes necessary or desirable; they do not show the attempts to weaken these laws so as to admit to registration those who could not or would not meet the minimum requirements; nor do they show many other factors, far too many to be mentioned here, all of which point to the need of continued vigilance that the public safety be not endangered by the lowering of the minimum requirements for registration as professional engineers.

Improve Statute

Here in Louisiana the original Act 308 of 1908 underwent three changes: At first, written examinations were required of all applicants except those holding the advanced degree in Civil Engineering from Tulane or the Louisiana State University. It was liberalized in 1920 to the extent of granting registartion to the graduates of Civil Engineering curricula which were approved by the Board. There was no Engineers' Council for Professional Development list of accredited curricula until 1932 so for 12 years the Board used its own criterion of a satisfactory course. Some of the curricula did not measure up to the Board's requirements but later were made satisfactory, thus from that standpoint good was accomplished.

In 1941 the Board was incorporated into the State Department of Occupational standards and moved to the Capitol at Baton Rouge where it was well treated and enjoyed certain facilities then not otherwise available.

However, the Professional Engineers disliked the idea of its Board of Examiners being grouped with the trades and crafts so after a stay of 19 months it was returned to New Orleans where through the kindness of President Harris of Tulane University and Deans Robert and Johnson of the School of Engineering it has remained and enjoyed free-of-charge office space and the facilities of the University.

Expand Approach

The Louisiana State Board of Engineering Examiners was terminated in 1950 by a new law creating another Board of Registration embracing in addition to Civil Engineering other branches of the profession. During the existence of the Board thus ended, two developments took place which were important in their effect on engineering registration throughout the nation. One was the founding of the National Council of State Boards of Engineering Examiners in 1920. The late Colonel Marcel Garsaud, at that time a member of the Louisiana Board, was active in its formation and served as its first president. The NCSBEE represents a community of interest and has been effective in many ways in the improvement of affairs relating to engineering registration, particularly in simplifying Inter-State practice. Any reference to the NCSBEE should include mention of its Executive Secretary, Mr. T. Keith Legaré, who has rendered such distinguished service through the years in connection with engineering registration.

Council Formed

The other was the formation in 1932 of the Engineers' Council for Professional Development consisting of representatives of the various National Engineering Societies and allied organizations.

Among its activities was and is a continuing and thorough inspection of the curricula offered by the engineering departments of the colleges and universities from which has resulted a list of educational institutions the engineering curricula of which are regarded as satisfactory and are accredited.

This research in engineering education has been and is of great value as it is of material assistance to the State Boards in the evaluation of applicants for registration. A member of the Louisiana Board served for several years as a regional delegate representing the American Society of Civil Engineers and the National Council of State Boards of Engineering Examiners in connection with inspections.

The original appointees to the old Board were pioneers in the field of their activities and it can be said of them and their successors that they did their best with what they had in view of the limitations of the law under which they served and the financial resources at their disposal. They contributed greatly to the cause of registration during a formative period.

Regulatory Law

It was recognized by members of the profession that public safety required a regulatory law with respect to

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other divisions of professional engineering as well as Civil Engineering. The Louisiana Engineering Society in 1950 under the presidency of Mr. Lionel J. Cucullu was successful in securing the passage of Act 73 of 1950 which became effective on June 30 of that year. This is an easy thing to say but it was a hard thing to get.

Only through the repeated, persistent and indefatigable efforts of a group among whom were Mr. James M. Todd, later president of the American Society of Mechanical Engineers, Major General Edward S. Bres (retired), U.S.A., who had served as a member of the old Board, and others was the objective accomplished.

Thus, it is seen that when sustained effort occurs by a unification of the various branches of professional engineering groups, such are represented in the membership of the Louisiana Engineering Society, on behalf of public safety, satisfactory results are to be expected.

All professional engineers registered under Act 73 of 1950 creating the Louisiana State Board of Registration for Professional Engineers and Land Surveyors have received or have had access to a copy of the law under which the present Board operates (a copy can be obtained free of charge from the Board office) and they are expected to be familiar with its requirements so only some of the salient features of this law will be mentioned here for the benefit of those interested but not yet registered.

Salient Features

The Board is composed of seven members from different sections of the State. Eight divisions of engineering, i.e., Agricultural, Chemical, Civil, Electrical, Mechanical, Metallurgical, Mining and Petroleum are designated in the Act. There are four ways by which an applicant can become registered.

Graduation from an engineering curriculum approved by the Board, by examination, on the basis of long established practice and by reciprocity under certain conditions with other States.

Also provision is made for Temporary Practice for non-residents under specific conditions. Apparently provision is made for registration of any person who can meet the requirements as specified by law who may fall under any of these classifications. This is a broad coverage and the conditions and requirements to be met are a minimum compared with the standards of the profession and the demands of public safety. In fact some of the requirements are lower than those prevalent in other States. All applicants for registration on the basis of graduation with less than four years of experience are required to appear before a Board member for interview.

One-Day Examination

All applicants for registration as Land Surveyors are required to pass an examination lasting one day and to have not less than six years of experience satisfactory to the Board, and to be interviewed before taking the examination.

It is pointed out that the law charges the Board with enforcement of the law as well as its administration. The Board considers the complaints which are brought to its attention and if warranted investigates. Should the complaint be well founded it will take such action as it feels proper and in conformity with the law. In this respect it is guided by the recommendations of the Board's Attorney that its actions may be sustained by the Court. It would help if the complaints were specific in their nature.

Ruling of Court

The following is the pronouncement of a learned Louisiana judge in addressing an individual brought into Court by action of this Board. It is significant and given here than an applicant for registration may realize that professional engineering is a learned profession.

"In reprimanding one of the defendants, the Court stated that laws governing the practice of professional persons are essential to a community to insure that competent individuals will serve the public. The engineering profession is an old established field of practice and as in the case of similar groups such as the medical and legal professions, it should be safeguarded against the acts of unscrupulous persons. It is right and proper that persons who possess the qualifications to do so hold registration as Professional Engineers and that unqualified persons who persist in practicing the profession without license are guilty of a misdemeanor."

After nine years of experience with the present law it is only reasonable to expect that some, in this instance few, changes are desirable that our law may be brought up to the level of the laws of other States. However they will not be gone into here.

Recites Section

Lest it be forgotten, it is well to read again Section 1, General Provisions, of Act 73 of 1950 which is here given:

"Be it enacted by the Legislature of the State of Louisiana that, in order to safeguard life, health and property, and to promote the public welfare, any person in either public or private capacity practicing or offering to practice professional engineering or land surveying, shall hereafter be required to submit evidence that he is qualified so to practice and shall be registered as hereinafter provided; and it shall be unlawful:

(1) For any person to practice or to offer to practice in this State, engineering or land surveying, as defined in the provisions of this Act. or to use in connection with his name or otherwise assume, use or advertise any title or description tending to convey the impression that he is a professional engineer or a land surveyor, unless such person has been duly registered under the provisions of this Act."

It should be clear in the minds of the informed that any attempt to weaken the law or to circumvent any of its requirements is inimical to the public welfare.

The 1959 Year Book of the Board lists 4190 professional engineers as having met the requirements for registration. This number is increasing at the rate of 10 per cent per year. The magazine, THE LOUISIANA ENGINEER, will go to all of these professional engineers, the membership of our Society, the members of our Legislature and others. It is hoped that in some small way this outline of engineering registration in Louisiana and the nation will assist in an understanding of the importance of maintaining the requirements of our registration law and a resistance to its impairment. The continuing increase in engineering registration is indicative of the industrial development of our State; this combined with the demands of a complex and changing civilization makes necessary, as never before, compliance with the Louisiana Law.

Drainage

(Continued from Page 9)

0.042 cubic foot per second. Okey in his study of thirty (30) drainage districts of Southern Louisiana found that most of the plants were designed for capacities from 1.0 to 1.50 inches run-off per twenty-four hours. A summary of the figures compiled in thirty districts is shown in Exhibit No. 1. In reviewing the records of rainfall and run-off from four drainage districts of Louisiana he states as follows: "In the year 1914 the results from the Poydras, Des Allemands, Jefferson and Raceland plants may be said to be typical. In addition the results from the last named district for 1913 are also typical.

Charts Rain

"An average of the records for 1914 for each of the districts and including the records for 1913 from the Raceland district, gives the following results:

Rainfall	50.85"
Run-off	22.59"
Days per year on which operation occurred	104
Number of times per year boilers were fired	97
Number of 24-hour days per year at full capacity	21.1
Average number of hours run at full capacity per fire up	5.2

"While the above rainfall is slightly below normal for this section of the State, it is believed that the percentage of rainfall appearing in run-off in the above average will not be far from normal. With the mean annual rainfall of 56 inches and the same percentage, the amount to be pumped would be 25 inches per year. Therefore, a plant with twenty-four-hour capacity of 1.25 inches in depth of water over the area drained would have to operate an average of about twenty days of twenty-four hours each."

Most of the drainage pumping stations in Southern Louisiana are equipped with the low lift pumps operating under head from 0 to 10 feet. A few use centrifugal pumps but the majority have horizontal screw pumps which are adaptable to discharging large quantities under low heads with a high degree of efficiency.

Tropical In Character

Rainfall—The survey area under consideration is in a section subjected to some of the heaviest rainfalls experienced anywhere in the United States. The precipitation is generally tropical in character particularly in the summer when storms of extreme intensity are likely to occur. Exhibit No. 2 shows the mean annual precipitation in the United States. It may be noted that the rainfall in Southern Louisiana ranges from 50 to 60 inches per year, the greatest precipitate east of the Rockies. It is exceeded in quantity only by those areas along the Pacific Coast in the extreme northwestern United States.

Tropical storms in summer periods are often of great intensities but often may vary greatly in areas nearby. Gauges a short distance apart are likely to give readings of considerable variation on a monthly basis but yet the annual totals will show comparable results. As an illustration of this the following is a tabulation of the readings of the seven gauges of the New Orleans Sewerage and Water Board for the month of August 1952:

Date Aug. 1952	Dublin	Park	Jefferson	Hall	Algiers	London	Jourdan
1	-----	0.01	0.08	0.01	0.29	-----	0.01
4	0.07	0.19	0.04	-----	-----	-----	-----
6	-----	-----	-----	-----	-----	0.24	0.87
8	-----	0.56	0.76	0.69	0.22	0.04	0.01
10	----)	-----	0.48	-----	0.04	-----	0.04
11	-----	0.12	-----	-----	-----	0.08	-----
12	0.23	0.27	0.03	0.11	0.02	0.04	-----
13	-----	0.84	1.85	0.51	1.31	0.01	0.54
16	-----	-----	-----	-----	0.06	-----	0.81
17	-----	0.03	-----	-----	-----	-----	-----
18	0.04	0.64	1.70	0.81	1.29	1.00	1.80
20	0.14	0.17	0.07	-----	0.05	-----	0.14
21	0.80	0.42	0.53	0.25	0.07	0.63	0.07
26	0.01	0.01	0.02	0.05	0.05	0.02	0.12
31	0.02	0.61	0.24	0.51	0.42	0.38	0.49
Totals	1.31	3.87	5.80	2.94	3.82	2.44	4.90

Irregular Pattern

It may be noted from the above that a very irregular pattern of rainfall was recorded during the month at these seven stations. For example on August 8, 1952, no rain was recorded at the Dublin Station yet over a half-inch fell at three other stations. Likewise on August 18 only 0.04 fell at the Dublin Station but 1.80 inches was recorded at the Jourdan Station and 1.70 at the Jefferson.

On August 21 the conditions were reversed and Dublin recorded a precipitation of 0.80, the maximum for the day of all the stations, with a minimum of 0.07 inches for two other stations. The monthly totals show the Dublin Station to have the minimum value of 1.31 inches with Jefferson recording more than four times the amount with a value of 5.80 inches.

These results are typical of the summer rainfalls in tropical climates. Although the heaviest rainfalls are recorded by months in the summer periods, the totals are usually distributed over a greater number of days per month and consequently the runoffs during these periods are not as large.

Although the annual rainfall in Southern Louisiana is large, of greater importance in the design and operations of drainage districts are the storms of high intensity occurring in short periods of time. The large rainfalls in the summer months are usually localized covering small areas. These rains are likely to be well dispersed throughout the entire month and usually permit the pumping plant sufficient time to empty the canals and drain the adjacent land. The soil also dries out more readily in the summer and the rate of evaporation is high.

These are important factors tending to minimize the drainage problems in the summer months. In the cooler periods of the year when precipitation of high intensity occur on ground that is already saturated the drainage problem becomes more acute. The rate of precipitation of storms of this character are of great importance in determining the capacity of pumps that are required to serve drainage districts.

Rate of Precipitation

The rate of precipitation has a very important bearing on the size of the pumping plant required. Where the drainage districts are predominately farm and wood lands storms of tropical character may have little effect on the pumping plant. This is particularly true in the sum-

(Exhibits Nos. 1 and 2 Available Upon Request)

[1]The evolutions of Low-Lift Pumping Plants in the Gulf Coast Country, W. B. Gregory, Reprint, Journal of American Society of Mechanical Engineers.

mer months when the ground is dry and evaporation rates are high. Rains occurring under these circumstances may furnish little flow to the pumping station. When, however, the ground surface is already wet and heavy storms occur the run-off developed under these circumstances may be of greater signifcance. The greater the impervious character of the surface, the higher run-off to be expected. Agricultural and farm lands give low run-offs whereas urban areas consisting of many paved streets and thickly built-up sections give run-offs approach total precipitation.

Storm of 1927

As an example of the heavy storms experienced in the area, the following is a tabulation of the records of an unusual rainfall experienced in the New Orleans area on April 1 and 2, 1927:

Period	Precipitation
5 Minutes	0.66 Inches
15 Minutes	1.64 Inches
30 Minutes	2.34 Inches
45 Minutes	3.00 Inches
1 Hour	3.39 Inches
2 Hours	5.28 Inches
3 Hours	6.40 Inches
4 Hours	7.34 Inches
5 Hours	7.88 Inches
19 Hours	14.01 Inches

It is fortunate that storms of this intensity occur infrequently. When they are experienced an extremely heavy burden is placed on the drainage collection system and on the pumping plant, with flooding of the area very likely to occur. Storms of this type are so intense that few drainage systems are designed to remove immediately the water deposited on the area.

Rains of 1948

A heavy rainfall of more recent origin and of great significance to the drainage area under consideration fell on March 1 to 9, 1948. The records of this storm are as follows:

	PRECIPITATION IN INCHES			
Time	U. S. Weather Bureau New Orleans	Naval Ammunition Depot	Hero Pumping Station	Drainage Station No. 8
March 1	.04	0.37	0.32	.08
March 2	2.08	1.72	1.53	1.89
March 3	2.02	1.83	2.25	1.67
March 4	0.68	0.20	0.52	0.52
March 5	9.86	4.12	14.96	7.75
March 6	1.34	4.45	3.20	1.47
March 7	T	.....	.....	.....
March 8	0.98	.04	1.75	0.90
March 9	1.63	2.01	0.87	1.37
March 10	.....	.....	.....	.....
Total	18.63	14.74	25.40	15.65

Exhibit No. 3 is an isohyetal map of the storm showing the distribution of the precipitation over the area. This storm which extended over a nine-day period resulted in considerable flooding of the area being considered in the drainage study.

Rainfalls such as those occurring in the storms of 1927 and 1948 usually result in overtaxing drainage systems in urban areas to the extent that the streets in the business and some residential areas are flooded. At the height of the storm of 1927 the precipitation was at the rate of 0.66 inches in five minutes, or an intensity of nearly 8 inches per hour. Facilities provided through modern engineering practices are usually expected to operate successfully in preventing flooding for average conidtions.

With the short time of concentration experienced in urban areas, it is considered impracticable to design a storm drainage system to accommodate rainfalls of eight inches per hour In rural areas, however, the times of concentration are greater, runoff co-efficients are much lower and greater reservoir capacities are available. Flooding of drainage districts is less likely to occur when storms of high intensities are experienced.

Gives History

Exhibit No. 4 is a tabulation of the 1, 2, 3, 6, 12 and 24-hour maximum precipitation of the U. S. Weather Bureau station for the New Orleans area. It covers the period from 1889 to 1950. It may be noted that the maximum for any 24-hour period was the 14.01 inches referred to above that occurred in April, 1927. Technical Paper No. 15, of the Weather Bureau, U. S. Department of Commerce, lists similar tabulations for over 40 cities and communities in Louisiana.

A review of the records of the New Orleans Sewerage and Water Board shows that the following storms of large proportion have been experienced since 1895 through 1954*:

Rainfall	New Orleans Sewerage and Water Board
Number of Rains exceeding 3 inches in 24 hours	90
Number of Rains exceeding 4 inches in 24 hours	52
Number of Rains exceeding 5 inches in 24 hours	27
Number of Rains exceeding 6 inches in 24 hours	15
Number of Rains exceeding 7 inches in 24 hours	8
Number of Rains exceeding 8 inches in 24 hours	7
Number of Rains exceeding 9 inches in 24 hours	4
Number of Rains exceeding 10 inches in 24 hours	2
Number of Rains exceeding 11 inches in 24 hours	1
Number of Rains exceeding 12 inches in 24 hours	1
Number of Rains exceeding 13 inches in 24 hours	1

*Records for year 1944 not available

The above tabulation of the 24-hour rainfall records of the New Orleans Sewerage and Water Board for the City of New Orleans covers a span of 59 years. They show for example that a rainfall exceeding 9 inches per 24 hours occurred four times during the period or at a probable frequency of once every 15 years. Records such as these are often valuable in analyzing rainfalls and in developing frequency charts or graphs to be used in designing drainage districts.

Probable Frequency

Exhibit No. 5 shows a probable frequency total rainfall chart for the New Orleans area. This chart prepared by the Louisiana Department of Public Works is based on a 43-year record of the rain gauge of the U. S. Weather Bureau in New Orleans. The results vary slightly from the tabulation prepared above. It may be noted for example that a storm of nine inches in 24 hours according to these charts may be expected to occur once every 20 years. "Louisiana Rainfall" published by the Louisiana Department of Public Works, lists over 20 such rainfall frequency curves for various cities in Louisiana.

Rainfalls of large proportion on drainage districts are usually disposed of without flooding, provided sufficient reservoir capacity is available in the canal system and adequate pumping facilities are available. Okey in his

(Exhibit No. 4 Available Upon Request)

analysis of the wet lands of Southern Louisiana made a study of the heavy storms and run-off factors of eight drainage districts in the area. This study comprised districts containing areas ranging from 647 to 6500 acres with pumping plants having capacities of from 0.75 to 1.70 inches per 24 hours. The following districts were included in the study:

Lafourche Drainage District No. 12—Sub-district No. 1
Lafourche Drainage District No. 12—Sub-district No. 3
New Orleans Land Company Tract
Gueydon Drainage District
Des Allemands Poldu No. 1
Jefferson Drainage District No. 3
Smithsport Planting Company Tract
Willswood Plantation

Exhibit No. 6 shows the graph prepared by Okey on his study of the 1, 2, and 3-day storms and the resulting run-off from the districts. The graph is a composite of the eight districts that were included in his analysis. This composite of the eight districts shows that if a three-inch rainfall occurred on a district having a pumping capacity of one inch per 24 hours, there would be no accumulation of water in the district. If, however, a rainfall of five inches were experienced, there would, with the same pumping plant, be a surplus of 0.5 inches to be stored in the reservoir canals at the end of 24 hours. At the end of 48 hours the surplus would be reduced to 0.2 inches and before the end of the third day the canals should be restored to normal level.

Effect of Tides

Tides — The bayous, rivers and other tributaries located in the flat coastal areas of Southern Louisiana are within sufficient reach of the Gulf of Mexico to be affected by tides. The daily tides in these bodies of water range normally from 0.5 to 1.5 feet. Tides and consequently the water levels in the bayous and rivers adjoining drainage districts in this area are greatly influenced by the direction and velocity of winds. Intense winds experienced in hurricanes may result in exceptionally high tides in these waterways. These high water levels caused by tropical hurricanes do not occur frequently but the levee systems must be of sufficient height to prevent overflow and flooding of the districts they protect. Bayou Barataria is reported, in the vicinity of Lafitte, to have reached a high tide of plus 3.0 above Mean Sea Level (MSL) during the hurricane of September 29, 1915.

Within recent years hurricanes have struck the Southern Coast of Louisiana in 1915 and 1947. As indicated above, the hurricane of 1915 developed high tides of plus 3.0 M.S.L. feet in Bayou Barataria. This hurricane approached Louisiana from a southerly direction with some sections along the coastal area recording high tides as much as plus 8.4 feet M.S.L. Along the path of the storm the highest recording along the waterways in the interior was plus 4.7 feet above Mean Sea Level. This high tide was reported in Bayou Lafourche, 30 miles inland from the coast, in the vicinity of Cut-Off, Louisiana.

On September 19, 1947, a hurricane with winds of 98 m.p.h passed over the New Orleans area, approaching the City from a southeasterly direction. This storm caused tides of plus 5.0 feet M.S.L. in Lake Pontchartrain and the waterways on the east side of the Mississippi River. Because of the direction of approach, the waterways on the west side of the river were little affected by this hurricane with the gauge in the Harvey Canal showing a reading only of plus 1.4 feet M.S.L.

(Exhibit No. 6 Available Upon Request)

Change of Address

Louisiana Engineering Society members who have changed address are asked to send their new mailing address to John P. Fernandez, Secretary-Treasurer, 404 Baronne St., New Orleans, La.

Dome

(Continued from Page 12)

strengthened by a spider web framework of rods and pipes. Only seven items were on the bill of materials for the dome proper; standard 11-gauge (⅛-inch) sheet steel, 4-inch pipe, 1-inch and ¾-inch rod, 2-inch pipe sleeve, and 1½-inch nuts and washers. The dome weighs 567 tons, but its weight distribution along its foundation is such that it bears no more heavily on any one point than the wheel of an automobile on the ground.

Many Activities

As an inspection, maintenance and repair shop, the Union Dome activities range from execution of the periodic inspections required by the Interchange Rules of the Association of American Railroads to complete repair of a car that has been badly smashed in a derailing. The periodic work includes removal and test of safety and outlet valves and air brakes plus hydraulic testing of the tanks and the regular repacking of the journal bearings.

Repairs include patching or replacing insulation of special service cars such as for LPG, asphalt or anhydrous ammonia; test and repair of steam, hot oil or hot water heater systems; tank repairs of dents, buckles; and car repairs of handrails, running boards, gears, wheels, brake bands or brake shoes, couplers.

Before entering the new, colorful Union Dome, all tank cars pass down a wash track. Here they are sprayed with a detergent followed by heavy pressure rinses from five stations. All the LPG or said cars are completely purged of their contents at the LPG and acid area lying between the dome and car storage.

A Trackmobile, equipped with both rail and road wheels, takes care of all car shifting. The operator pulls cars right onto the transfer table, operates the table from his Trackmobile cab and then spots the car where he desires on the service tracks. There are 14 tracks for light tank repair, two for heavy tank repair, 10 for car repair and four for tank cleaning.

At the inside cleaning area, tank insides are thoroughly scrubbed so that the repair men work only on clean interiors. Cleaning is also frequently necessary when shifting cars from one type of liquid service to another. An air-powered jet-nozzle unit, rotating in both directions, applies the cleaning materials at pressures up to 1,500 psi.

Lifts Entire Car

A 30-ton gantry crane, capable of lifting an entire tank car, straddles the car and heavy tank repair areas. Each of the car repair tracks has its own one-ton gantry crane for lifting work previously handled manually. Underneath each track is a hydraulic jack pit similar to those found in automobile service stations.

Memorials

MR. ALBERT T. ROWAN

It is with sorrow that we note the passing on December 15, 1958, of Mr. Albert T. Rowan, a mechanical engineer and a member of the Louisiana Engineering Society. Al, at the time of his death, was Production Engineer in the Asbestos Cement Division of the National Gypsum Company, and had held that position since January 5, 1953. It was about that time that the former Asbestone Corporation of New Orleans merged with the National Gypsum Company.

Al was born in New Orleans in 1902 and spent his early youth here. He went to work in the area and rapidly progressed in the mechanical field. Just prior to the depression he was Chief of Motive Power for Lyon Lumber Company of Garyville, Louisiana, and of the Natalbany Lumber Company, Amite, Louisiana. During the early 30's he served as Liaison Engineer for the W. P. A.

In 1936 he became Chief Engineer for the R. J. Dorn Company of New Orleans, the company which later became the Asbestone Corporation. That company enjoyed rapid growth in the manufacturing of cement asbestos products, primarily industrial corrugated siding and roofing. The company reached national prominence and later entered the field of residential roofing and siding. There were no machines available on the market that adequately met the problems of the cement asbestos field, so it was necessary that Al either completely design and build the machinery needed by his company, or he had to take machines designed for other uses and alter them to serve his purposes. So successful were the machines and the production he supervised that the Asbestone Corporation built a new plant in St. Louis, Missouri, and also purchased an old plant and renovated it in Millington, New Jersey. Construction at both plants was under Al's direct supervision; both the buildings themselves and the production machinery in them. When Asbestone merged with National Gypsum, Al remained with National in the position he held at his death.

He is survived by his widow, Mrs. Marjorie Fanz Robillia Rowan, a son, and a daughter.

He was a member of the L. E. S., the A. S. M. E. and he was a Registered Mechanical Engineer for the State of Louisiana.

Be it resolved that this memorial be entered into the minutes of the Society and published in The Louisiana Engineer, and that copies be sent to the members of his family.

EDWARD A. McLELLAN, G. J. GROH

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CHARLES J. WYLER

On October 5, 1958, Charles J. Wyler after an illness of several months was called by his Heavenly Father.

Charlie Wyler will be greatly missed by his friends in the Engineering Profession in New Orleans and by his fellow members in the Louisiana Engineering Society.

Born in New Orleans on January 30, 1896, he attended Warren Easton High School and later Tulane University and in 1917 he received a degree of Bachelor of Engineering. After Graduation he served in World War I as a First Lieutenant of Artillery.

After being discharged from active duty in 1919 he became associated with A. M. Lockett & Co., Ltd., in the Engineering Department as Junior Engineer and continued his connection with that old established concern until his retirement, because of poor health, in June of 1953. He had advanced steadily in his affiliation with A. M. Lockett & Co., Ltd., and at retirement was Assistant Chief Engineer of the Company in charge of shop operation and field service.

While Charlie Wyler was essentially a very modest gentlemen, he was always ready to put his shoulder to the wheel or to join in any of the social activities sponsored by the Engineering Societies of which he was a member.

Mr. Wyler was an active member of the Louisiana Engineering Society and a life member of the American Society of Mechanical Engineers, and a member of the BPOE.

Mr. Wyler never married. He was survived by a sister, Mrs. Henry Voelkel and by two brothers, Louis G. Wyler and Albert Wyler, who is the Director of Streets of the City of New Orleans.

Be it resolved that this obituary be read at a meeting of the Louisiana Engineering Society, entered into the minutes, published in The Louisiana Engineer and copies be sent to the members of his family.

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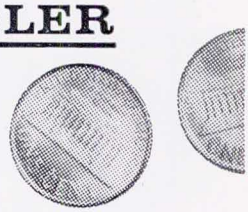

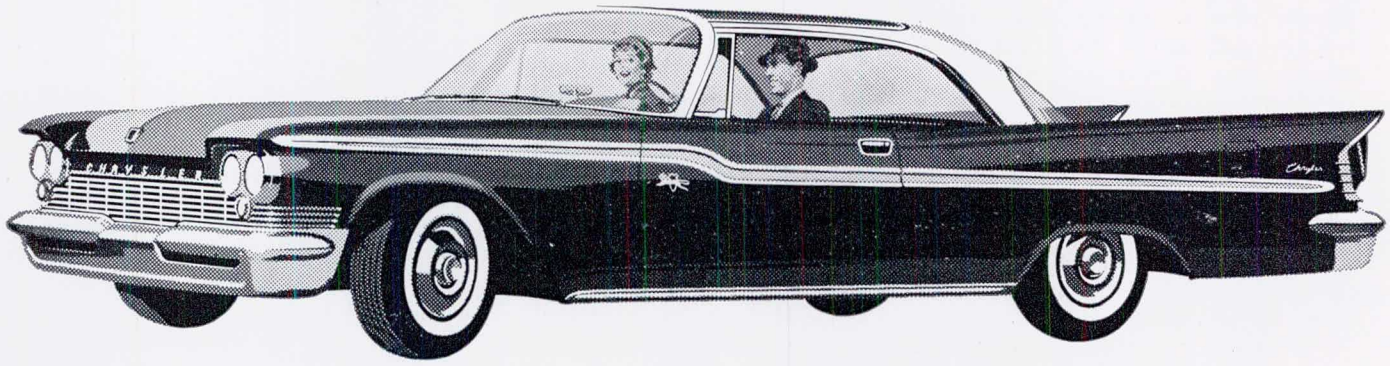

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Fresh Water For Bayou LaFourche

Thibodaux, La.—Fresh water, pumped from the Mississippi River into winding Bayou Lafourche, has given new hope to this section of South Louisiana.

Since shortly after the turn of the century, the bayou which wends its way 120 miles from the river at Donaldsonville to the Gulf of Mexico has been dammed at the river as a flood control measure.

As a result, the water in the bayou became stagnant, water lilies grew profusely and covered its surface, and in places the stream completely dried up.

Drinking water for the thousands of inhabitants of the area became a problem. Deep water wells south of Napoleonville are useless for drinking purposes because the water is too brackish. And, even around Napoleonville, the iron content of the water is so great that water pumped from wells will stain fixtures within a couple of weeks.

Solved Problem

Thibodaux solved its problem of water for household use in 1930 by laying a 17-mile pipeline to the Mississippi River and building a filtering plant. But, it's a costly operation, and city officials have had to crawl out of bed in the wee hours of the morning during high water seasons to go to the river to rescue their pumps.

There were few fish in Bayou Lafourche, and residents feared disease from its stagnant and polluted waters. Water was so scarce for industrial use that at least one of the several sugar mills that are the lifeblood of this section of South Louisiana had to close temporarily for a few days in the height of the cane harvesting season. And, the mills, using water from Bayou Lafourche had expensive equipment repairs and water treatment costs.

In 1955, the State Department of Public Works completed construction of a pumping station on the river at Donaldsonville. The results were as revolutionary for the friendly folk along the bayou as the pumping station itself.

The three vertical centrifugal pumps can each take 45,000 gallons of water a minute from the river and transfer it into Bayou Lafourche.

Prior to this installation at Donaldsonville, similar pumping stations were built with the pumps mounted directly over the surface of the river. With the equipment located right at the river's edge, there is always an inherent risk of total ruin of the installation when the river level reaches an abnormally high stage.

Pit Was Dug

In order to eliminate this problem, engineers designed the pumping station in a unique fashion. Behind the levee, a huge pit was dug over which the pumps were permanently mounted. Water freely flows into the pit from the river through huge pipes, six feet in diameter, which are laid under the levee.

As the water level of the river rises, so does the level of water in the pit. Using the pit as a water reservoir eliminates the problem of treacherous currents, eroding or caving banks, driftwood and other factors which cause foundation and maintenance costs to skyrocket.

The costly pumping equipment is installed high, dry and permanent, away from unpredictable river levels and currents.

This arrangement has attracted attention of some of the country's top engineers up and down the Mississippi, who have marveled at the pioneering technique of introducing river water into the pumps.

And, the pumps have assured many advantages to the Bayou Lafourche Fresh Water District—an area 4200 feet to the right and left of the bayou's center line.

Plant Saves Money

One of the eight sugar mill owners along the bayou says the fresh water saves his plant $3500 a year in chemicals alone which were formerly required to treat the water from the bayou to make it suitable for industrial use, and another $5000 on repairs to pipes and boilers in his mills. These sugar mills use about twenty million gallons of water a day during the approximately 70 days each year they are in operation.

And the fresh water from the bayou assures a continued reliable source of water for any other industry which may locate along the bayou in years to come. In planning the pumping station, provision was made for a 25 per cent expansion in use of water in the future. There's open land on both sides of the bayou suitable for industrial plants.

Assumption Parish plans to float a bond issue in the near future to put in a new water system, making use of water from the Bayou Lafourche Fresh Water District.

The City of Thibodaux has already voted a bond issue under which pumps will be erected to draw water directly from the bayou. This wll eliminate the costly maintenance of the 17-mile pipeline to the Mississippi River.

Officials of the Fresh Water District hope to be able to eventually supply water for use in Houma in Terrebonne parish.

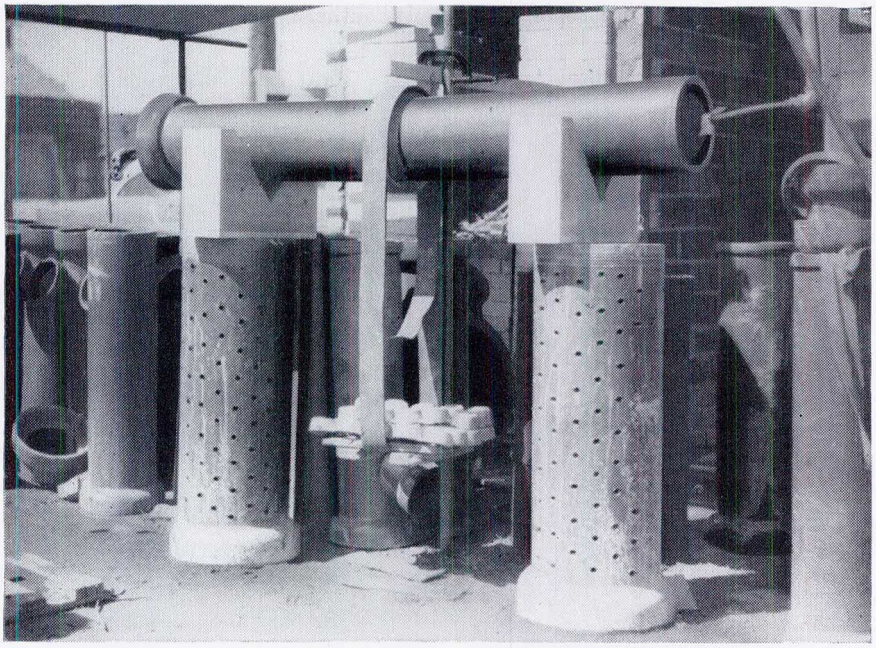
Ideal Fishing

In addition to providing a plentiful supply of fresh water for industrial and household use, the new Bayou Lafourche offers ideal fishing. Sportsmen of the area speak in glowing terms of the batfish, bream, and other fresh water fish.

With fresh water in the bayou, boating has become a popular sport up and down the stream. In fact, about 3000 pleasure boats, mostly outboards, have been bought in the area within the past two years.

"River water has already helped us greatly," says H. E. Smith, chairman of the board of commissioners of the Bayou Lafourche Fresh Water District, "and we believe we have just begun to advance in this area of South Louisiana."

Smith says the whole project shows what can be done when progressive people work together. Ascension, Assumption and Lafourche Parishes put up $375,000 from a bond issue, the Lafourche and Atchafalaya Levee Boards each contributed $250,000, and the Department of Public Works put up $400,000 to build the pumps along the Mississippi.



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La. Population Up 16.7 Per Cent

Louisiana has increased its population 16.7 per cent since 1950.

Citing figures released by Sales Management magazine, Curt Siegelin, executive director of the Department of Commerce and Industry, pointed out that the population of the entire state rose from 2,683,516 in 1950 to an estimated 3,132,600 at the present time. Projected population for the state in 1970 is 3,695,000.

Siegelin added that 37 parishes in the state showed an increase, while 27 registered a decline.

"However," he stated, "some of the parishes showing a deficit this year will be on the plus side after the 1960 census due to industry which is moving in this year."

The director noted that most of the population decrease occurred in the northern or rural parishes, while most of the heaviest gains showed up in the metropolitan centers surrounding New Orleans, Baton Rouge, Lafayette, Lake Charles, Shreveport and Alexandria.

"These areas have been fortunate in attracting industry, which naturally brings in workers, while the rural area populations have been depleted by mechanization of farms throughout the state. We are continually striving to induce smaller industries to move into the less populated areas to improve the economy in these regions," he added.

St. Bernard Leads

Biggest percentage gain was registered by St. Bernard Parish, up 249 per cent over 1950. Population increased in the parish from 11,087 to 31,800 during the nine-year period. Second highest was Jefferson, with an increase of 70 per cent, and third was Calcasieu with 52 per cent.

In actual numbers, Orleans Parish led the state with an increase of 89,655, followed by East Baton Rouge with 77,664 and Jefferson with 72,327.

On the minus side, Cameron Parish led the state with a drop of 22 per cent, from 6244 to 4900. Second was Red River with a decrease of 17 per cent, followed by Bienville with 15 per cent.

In numerical decrease, Bienville led with 2805, DeSoto was second with 2598 and Claiborne was third with 2463.

Siegelin said a color map showing the population shifts prepared by the Department of Commerce and Industry is available in limited quantities to interested parties at department offices in Baton Rouge.

Select Boxx For Training

Southern Bell Telephone has announced selection of B. W. Boxx, 517 North Bengal Road, Metairie, to participate in the Operating Engineers Training program at the Bell Telephone Laboratory, Murray Hill, New Jersey.

The intensive 18-month program is conducted on a post-graduate level and is designed to acquaint telephone engineers with fundamental physical and engineering principles to be used in telephone systems of the future.

Boxx, a native of Tampa, Florida, is a 1950 graduate of Louisiana State University with a degree in Electrical Engineering. He joined the Southern Bell Engineering Department in 1950 and subsequently served 6 years in Lafayette. Since 1956 he has been handling various engineering assignments in the state headquarters in New Orleans.

He is a member of the Louisiana Engineering Society and Tau Beta Pi, national engineering honor society. He is a lieutenant in the U. S. Naval Reserve attached to Surface Division 8-12 in New Orleans.

He is married to the former Melba Faye Lejeune of Baton Rouge. They have four children, Susan, Karen, Drew and Donald.

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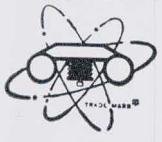

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INDEX OF ADVERTISERS

A-1 Employment Service	27
American Creosote Works, Inc.	25
Brand Dispatching Co.	25
Central Louisiana Electric Co.	25
Connecticut Mutual Life Insurance Co.	5
Creole Engineering Co.	26
Lester J. Danner, Inc.	15
W. S. Dickey Clay Mfg. Co.	23
Eugene Dietzgen Co.	26
Equitable Equipment Co., Inc.	2
Gulf States Utilities Co.	2
Allan J. Harris Co.	26
T. L. James and Co., Inc.	2
Le Baron Motor Co.	21
A. M. Lockett & Co., Ltd.	27
McLellan Equipment Co.	25
Menge Pump & Machinery Co., Inc.	15
Mutual Benefit Life Insurance Co. of Newark, N. J.	6
New Orleans Blue Print & Supply Co., Inc.	24
Professional Listing	12-13
Bee Robertson's Employment Service	20
Shilstone Testing Laboratory	28
Southern Bell Telephone Co.	14
Standard Supply & Hardware Co., Inc.	27
Steel Service, Inc.	3
Underwater Services, Inc.	3
Williams-McWilliams Industries, Inc.	28
Yarberry's	27

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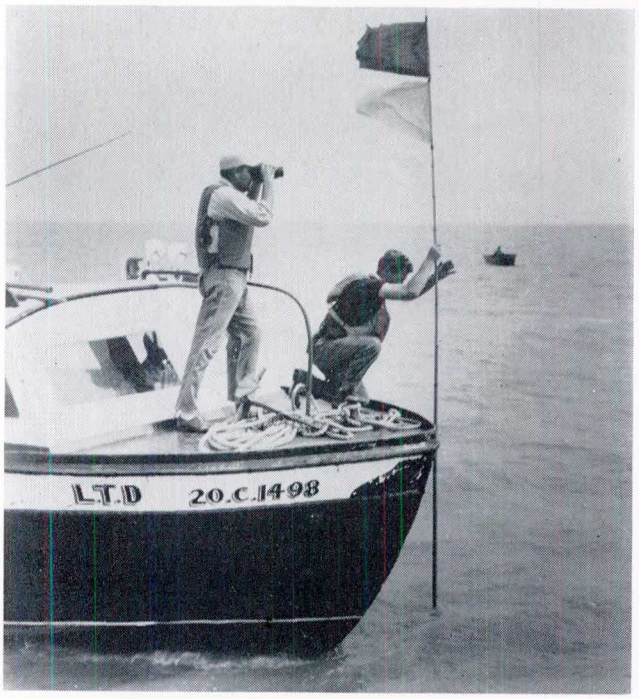

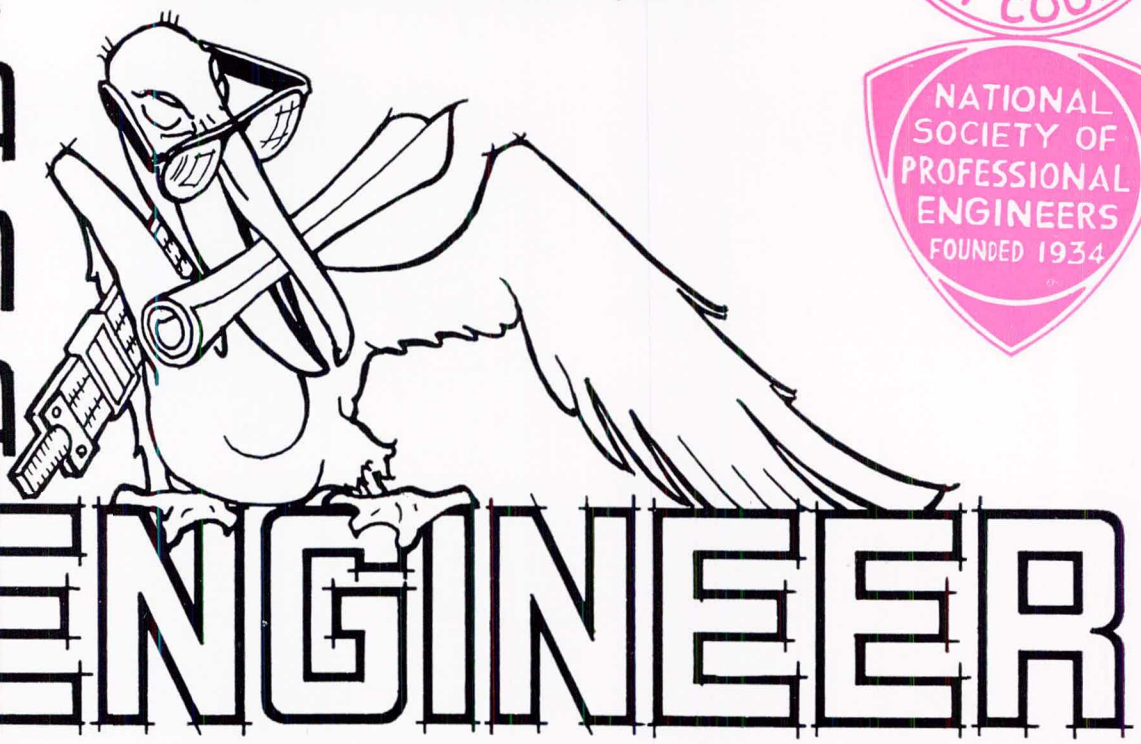

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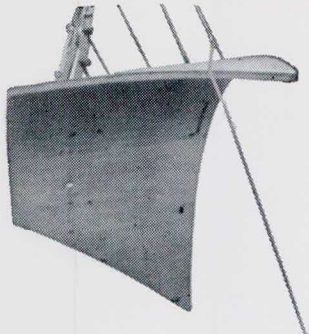
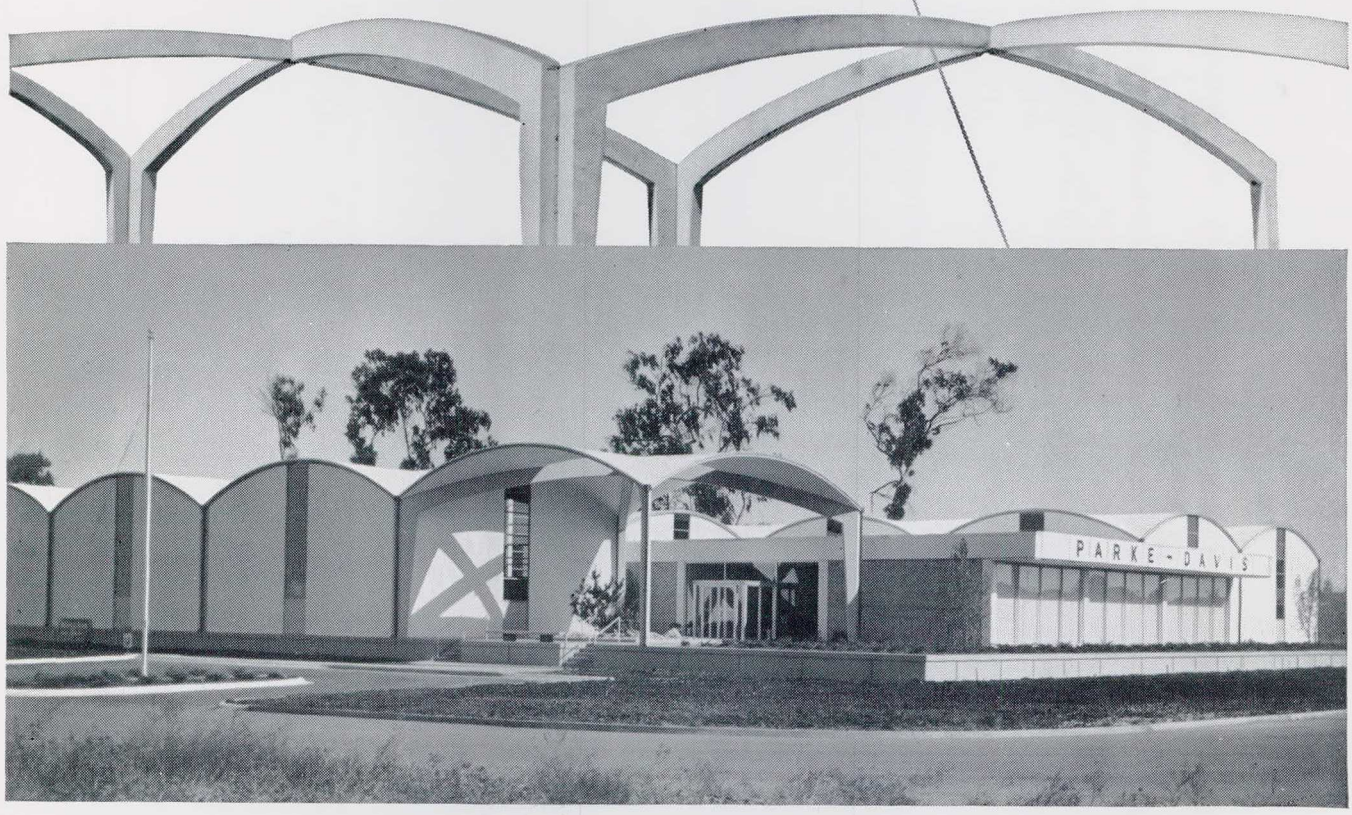


Parke-Davis building
at Menlo Park...

jaunty "showcase" assembled from just 3 basic shapes in precast concrete



Beauty is good public relations, agreed officials of Parke, Davis & Company in planning this combination office and warehouse in a restricted industrial area in Menlo Park, Calif. To achieve this beauty, and fill practical needs as well, concrete was chosen for the whole job.

Shell-roof sections, L-shaped bents and wall panels were all precast, quickly and easily assembled on the job site. The results: a graceful, pleasing silhouette; the wide-open, fire-resistant interior specified; and a clean, modern look that suits a maker of pharmaceutical products.

Architects: Minoru Yamasaki & Assoc., Birmingham, Mich. Associate Architects: Knorr-Elliot Assoc., San Francisco, Calif. Structural Engineers: Amman & Whitney, New York City.

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THE LOUISIANA ENGINEER

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CONTENTS

	Page
LES OFFICERS, STANDING COMMITTEE	4
LES MINUTES, NEW MEMBERS	5
EDITORIAL: EXAMINES SUIT	7
AUDITOR'S REPORT	7
CONDUCTS 'SURVEY' OF SURVEYING	8
FIELD NOTES; NSPE, EJC NEWS	10
PROFESSIONAL ENGINEERS GRANTED REGISTRATION	11
WHAT EVERY PROFESSIONAL ENGINEER SHOULD KNOW	12
PROFESSIONAL LISTING	12-13
REPORT ON LUBRICANTS	14
TIDEWATER CHANNEL PLANT	16
LIGHT ENDS RECOVERY PROGRAM	18
MEMORIALS	20
SHREVEPORT AND TRAFFIC	22
AIEE MARKS 75TH YEAR	24

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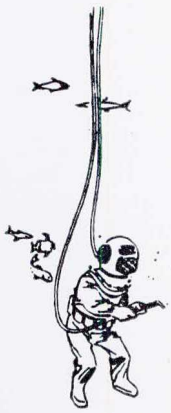

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OUR COVER: *Contract surveyors place a stake on the survey line off Morgan City in the Gulf of Mexico. Seismographic crews map possible oil-bearing formation, a first step in successful petroleum production. Petroleum engineers and surveyors this month are observing centennial of oil industry (Photo by Shell Oil Co. photographer Larry Schoenberger). See related stories on Pages 8, 14, 18.*

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The service we refer to has to do with the individuals and companies who advertise in this publication.

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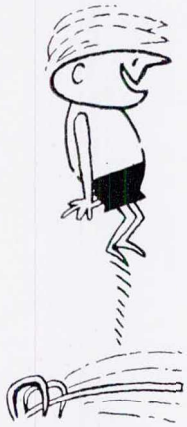

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Letters

To the Editor:

May I congratulate you and your staff on the format and general makeup of the Louisiana Engineer. It is not only attractive but the articles are well prepared and of general interest.

PAUL G. MARTIN, P. E.
Burgwin and Martin
Consulting Engineers,
Topeka, Kans.

To the Editor:

I appreciate very much your sending me a copy of the Louisiana Engineer with the article on the Gramercy brine line in it. We are always happy to receive such recognition from publications of this nature.

W. T. BROWN
Manager of Public Affairs
Southern Region
Kaiser Aluminum & Chemical Corp.

To the Editor:

Allen W. Dulles, Director of Central Intelligence, thanks you for the copy of the April issue of The Louisiana Engineer.

Mr. Dulles has read the combination interview and report of his 8 April 1959 address before the Edison Electric Institute meeting in New Orlans. He regrets that as a matter of policy he may not comment on the article which you were so kind and thoughtful to send to him.

STANLEY J. GROGAN
Assistant to the Director
Central Intelligence Agency

La. Engineering Society

Minutes of meeting of the Board of Direction held at Baton Rouge on May 30, 1959

The meeting was called to order by President Sessums with Messrs. Alexander, Duclos, Janssen, McLellan and Fernandez present. Mr. F. Adams, immediate past president of the Monroe Section, was also present representing that Section.

The minutes of the May 11 meeting were accepted as corrected. The Secretary read a letter written to the Publication Committee Chairman, enumerating recommendations the Board had discussed at its last meeting with reference to improving the Society's publication.

Mr. McLellan announced that he had attended the installation of officers at the recent Annual Meeting of the Lafayette Section.

The auditors report for 1958 was presented whereupon Mr. Janssen moved that it be published in the Louisiana Engineer with a notation explaining that the decrease in liquid assets was due to the purchase of a $3,000.00 addressograph machine. Motion seconded by Mr. Duclos and carried.

A report concerning the activities of the Monroe Section during Engineers' Week was presented. The Board commended the Monroe Section for the excellent report.

A report from the sub-committee on Professional, Civic and Industrial Affairs was read. After some discussion, Mr. Janssen moved that the Committee pursue its investigation to a conclusion and that they be authorized to request Mr. Zervigon and Engineer "B" to attend one of their meetings and present their versions.

President Sessums announced that in accordance with the last meeting he had extended an invitation to the National Society of Professional Engineers to hold their 1962 Annual Meeting in New Orleans.

The secretary read a letter from Mr. J. Ranna, Chairman of the Annual Outing Committee, reporting the plans of his committee and advising that the Annual Outing would be held on October 13 at the Metairie Country Club.

Mr. Janssen announced that he, as sponsor for the Annual Outing and the Technical Papers Committees, wished to commend Messrs. Ranna and Cade for their excellent cooperation.

Mr. Janssen moved that Messrs. C. Palmer Jones, Henry St. Paul, and Leonidas L. Denson be appointed to the Annual Outing Committee. Motion seconded by Mr. Duclos and carried.

Mr. Duclos explained the procedures of the Legislature during passage of the concurrent resolutions affecting the Registration of Public Employees.

Mr. McLellan moved that Mr. Wm. H. Rhodes be appointed editor of the LOUISIANA ENGINEER. Motion seconded by Mr. Duclos and carried.

Mr. Alexander moved that the following members be dropped for non-payment of dues: John M. Barksdale, Baton Rouge; James R. Bres, Bay St. Louis, Miss.; Mrs. Pearl Pierce Burke, New Orleans; Thomas A. Boudreau, Metairie; James T. Dwyer, Jr., Houston, Tex.; Verna Clawson, New Orleans; Bobby J. Conerly, Opelousas; George A. Flournoy, Lake Charles; H. C. Gillen, Shreveport; Gary J. Guidry, New Iberia; Jerome P. Guy, Montgomery, Ala.; Everett K. Johnson, Metairie; Leslie M. Johnson, Pensacola, Fla.; Ted H. Kalencki, Jackson; Joseph E. Kelly, Shreveport; Samuel P. Landry, Jr., Norco; George F. Lomax, Jr., Wilmington, Dela.; Wallis J. Morgan, New Orleans; Gordon J. Munzey, Gonzales; James R. Potter, New Orleans; Sidney L. Poleynard, Baton Rouge; Hillary C. Sanders, Monroe; Samuel J. Stokes, Covington; Douglas S. Talbot, Houma; L. W. Terry, DeRidder; Billy A. Weisfeld, Metairie; W. Valdemar Westh, Baton Rouge; Billy J. White, Baton Rouge; Lovett Young, Baton Rouge.

Motion seconded by Mr. McLellan and carried.

The secretary read correspondence from Mr. Louis B. Mann, after which, upon motion duly made and seconded, Mr. Mann's resignation was accepted, retroactive to December 31, 1958.

On motion by Mr. Alexander and seconded by Mr. Duclos, Mr. J. L. Blackburn's election was declared void. Mr. Blackburn moved out of the state shortly after applying for membership and has not accepted his election.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ,
Secretary-Treasurer.

New Members

Harry Walter Atkinson, Ruston; William Frank Becker, Jr., New Orleans; Marvin T. Bond, Ruston; Raymond Cay Fleming, Jr., Port Sulphur; James H. Jenkins, Jr., Baton Rouge; Arnott Lewis Jones, Jr., Shreveport; Raymond Joseph Laurent, Lafayette; Young Burt Olive, Jr., Shreveport; Edward William Olsen, Port Sulphur; William Allen Patrick, Monroe; Arthur Jackson Perrault, Jr., Baton Rouge; Charles Pemberton Perrault, Baton Rouge; Loyd J. Rockhold, Baton Rouge; James C. Ryan, New Orleans; Richard M. Schroeder, Lake Charles; Julian F. Tablada, Baton Rouge; David Bertram Young, New Orleans.

TRANSFER FROM JUNIOR MEMBER

Frank M. Heroy, Jr., Baton Rouge.

AFFILIATE MEMBER

Lenhart A. Bland, Jr., Shreveport; Louis S. Harris, New Orleans; Howard Paul Landry, Monroe; Kenneth Charles Landry, Baton Rouge; Walter J. Landry, New Orleans; Frank G. Love, Lafayette; Albert Frank Lusch, New Orleans; Glenn Edward Orr, Jr., New Orleans.

JUNIOR MEMBER

William Lelon Corbin, Jr., West Monroe; Jerome C. Gordy, Abbeville; Whitney Pearson Musgrave, Chalmette; Frank Nicoladis, New Orleans; Hugh Rockey Pearson, Ruston; Charles W. Robertson, Arabi; Robert Everett Rood, Sharon, Penn.; Bernard L. Ruckstuhl, Metairie.

TRANSFER FROM STUDENT TO JUNIOR

Joseph L. Andrus, Jr., Harold Guidry, Ronald J. Oubre, Billy Joe Ashley, Stafford D. Guillory, Richard J. Patout, Scott T. Assenheimer, Roland R. Haydel, Lee Joseph Pitre, Jr., Edward L. Barron, Warren Gayle Hebert, James Rodney Pousson, Douglas A. Bernard, Fred T. Henrich, Jerry Raggio, Elton G. Breaux, Daniel M. Jorge, James Roberts, Vincent C. Cuccio, Donald B. Keith, Joe Romano, Patrick Cunningham, Remie J. Kliebert, Gerardo Diaz Romeu, Richard Wilson Dietz, Donald L. Lindemann, Travis Smith, Frank Dimmick II, Edwin A. McClanahan, Travis A. Star, Allen R. Domingue, Bernard Marcantel, Robert G. Taylor, Joseph D. Duhon, Thomas H. Mahan, Alexander J. Theriot, Ronald Clayton Fontenot, Luther C. Morantine, Richard Walther, William Ernest Watkins.

JUNIOR MEMBER SCHOLASTIC AWARD

Bruce Baird, Jr., New Orleans.



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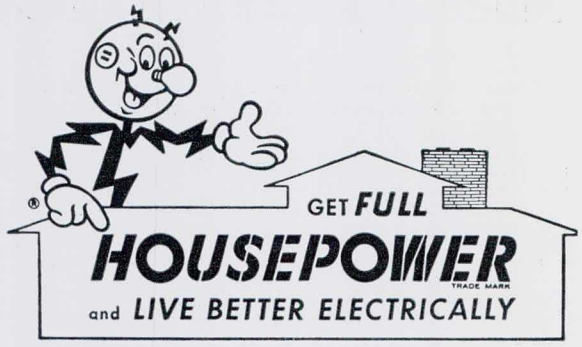

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Editorial:

Examines Suit Against Engineer

A Louisiana consulting engineer, a life member of LES, and a member of the American Society of Civil Engineers has been named a co-defendant in a lawsuit asking $158,000 damages in behalf of the heirs of a contractor's employee electrocuted on a construction project.

Also named as defendants were the general contractor, the subcontractor, and the insurance companies holding policies on the contractors and the consulting engineer in this project.

Without going into the full details of this case, The Louisiana Engineer feels that a general summary will be both informative and instructive to members of the engineering profession.

The consulting engineer says that he is unable to ascertain why he was brought into the suit since he was the designing engineer, and had engineering supervision of construction only of this plant and was not responsible for the contractor's employees. He holds that there was no defect in the plans or in any part of the design for this plant which has been in operation for about a year.

He told The Louisiana Engineer: "Remembering the decision of the East Baton Rouge Parish judge recently in a case where the architect, as well as the contractor, was sued for the death of an employee, I find it very necessary to use everything possible to fight this suit.

"It not only affects me personally, of course, but an unfavorable decision of any one of the courts would seriously affect the entire engineering profession."

He noted that, in the Baton Rouge case, the American Institute of Architects did not enter the case until the judge's decision had been rendered; subsequently it did, and the decision of the appeals court is pending.

The consulting engineer is having prepared copies of his plans and specifications for this project, to enable the Society and the American Society of Civil Engineers to familiarize themselves with the matter.

"It no doubt, would help considerably if a number of my brother engineers would testify as to the correctness of the plans and specifications, etc. and at the same time explain to the Court the duties of the engineer on similar work," he said.

(Continued on Page 17)

AUDITOR'S REPORT

May 18, 1959.

Board of Direction
Louisiana Engineering Society
New Orleans, Louisiana

Dear Sirs:

I have audited the accounts of the Louisiana Engineering Society for the year ended December 31, 1958 and submit the following:

Balance Sheet, December 31, 1958 (Cash Receipts and Disbursements Basis) (Exhibit "A")

Statement of Income and Surplus for the Year Ended December 31, 1958 (Cash Receipts and Disbursements Basis) (Exhibit "B")

The cash on deposit at December 31, 1958 in the regular checking account and in the various homesteads was verified by certification obtained from the depositaries and the U. S. Savings Bonds in the Society's bank box were inspected by me.

My examination was made in accordance with generally accepted auditing standards and included such tests of the accounting records and such other auditing procedures as I considered necessary in the circumstances.

In my opinion, the accompanying Balance Sheet and Statement of Income and Surplus fairly present, respectively, your financial condition at December 31, 1958, and the results of your operations for the year then ended.

/s/ Carlos J. Grimader, Certified Public Accountant.

LOUISIANA ENGINEERING SOCIETY
EXHIBIT "A" BALANCE SHEET, DECEMBER 31, 1958
(CASH RECEIPTS AND DISBURSEMENTS BASIS)

ASSETS

CASH:	
Checking account—Whitney National Bank of New Orleans	$ 1,041.24
UNITED STATES SAVINGS BONDS, SERIES F AND J	
(Maturity Value—$4,000.00)—redemption value	3,310.00
INVESTMENTS—HOMESTEADS: (At Cost)	
Columbia Homestead Association	2,000.00
Commonwealth Homestead Association	2,000.00
Greater New Orleans Homestead Association	662.16
Security Building and Loan Association	1,500.00
State Savings and Loan Association	1,500.00
Union Savings and Loan Association	1,500.00
Total Investments—Homesteads	$ 9,162.16
PROPERTY:	
Lapel emblems on hand	$ 347.09
Furniture, fixtures, equipment and books—Nominal value	1.00
Total Property	$ 348.09
TOTAL ASSETS	$13,861.49

LIABILITIES

SURPLUS (Per Exhibit "B")	$13,861.49

LOUISIANA ENGINEERING SOCIETY
Exhibit "B" STATEMENT OF INCOME AND SURPLUS
(ON CASH RECEIPTS AND DISBURSEMENTS BASIS)
FOR THE YEAR ENDED DECEMBER 31, 1958

INCOME

Dues collected (less rebates to sections, $3,997.33 and $1,887.00 to National Society of Professional Engineers)	$11,906.17
Advertising revenue	275.00
Income from investments and savings accounts	460.62
Interest on former deposits in Interstate Trust and Banking Company	124.60
Miscellaneous—profit sale of certificates, etc.	62.25
Total Income	12,828.64

EXPENSES

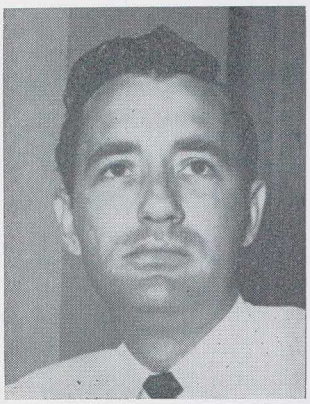
Cost of annual meeting—excess of disbursements over receipts	$ 55.21
Expenses paid in advance—succeeding year's annual meeting	402.23
Cost of annual outing—excess of disbursements over receipts	10.99
Salaries:	
Secretary-Treasurer	3,800.00
Assistants	1,019.77
Cost of publishing proceedings	1,677.43
Dues to other organizations	137.00
Refreshments, etc. at meetings (less pro rata receipts from joint meetings held)	392.09
Printing, stationery, and supplies	1,402.06
Postage	1,097.45
Cost of Engineers' week	279.10
Floral offerings	70.68
Medals, awards and trophies, etc.	75.62
Social Security tax	117.12
Auditing	150.00
General expenses	184.56
Traveling expenses	15.30
Scholarship tuition	400.00
Rent—headquarters	165.00
Vocational guidance	179.19
Total Expenses	$11,630.80
NET INCOME FOR THE YEAR	$ 1,197.84
DEDUCT—Capital expenditures—purchase of addressograph equipment less $75.00 from sale of table	(3,104.19)
SURPLUS (DEFICIT) FOR THE YEAR	**$(1,906.35)**
SURPLUS AT JANUARY 1, 1958	15,767.84
SURPLUS AT DECEMBER 31, 1958	$13,861.49

Pyramids to Mt. Everest:

He Conducts 'Survey' of Surveying

By R. H. BURNSIDE, JR.

Surveying is defined by at least one dictionary as "business or act of making surveys of land." Surveyor is defined in the same source as "persons who surveys, especially land."



R. S. BURNSIDE, JR.
. . . conducts "survey"

The practice of surveying portions of the earth's surface is older than any written record that has been uncovered up to this time. In the "Iliad" and "Odyssey," epic poems ascribed to the blind Grecian poet Homer, some translators find what they interpret to be references to surveying practices in existence at the time of the Trojan Wars in the early 12th century B. C.

Probably the oldest known reference to surveying in a document is found in a Sanskrit manuscript in which it is stated that the Chaldeans (Babylonians) estimated 4000 steps of a camel to be equal to one mile and that 66.25 of such miles were equal to one degree of latitude, and further, from that data, 24,000 miles were deduced as the circumference of the earth.

The earliest measurements were probably made by using some part of the human body, such as the foot or forearm.

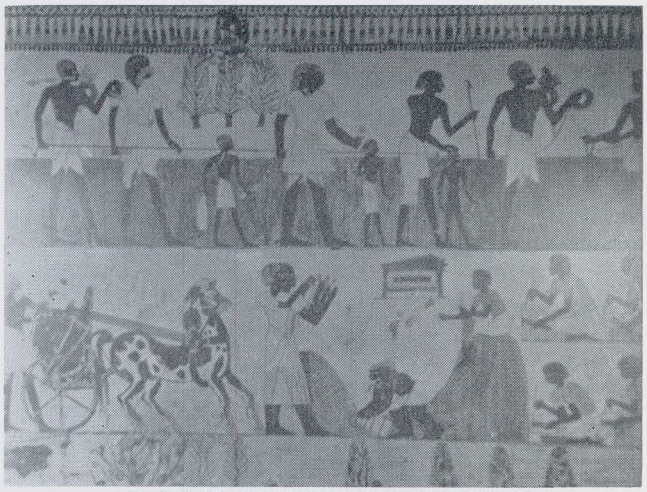
Inscriptions on the Palermo Stone which recorded events during the II Egyptian Dynasty of about 3000 B. C. show river gauge readings and "numbering of gold and lands."

Although we do not have maps of landed property in ancient Egypt, we do find on some of the old tomb walls, representations of land measurers, or surveyors, at work. One such scene (see cut) depicts two chainmen measuring a field of corn with a long cord on which are knots or marks at regular intervals.

During the past century, a great number of papyrus records concerning measurements, registration and qualities of lands in Egypt have been recovered from ancient tombs which indicates the importance and extent of the work at that time.

Instruments for obtaining an accurate bearing were used by the Egyptians at a very early date. A check of the Pyramid of Cheops near Giza discloses that the base of the pyramid is laid out in an almost perfect square and that it is oriented only 3'06" west of a true north meridian. These amazing results were obtained by use of a "merkhet" or plumb line in connection with

R. S. Burnside, Jr. is survey analyst in Shell Oil Co.'s New Orleans Area land department. A graduate of Louisiana Polytechnical Institute in Ruston, he holds a B.S. degree in civil engineering. He is a member of LES and the American Congress of Surveying and Mapping.



ANCIENT EGYPTIAN SURVEYORS
. . . marked boundaries well

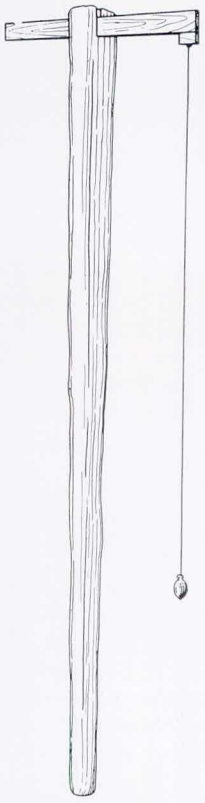
circumpolar stars.

This instrument (see cut) was in use in Egypt from early times, and consisted of a short plumb line and plummet hanging from a holder. This was sighted on any object by looking through a cleft piece of the centerrib of a palm leaf as a sight vane. It was used for setting out a line in any selected direction with the aid of terrestrial marks or a celestian body such as the sun or a star.

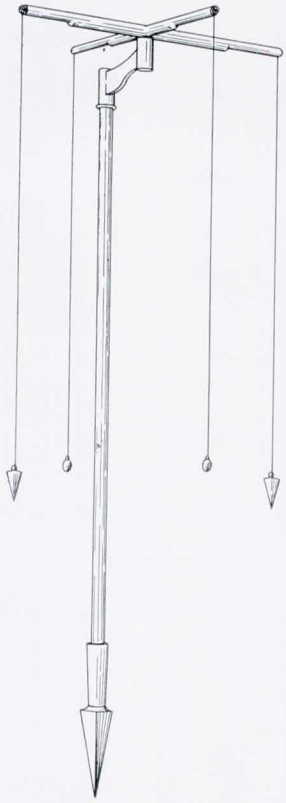
The early Egyptians also attained a very satisfactory accuracy in leveling, and of this the Great Pyramid at Giza furnishes proof. The rock pavement on which the Pyramid was built was carefully levelled before construction was begun, and investigations reveal that it was very successfully done. The pavement surface was found to have a slope of only 6mm from east to west and 14mm from north to south over a distance of 230 meters in each case or 1 in 38,000 and 1 in 16,500 approximately.

It is not until the Graeco-Roman times that any surveying instruments other than the measuring cord and rod, the "merkhet" for obtaining bearings, and the triangle and plumb-line for levelling are met with. The "groma" was widely employed in Italy, where the Romans attributed it to the Etruscans, but it was also in use in Egypt. The groma (see cut) consisted essentially of two plumb-lines suspended from the ends of two rods set at right angles to each other.

The groma was finally supplanted about 125 B. C. by an instrument called the "dioptra," supposedly invented by Hero of Alexander who wrote an accurate and detailed description of the instrument in a treatise. Unfortunately, the 11th-century codex of this treatise, which is preserved at the Bibilotheque Nationale in Paris, is incomplete, so a reconstruction of the instrument is not easy. With the dioptra, not only could lines be laid out



EGYPTIAN MERKHET
. . . help build pyramids



ROMAN GROMA
. . . military roads

in any direction and vertical angles measured, but levelling could be done.

The dioptra consisted of a peep site mounted on an alidade, pivoted in the center and moving about a circular disc which was divided into 360 single degree divisions.

It was by the Romans that the art of surveying was first recognized as a profession. The Roman surveyors, called "agrimensores," chiefly surveyed military camps, roads, aqueducts and property lines.

Another instrument contributed by the Romans was the chorobates. Designed for levelling only, it consisted of a straight edge about 20 feet long with strips of legs fastend at right angles to each end. Braces were placed between the legs and the straight edge. Plumb bobs were suspended from positions near the ends of the straight edge and marks were made on the braces the same distance from the legs as the points of suspension of the plumb lines.

One important refinement: The Romans cut a groove about five feet long in the top of the straight edge. This groove was filled with water so that a level position could be determined when there was too much wind to work with the plumb lines.

One of the oldest instruments still be found in use today is the Astrolabe. Geoffrey Chaucer wrote a treatise on the Astrolabe, which described essentially the same instrument in use in 200 B. C.

Progress in the evolution of surveying instruments virtually stopped at the time of the fall of the Roman Empire, and it wasn't until the early 15th century that interest in improvements began to appear.

In 1556, Georg Agricola, a German scientist wrote and had published a book describing the type of compass then used for laying out tunnels and mine shafts.

Thomas Riggs, an English mathematician and surveyor, published in 1571, a book in which he described his "Topographical Instrument." Part of this instrument was a horizontal disc which Diggs called the "theodolitus" from which we get the name of our theodolite.

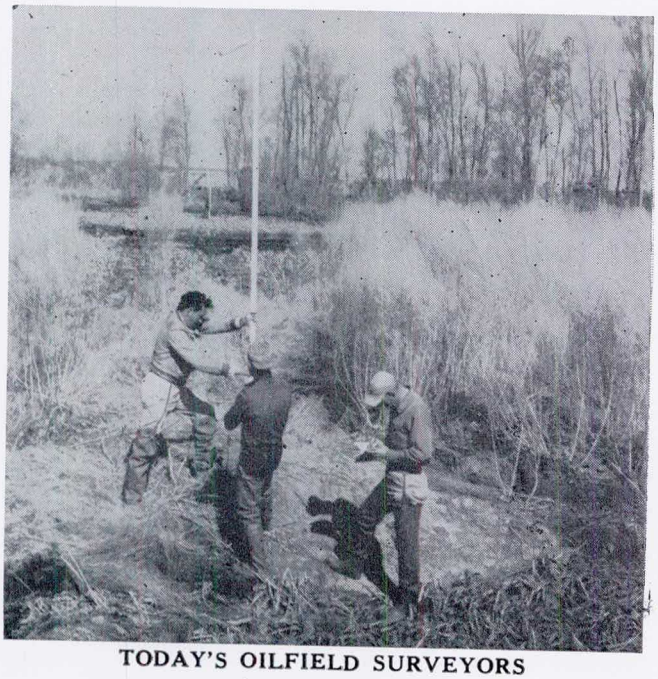
Trigonometric surveying or triangulation by application of the theodolite is reputed to have been used as early as 1615 when the instrument still had open sights. The telescopic sight, developed by Galileo, an Italian astronemer in 1609, is supposed to have been used for the first time by a French surveyor, Picard. Picard is also given credit by some for placing spider lines to indicate the focus, in 1669.

William Gascoigne, a young English scientists who had previously invented the micrometer, used silk threads for cross hairs, and is credited by others as being first to introduce them to surveying instruments.

The vernier, in 1631, was an enormous step forward in the direction of accuracy, but just as important was the development in the 1770's of a machine for the purpose of dividing astronomical and surveying circles by mechanical means rather than by hand as had been done up to that time.

The College of William and Mary in Virginia by its 1693 charter was made Surveyor-General of the Colony of Virginia and the faculty was entrusted with the duty of examining surveyors and issuing them licenses. George Washington, 1749, at the age of 17, was licensed a surveyor by this college. Modern transits, theodolites, levels and other surveying instruments have become functional to the extent that they are now used in many phases of man's every-day living and progress.

A 3½-inch Microptic Theodolite was adapted for use with a camera and accompanied Sir Edmund Hilary on his successful conquest of Mt. Everest in 1953.



TODAY'S OILFIELD SURVEYORS
. . . instruments change

Atomic — Field Notes
By Allen Johnson

Project engineer for the newly-dedicated NS Savannah, the world's first atomic-powered merchant ship, is New Orleans-born Harborough I. Lill. He attended Tulane University in 1937 and 1938, and received his B. C. of Engineering degree from the U. S. Naval P. G. School with an M. S. in electrical engineer, and in 1957 he was graduated from the Oak Ridge School of Reactor Technology. He has served as staff assistant and vice-president in engineering for the New York Shipbuilding Corp., and as project engineer on the Savannah for two years . . . Delivered to Atlantic Towing in Savannah over a year ago by Equitable Equipment Co., Inc., of New Orleans was a 105-foot Equity tug, coincidentally named the "Savannah," according to W. P. Oster, Equitable vice president. "Atlantic's president Frank W. Spencer, has a history of the original Savannah, first vessel to cross the Atlantic Ocean using steam power," he said . . . A 19,600-square-foot warehouse and office opposite the Illinois Central Railroad Hospital in New Orleans will house expanded facilities of the Airtemp Division, Chrysler Corp. Renovation cost approximately $15,000, said Charles M. Barr, New Orleans Branch manager.

Mrs. Lee H. Johnson is the new president of the New Orleans Chapter of the Woman's Auxiliary of the Louisiana Engineering Society. Other officers include Mrs. C. Glennon Melville, recording secretary; Baton Rouge Chapter President Mrs. Tom E. Alexander, recording secretary Mrs. Joseph L. Smilie; Alexander Chapter President Mrs. Leonard H. Bossier, recording secretary Mrs. Earl Cryar; Shreveport Chapter President Mrs. William G. Mayer; recording secretary, Mrs. Robert L. Hortor; Lake Charles Chapter President Mrs. Marion D. Garrison, secretary-treasurer, Mrs. Mohns M. Thornton; and Mrs. Frank C. Fromherz, chapter president-elect and yearbook chairman, New Orleans.



Mrs. Lee Johnson (above) is the new president of the New Orleans Chapter of the Woman's Auxiliary of the Louisiana Engineering Society (see Field Notes).

Department of Science

Based on recommendations presented by the President and Vice-President of E. J. C., Sen. Humphrey of Minnesota has introduced a bill providing for the establishment of a commission to study the desirability and function of a Department of Science and Technology, which EJC would like to see called Department of Science and Engineering.

Engineering Study

Faced with a national decline of 11.1% in Freshman engineering enrollment in 1958, EJC conducted a survey of 223 college deans to determine the causes. 173 deans responded; the majority cited principal reasons as: "False appraisel of long-range engineering career opportunities"; "Increased concern about rigors of engineering curriculum"; "Increased interest by potential engineering students in other scientific fields." Full report is available from EJC at no charge.

Directory of Societies

Prepared and published by EJC, the Directory is a comprehensive listing of International, National, State, Regional and Local societies, including addresses, executive staff, meetings, and publications. Canadian societies and state registration boards are also listed. Cost—$3.50.

Income of Teachers

Under an EJC grant from National Science Foundation a study of "Salaries and Income of Engineering Teachers" has been prepared by William H. Miernyk, Northeastern University. Available from EJC for $.25, this study is planned to complement the "Professional Income of Engineers—1958" prepared by EMC and released in January. ($3.00)

Kennedy-Ervin Bill

The Senate approved a compromise version of the Kennedy-Ervin labor reform bill, by a vote of 90 to 1. The lone dissenter was Senator Harry Goldwater of Ari-

(Continued on Page 17)

Professional Engineers Granted Registration

July 14, 1959—Wallace L. Adams, Hammond; Eugene H. Ammons, Lake Charles; Carroll W. Andrews, Shreveport; Ronnie M. Bays, Pollack; Douglas A. Bernard, St. Martinville; Alan T. Blackwood, Ruston; Nolan J. Bodin, Erath; Elliott R. Bowman, Jr., New Orleans; Earl C. Brimberry, Fairbanks; Albert S. Bynum, Baytown, Tex.; John W. Calhoun, New Orleans; Hoyt R. Cass, St. Paul, Minn.; Charles D. Chamblin, Jr., Lafayette; John B. Coffer, Jr., New Orleans; John A. Conrad, New Iberia; James B. Cordiner, Jr., Baton Rouge; Joe Francis Crouse, Baton Rouge; John P. Cunningham, Opelousas; Harry A. Currie, Jr., Shreveport; Stanley E. Cutrer, Baton Rouge; William A. Davis, New Orleans; James A. Ducote, Cottonport; Joseph D. Duhon, Kaplan; Roger B. Ellis, Crowley; Phillip B. Emmons, Shreveport; James C. Evans, Jr., New Orleans; Donald E. Fetzer, Sr., Baton Rouge; James A. Frosch, New Orleans; Charles R. Gay, Shreveport; Samuel L. Gerace, Glen Burnie, Md.; Gerard J. Gillen, Jr., New Orleans; Gerald P. Goff, New Orleans; James D. Goff, Dallas, Tex.; Jerome C. Gordy, Abbeville; Wilfred M. Hall, Brookline, Mass.; Theodore B. Harp, Baton Rouge; John H. Hemsarth, Huntingdon Valley, Pa.; Robert L. Heriot, Jr., Decatur, Ga.; Eugene C. Hochendel, Basile; Lawrence N. Hunsinger, Kaplan; Charles B. Jimerson, Ruston; Marion K. Johnston, Amite; Remie J. Kliebert, Welcome; Herluf T. Larsen, New Cumberland, Pa.; Roger C. Lind, Houston, Tex.; Thomas O. Lind, New Orleans; Donald L. Lindemann, New Orleans; Dudley R. Lindow, Aiken, S. C.; Felton L. Linton, Luling; L. C. Loper, Houston, Tex.; Charles R. Lott, Ruston; Norbert R. Luke, Lafayette; Joseph C. Marceaux, Kaplin; Albert M. McConnell, Jr., Baton Rouge; Lynn Maynard McCrum, Bryan, Tex.; Clark N. McLellan, Jr., Baton Rouge; Daniel Meyer, Kirkwood, Mo.; Ralph L. Nilsen, Houston, Tex.; Milton E. Parker, Archibald; Richard J. Patout, New Iberia; Egidio A. Picardi, Toledo, Ohio; Lee J. Pitre, Jr., Lafayette; Jimmie T. Powers, Shreveport; Wilson C. Pullig, Cotton Valley; James E. Raborn, Baton Rouge; Donald T. Ranna, New Orleans; Kenneth M. Raspberry, Jeanerette; Thomas P. Reed, Kenner; Richard R. Reeves, Oberlin; Walter Ristori, Sao Paulo, Brazil; James A. Roberts, Abbeville; Walter J. Rothschild, Alexandria; Pedro L. Salom Power, Moron, Venezuela; Malcolm O. Sayes, Baton Rouge; Michael A. Schulz, Jr., New Orleans; James E. Scott, Monroe; Norbert C. Shaver, Thibodaux; John W. Sherrouse, Jr., New Orleans; Richard W. Stewart, Bogalusa; Alexander J. Theriot, St. Martinville; Mortimer E. Turner, Jr., Thibodaux; Richard P. Walther, St. Martinville; Robert G. Wolfe, El Dorado, Ark.; Loren M. Womack, Vicksburg, Miss.; James E. Wyche, III, Monroe.

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*Products or Parts carried in New Orleans Warehouse

Ruston to Host November Instrumentation Meeting

The School of Engineering, Louisiana Polytechnic Institute, Ruston, Louisiana, announces the Eighth Annual Instrumentation Conference to be held on the campus November 5-6, 1959.

The papers which are to be presented at the technical sessions are:

1. "Fundamentals of Electric and Electronic Instrumentation" by E. E. Williams, Louisiana Tech.
2. "Electronic Computers for Automatic Plant Operation" by Donald L. Aswell, Louisiana Power and Light Co., Sterlington, La.
3. "Air Drying of Paper" by an engineer from Rice Barton Corp., Worcester, Mass.
4. "Electronic Instrumentation in Static Testing of Solid Propellant Rocket Power Plants" by an engineer from the Longhorn Division of Thiokol Chemical Corporation, Longview, Tex.
5. "Process Stream Analyzers of the Chromatographic Type" by H. O. Anderson, Olin Mathieson, Niagara Falls, N. Y.
6. "Distribution of A. G. A. Report No. 3" by Earl N. Armstrong of Transcontinental Gas Pipeline.

In addition to these papers, exhibits of new equipment in instrumentation and process control will be displayed by representatives of the leading manufacturers of such equipment, said Stewart Baggarly, publicity chairman for the conference.

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What Every Louisiana P. E. Should Know

(This is the first of a series prepared by the Editorial Staff of The Louisiana Engineer in an attempt to answer questions of interest to professional engineers in this area. Where, in certain instances, it become necessary to answer questions of a controversial nature, it must be re-emphasized that the opinions expressed are those of the Editorial Staff and do not necessarily reflect those of the Louisiana Engineering Society or the Louisiana State Board of Registration for Professional Engineers and Land Surveyors. For obvious reasons, no attempt will be made to go into legal interpretations since, in such matters, ethics dictate that we respect the boundaries of our sister profession.—Ed. Note.)

Question—In what particular phase is the Louisiana Registration Law most deficient when compared to the laws of the other states?

Answer—The Louisiana law requires no practical experience prior to registration as a Professionel Engineer. According to our law, a young man, upon graduation from an accredited engineering school, can apply for and be registered as a Professional Engineer, then immediately embark upon the practice of professional engineering with no other supervision than his own.

By contrast, 37 other states require that a prospective professional engineer, upon graduation, register as an "Engineer in Training," generally for a period of four years. During the four-year training period, he may practice professional engineering under the direct supervision of a Registered professional engineer. At the end of the training period, he is eligible to apply for registration as a Professional Engineer.

This seems to us to be a fair and reasonable requisite to registration as a Professional Engineer. Certainly, no young engineering graduate—not even a top honor student—is capable of assuming full responsibility for an engineering project particularly where the safety of the public is involved. No matter how gifted he is and no matter how well he has absorbed his college training, he still is not a qualified Professional Engineer until he has gained actual experience in the application of his college training under the guidance of an experienced Professional Engineer.

This is no reflection upon our engineering schools or their faculties who do an excellent job of supplying engineering fundamentals. It is a simple statement that an engineering graduate is no more capable of practicing professional engineering than a medical school graduate is capable of practicing medicine. Both require an internship. The Louisiana doctor must serve his **before** registration while the professional engineer serves his **after** registration.

Another important consideration is the fact that an engineering student, graduating and registering in Louisiana, finds that his registration will not be recognized by most other states until he has fulfilled the experience requirements. Since many of our engineering graduates seek experience with large manufacturing or engineering firms elsewhere before returning to practice in Louisiana, they are subjected to an unnecessary hardship often accompanied by some embarassment.

It is our sincere hope that state legislative approval will soon be given to revision of the Louisiana Registration Act to incorporate this important provision and at least put us on a par with the other states so that we can with pride be recognized for reciprocal registration.

Capital Conflict

Sen. Paul H. Douglas of Illinois has introduced a bill that would require the Capitol Architect to be a qualified architect. Sen. Douglas sharply criticized the building program of Capitol Architect J. George Stewart. "The present Architect of the Capitol is not an architect at all," Douglas said, "so I think it is highly important that Congress take over control of the office, and that the Architect should be a qualified man."

The bill does not spell out qualifications for the post, other than to provide that "No person shall be appointed Architect of the Capitol unless he is a qualified architect."

The incumbent, J. George Stewart, **is a registered professional engineer.**

DID YOU KNOW THAT:

48 original states, the District of Columbia, Alaska, Hawaii and Puerto Rico now register engineers.

31 states register land surveyors under the same laws governing engineers.

16 states register architects under the same laws governing engineers.

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Interplanetary Greases?

Problems Smoothed By Lubricants

BY H. M. FRASER
International Lubricant Corp.

Mr. Fraser's article is summarized from an address delivered before the New Orleans Section of the American Society of Mechanical Engineers at the Engineers Club on May 21, 1959.

Lubrication—proper lubrication—is essential to our livelihood. We see the need for modern lubricants. What are they now and what of the future?



Harold M. Fraser
. . . art of grease making

Any discussion concerning lubricants should be divided into two parts; namely, lubricating oils and lubricating greases. I will first discuss briefly lubricating oils and then greases.

Classifies Oils

Until the past 20 years or so, lubricating oils generally fell into one of three classifications:

1. Pennsylvania pure paraffin oils,
2. Paraffin base oils from the Mid-Continent fields, which were not quite as paraffinic as the Pennsylvania oils, and
3. Napthenic or asphalt base oils from Texas, Arkansas, and California.

These were mostly conventionally refined acid treated and at least partially dewaxed oils. They were blended into the SAE grades and were usually labelled either Pennsylvania oils, paraffin base oils, or naphthenic base oils. They served their purpose for many years and gave fairly satisfactory lubrication of the internal combustion engine and various industrial machines—that is, until heavier requirements were placed on lubricants in general.

As these heavier requirements on lubricating oils became prevalent due to increased speeds, longer driving, and higher compression ratios of the automobile—better oils were needed.

The chemists and petroleum engineers took over and soon solvent treated oils came into the picture. These were highly paraffinic, had low carbon content, and an excellent viscosity index. Their lubrication qualities were very good and they soon began to replace all the other oils, especially in the internal combustion engine.

During the manufacture of these solvent treated oils the impurities (asphalt, sulphur, etc.) were removed by solvents such as phenol, propane, cresylic acid, and furfural and their superior lubricating qualities were very evident. The old-type, conventionally-refined acid treated oils became less and less in demand.

H. M. Fraser is Vice-President of International Lubricant Corp. of New Orleans. He received a B.S. degree in Chemical Engineering from Purdue University, and assumed his present duties in 1929. He is a member of LES, American Society for Testing Materials, American Chemical Society, American Society of Lubricating Engineers, Society of Automotive Engineers and National Lubricating Grease Institute.

Lends an Assist

As the automotive engines began to make more changes (such as those for higher speeds, longer driving, etc.), lubricating oils alone, as they came from the refinery, just could not give complete satisfaction. So, the chemist again came to the assistance of the lubrication engineer and various additives such as detergents and inhibitors were devised to keep the oil from oxidizing and forming gum. The detergents kept the combustion and oxidation products in suspension and prevented them from depositing on the rings of the pistons. Viscosity index improvers and pour point depressants were added to help the car start more easily at lower temperatures.

The blending of oils with all of these additives is a tedious process, insuring that all of the various proportions of blends and additives are properly made. The present-day oil, especially for the internal combustion engine, is a highly-refined solvent treated product blended with various additives to impart improved characteristics as a lubricant.

Looks Into Future

Now, about the future. It is difficult to see how further improvements in refining technique can be made, but the chemists and engineers have come to our aid before and no doubt will do so again.

It is my belief, however, that improvements in lubrication will come mostly from the additive field.

Mention should be made of various other oils—such as turbine, marine, compressor, refrigerator, cutting, drawing, hydraulic, gas turbine, and the new multi-purpose 10W/30 motor oils. Research is being carried out on all these oils, and improvements will be made in blending, refining, and additive technique.

It is my personal opinion that diesel engines and gas turbines will come more and more into general use and eventually may replace the gasoline engine in the automobile.

Improvements in refining and the increase in octane values of fuels amount to a burden of many millions of dollars each year, so engines which will require lower-cost fuel will not doubt be a big factor in the future.

Gear lubricants should be mentioned. This is a highly developed technique in the manufacture of additives by additive manufacturers; of high film strength, they should be highly resistant to oxidation. They should not be corrosive and should not foam and form undesirable sludges.

Lubricating Greases

We now come to the second part concerning lubricants, that of lubricating greases.

Grease making thirty years ago was mostly an art. Some science unknowing peeked in the back door, but the scientific men had little to do with greases. Today it is different. Science has taken over and greases are the primary interest of many research chemists and

engineers.

Greases are used: 1) Where oil cannot be retained on the bearing surfaces due to clearances and slow rubbing speeds, 2 Where bearings have little or no attention for long periods of time, 3) Where high operating temperatures are encountered, and 4) In ball and roller bearings where the design prevents the lubrication by lubricating oil.

Greases are mixtures of soaps and petroleum oils. The principal lubricating medium is oil. The soap is present to retain the oil in a semi-solid or solid consistency and to impart certain characteristics to the final product. These characteristics are mainly melting point, water solubility or insolubility, texture, and mechanical stability.

Until World War II, only calcium, aluminum and sodium were the principal soaps used in greases. Calcium and aluminum greases had similar characteristics, but their low melting points gave them rather limited usage. They were water-resistant and could be used for chassis lubrication and for various industrial bearings where temperatures were not too high.

Cites Limitations

On the other hand, sodium greases had higher melting points and could be used on bearings operating at higher temperatures. However, this grease was water soluble and could not be used where water is present. Thus, there were limitations for all of the then known greases.

Due to the limitations, it was necessary for filling stations to carry in stock a number of greases—such as water pump grease, universal joint grease, chassis grease, and a wheel bearing grease. Industrial plants had many different greases for different applications. As a result, not-too-intelligent grease monkeys made many misapplications causing many bearing failures.

Grease chemists and grease makers were a troubled lot. They were accused many times of causing bearing failures when the fault really lay in the wrong applications. A new grease was needed—one grease that could be used for all applications and at all temperatures.

Lithium Made Available

It was during the early part of World War II that the metal Lithium became available in large quantities and almost immediately lithium stearate greases were introduced. Barium greases were also used to some extent by a West Coast grease manufacturer. Stearic acid, which was used in the lithium soap, is derived from tallow or the hydrogenation of some vegetable, fish, or animal fats. Attempts by the Military were made to make semi-multi-purpose greases with these lithium stearate greases and some measure of success was attained. However, their limitations were soon discovered and the idea of multi-purpose grease began to slip.

After the war a new grease—made from the soap of lithium 12-hydroxy stearate—was introduced.

This grease overcame the shortcomings of lithium stearate and by 1950 it was quite prominent throughout the entire country. It, by that time, was generally recognized as a very successful multi-purpose lubricant.

This grease is now being made in many variations and is the most successful multi-purpose grease for automotive and industrial uses.

Many filling stations and many industrial plants have only one grease now for their entire lubrication applications.

An extreme pressure version is now being made which is quite successful for truck and industrial purposes. The type of E. P. used has oiliness and spreading properties, which probably add to its popularity and success.

Another version of the 12-hydroxy stearate grease is made with calcium as the metal base. The Military use this grease in huge quantities, and it has been very successful as a global lubricant. It does not have as high a melting point as the lithium (approximately 300°F versus approximately 380°F for the lithium). Military uses call for a lubrication as low as -65°F and as high as over 200°F. This low-temperature application is not necessary for industrial plants and the automobile in the temperate zone, so that—at the present time—most grease manufacturers are making this type of grease for the Military only.

Industrial Use

Most ball and roller bearing manufacturers have taken to the lithium 12-hydroxy stearate greases, especially those greases to which have been added oxidation and anti-corrosion additives. These lubricants are especially adapted to bearings which are sealed and operated for the life of the bearing.

Such greases now make it possible—with the new 10W/30 oil—for only two products to be needed, one for oil lubrication and one for grease lubrication.

Another recent introduction to the grease field or multi-purpose items is the inorganic thickeners for oils. These new features of these new products are exceptionally high melting points. Most do not melt no matter how high the temperature is raised. It must be understood, however, that they may be good for short periods of high temperature lubrication, but no grease is any better at high temperatures than the oxidation stability of the oil used in its manufacture.

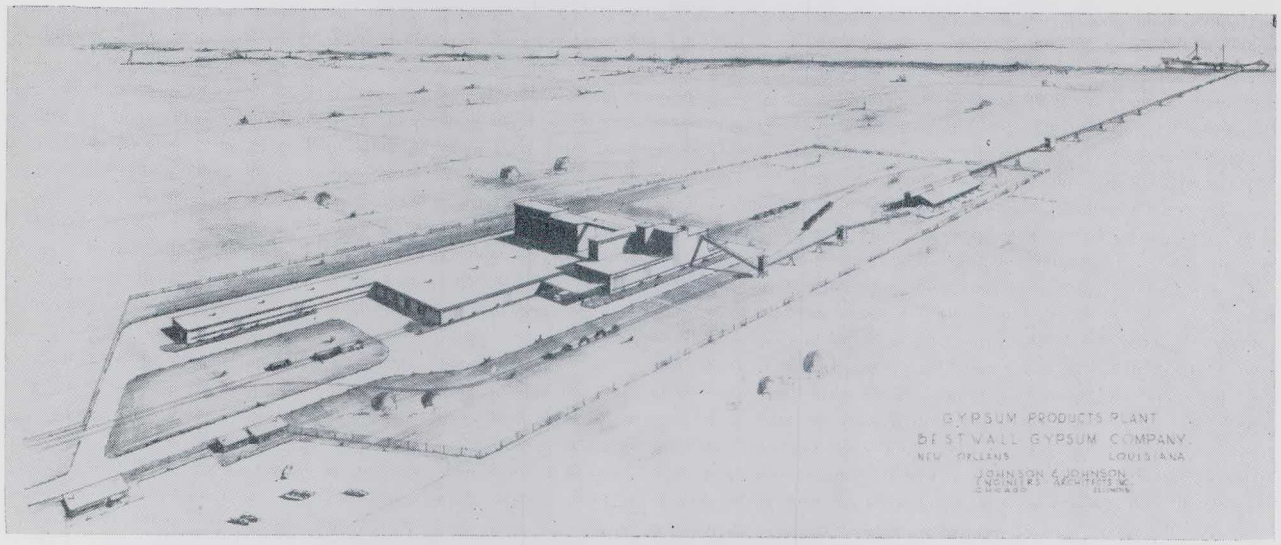
Secret of Success

These greases are composed of very finely divided particles of clay or silica chemically stabilized with the oil. Therein lies the secret of the success of this type. It must be properly stabilized with oil and with sufficient and proper anti-corrosive agents to prevent severe corrosion of metal parts. Of course, the particle size of the clay should be very small, preferably below 20 microns.

It is my personal opinion that the future grease may lie in that direction. The ideal grease should be capable of lubrication at very high and low temperatures, it should be resistant to oxidation at high temperatures and over long periods of time, it should be anti-corrosive temperatures and over long periods of time, it should be anti-corrosive and should have oiliness and extreme pressure properties to decrease wear and increase film strength.

If and when petroleum oils in greases cannot be used to meet all the requirements of specialized lubrication, here again synthetic oils may be used and the effective temperature range can be increased considerably.

Such a grease is not too far off and when exotic lubrication products are needed for interplanetary travel, I feel sure that the lubrication chemists and engineers will be ready with them.



Sketch shows new Bestwell Gypsum Co. plant on Tidewater Channel.

Bestwall Gypsum Makes Its Bid

First Tidewater Channel Plant Locates

Completion of Bestwall Gypsum Company's new $5½ million gypsum plant, the first industry to be located along the new Mississippi River-Gulf outlet, is scheduled for mid-1960.

The new plant is situated between the Louisville & Nashville Railroad tracks and the new outlet, east of the Industrial Canal.

When completed and in full operation, the plant will employ approximately 200 persons in producing 150 million square feet of gypsum board products per year.

Arrangements for establishing the plant came as the result of close co-operative action among Bestwall, city and port officials, utility and transportation men and the engineers involved.

An extension of Public Belt Railroad will serve the plant. Electric power will be furnished by New Orleans Public Service Inc. Sewerage, drainage and road facilities will be provided by the Sewerage & Water Board and the City Department of Streets.

Engineering work is being handled by Johnson & Johnson, Chicago, engineers-architects, and Bedell & Nelson Engineers, Inc., of New Orleans.

Under the plans for the port's development, a bulk handling facility will be constructed and operated by the Board of Commissioners of the Port of New Orleans adjacent to the plant.

The facility will unload approximately 200,000 tons of gypsum rock per year.

The facility would also serve such other general bulk cargo handling business as might be developed for it by the Board.

The bulk terminal, designed by Bedell & Nelson Engineers, Inc., will be able to handle the unloading of sand, gravel, coal, sulphur, bauxite, crushed limestone, light-weight aggregate, clamshells, oyster shells and sugar. It may also be adapted to the handling of phosphate rock, iron ore, chrome ore, manganese ore, nickel ore and other materials.

It is designed to permit an extreme versatility of unloading operations—from ship or barge to silo storage, ground storage, rail cars or trucks, etc.

The bulk plant has been designed so that it may be constructed in four phases, each phase providing necessary facilities as additional business is developed for the terminal.

The first phase, costing an estimated $1 million, will consist of facilities to permit unloading of bulk material and delivery to Bestwall Gypsum and to rail cars, truck, barges or conveyors serving adjacent industries.

These facilities include:

¶ A dock 500 feet long and 30 feet wide with a water depth of 36 feet below Mean Gulf Level, capable of extension.

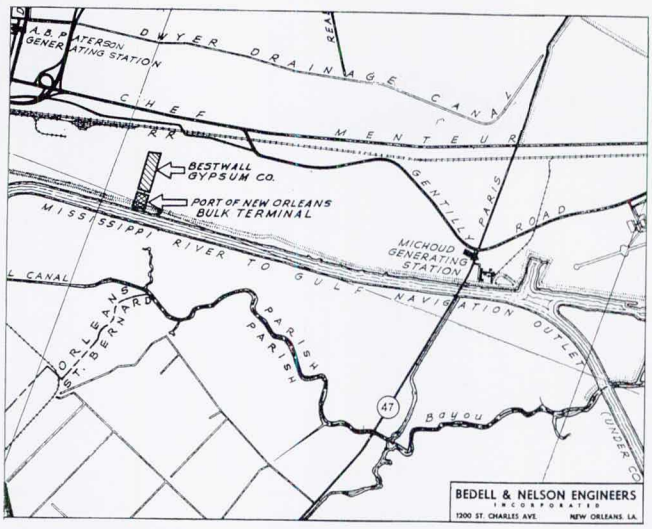
¶ A traveling bulk unloader operating on rails on the dock. Electrically-powered, it has a free digging rate of 530-750 tons per hour discharging by feeder to a dock conveyor.

¶ Necessary conveyors, galleries, transfer towers, handling facilities and power supply.

The new bulk plant serving Bestwall Gypsum will help further the development of the gypsum facility—and the growth of Bestwall itself, one of the fastest-moving companies in its field.

Inspecting the Bestwall plant site were Rawson G. Lizars, company president; New Orleans Mayor Morrison; T. J. Smith, president, Board of Commissioners, Port of New Orleans; George S. Dinwiddie, International House president, and William Zetzmann, International Trade Mart president.

Sen. Allen J. Ellender said that industry is watching the Gulf Outlet area as a site for future plants. "New Orleans is a gateway to South America as well as to the northern inland water routes." "Industry will grow and prosper along this water outlet in the years to come,"



Exact location of new plant, and Port's bulk plant, are depicted on map (above).

he added.

"Before too long we can expect to see industrial plants side by side up and down this canal," said Mayor Morrison, who presented honorary citizenship awards to Lizars, Executive Vice-President Malcolm Meyer, and E. A. Diefenbach, Assistant to the President.

Representative Hale Boggs of New Orleans said: "It has been less than five years since talk began on the possibility of building the Mississippi River outlet to the Gulf. It is an inspiration to realize that the project is three or four years ahead of schedule, and that construction of industries is already starting on this channel."

"We will put forth our very best effort to make good citizens," said Mr. Lizars, responding to the City's welcome.

—o—

NSPE

(Continued from Page 10)

zona who maintained that the bill "misleads the public," although he did concede that it is "immeasurably better" than the bill approved by the Senate Labor Committee. Perhaps the most significant change made in the bill on the Senate floor was the inclusion of a compromise version of Senator McClellan's "Bill of Rights" for labor union members.

Most of the general Taft-Hartley amendments in the bill were left untouched, including the controversial "construction industry amendment" with which NSPE has been most seriously concerned, inasmuch as that language could prove seriously detrimental to the separate voting rights of professional engineers employed in the construction field. However, although the bill does not contain the safeguards recommended by NSPE, **the Senate Labor Committee did declare with respect to the construction industry provision:** "This subsection, moreover, in no way modifies other provisions of the statute with respect to special types of employees such as professional employees. Thus it is neither the intention nor effect of the bill to affect the status which professional engineers now enjoy under the statute."

Protests Fee Limitations

In a statement to the members of the Senate Appropriations Committee, NSPE characterized as "unreasonable, unrealistic and arbitrary" a provision in the House-passed Interior Department appropriations bill for fiscal year 1960 (H. R. 5915) which places a **limitation on engineering and design costs of 5 per cent of the total cost of any construction project.** This limitation has not been included in any previous appropriation bill.

—o—

Suit

(Continued from Page 7

The Editorial Staff of The Louisiana Engineer cannot speak for the Louisiana Engineering Society in this case but would point that:

1) It shows once again the need of bringing to the public's attention the role of the engineer, his responsibility and the limits of liability in his work.

2) This, in turn, points up that the individual engineer today is more frequently coming in contact with a host of non-engineering problems that it is in his interest to be cognizant of and know how to deal with.

3) Certainly, the exchange of information about these non-engineering problems will ultimately prove helpful to the engineering fraternity as well as the general public which the profession serves.

(Further details of this case will be reported as they develop—Ed. Note).

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Cities Service At Lake Charles

Develops Light Ends Recovery

By R. S. FREEMAN

The petroleum industry is a highly competitive and technical industry, one which requires modern refineries and processes. If a refinery is to remain modern and enable the company to maintain and strengthen its position in the industry, management must continually study the changes in the market and plan for the future. This, in most cases, requires capital investment expenditures amounting to millions of dollars. Such a program is exemplified in the light ends recovery program of the Cities Service Refining Corp. at Lake Charles, La.

This refinery was originally constructed in 1943 and early 1944 complete with all of the necessary processes to fulfill its designed purpose: To produce maximum aviation gasoline, feedstock for a synthetic rubber plant, and large quantities of high quality petrolm products for civilian use.

It performed a creditable job in this task and did a large part in keeping our bombers flying during the war.

In the post-war years, although there was still a considerable demand for aviation gasoline, attention was more and more being diverted to a peacetime market, a market which might possibly be more accurately called a "cold-war" market.

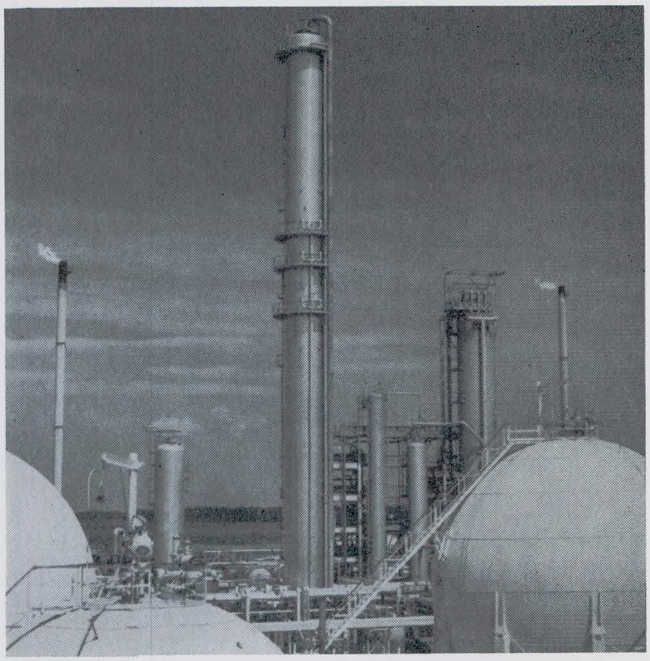
However, Detroit turned attention once again to the citizen consumer and soon cars were rolling off production lines in prodigious numbers. In addition to quantity, these cars were being produced each year with higher compression engines which required automotive fuels of increasingly higher octane ratings. Also, vehicles using liquified petroleum gas (LPG) as fuel were becoming more numerous and the use of LPG for cooking and heating in the home was creating a rapidly growing market for this product.

Favorably Situated

The Cities Service Refining Corp. was in a relatively favorable position to meet the increasing octane requirements due to having Alkylation Units and having added a Catalytic Reformer along with other facilities in the intervening years. Studies of future markets showed that the demand for liquified petroleum gases were rapidly expanding and that our existing facilities could not meet our potential market. They also showed that substantial storage would be required due to the seasonal market for this product.

In addition to the LPG picture, a program under way for upgrading some of the low value products produced from a barrel of crude into aviation and motor gasoline, which necessitated obtaining additional iso and normal butane. A study of the availability of isobutane showed the necessity for installing an Isomerization Unit to supply a substantial amount of our iso requirements. Also,

Mr. Freeman is Technical Assistant to the General Supervising Engineer of the Cities Service Refining Corporation at Lake Charles, Louisiana.



Butane Splitter Tower and Isomerization Unit at Cities Service Refining Corp. at Lake Charles are key features of light ends recovery program. Tower, 208 feet tall, is among largest of its kind ever erected.

due to the varying seasonable requirements for normal as a motor gasoline blending agent, it became economical to provide underground storage for this product.

Flexible Plan Developed

An over-all plan was developed to enable the refinery to resolve this situation by an integrated plan which utilized all refinery products and available outside components in a very efficient manner. Incorporated in this plan was a flexibility consistent with the varying conditions demanded by the seasonal markets.

The details of this program were quite numerous, but the major items included underground storage facilities for both butane and propane, surface storage for propane, a Butane Isomerization Unit, a splitter tower to sparate iso and normal butane in field grade mixes, a depropanizer tower for additional propane production, a de-ethanizer tower for required purity, and the necessary facilities for shipping and receiving these light end materials.

As early as 1951 the search began for suitable locations for underground storage facilities near the refinery. Several salt domes of a suitable size and structure were found and a final selection was made on the West Hackberry salt dome, some 15 miles southwest of the refinery. To date, four wells have been drilled and washed out to a capacity of some 250,000 barrels each, with plans for drilling additional wells as required. Two pipelines connect these wells to the refinery.

These storage facilities are an important part of the program for two major reasons. One, butane is blended into gasoline to meet requirements on volatility. During the winter months, the gasoline must be more volatile than during the summer months to insure the motorist of quick starting and efficient performance. This, of course, increases the demand for butane during the colder season. These storage facilities permit its storage during periods of lesser demand so that it will be available in sufficient quantities when needed.

Need For Storage

Also, in meeting the market demand for LPG, it was necessary to separate the propane from the other light ends streams. This product was previously, to some degree, being used as fuel gas and for other inner-refinery processes. Therefore, it became obvious that storage facilities would be required if it was to be separated in large quantities and marketed as a commodity in itself. While propane can be stored in surface vessels, it is very impractical to provide the large amount of seasonal storage required by this means.

When the propane was previously being used primarily within the refinery, as a solvent in Deasphalting and as a fuel gas in refinery furnaces, it was not required in a form of sufficient purity as would be required to place it on the market as LPG. To do so it became necessary to install facilities which would effect its separation from the other light ends to a degree of purity that would meet the specifications for a fuel to be used in vehicles and for home consumption. It was also necessary to increase the quantity recovered.

De-Ethanizer Tower

To meet the first requirement, in addition to other considerations, a De-ethanizer Tower was installed in the Gas Fractionation Unit. The Gas Fractionation Unit receives as foodstock the total production of gas and light distillate from the Catalytic Cracking Units and originally had no de-ethanizer. The ethane-ethylene removed by the de-ethanizer constitutes the foodstock to be processed into petrochemicals. The installations of a new Debutanizer Tower lightened the load on the other fractionating towers in the Unit and consequently permitted a more efficient separation of the propane-propylanes, butane-butenes, and light catalytic gasoline. As in the past, the butane-butenes become feedstock for a process butadiene, an intermediate in the production of synthethic rubber. This process returns the butane-dimer mix to the refinery for use in the alkylation process. Also, as in the past, the propane-propylene enters the propylene alkylation process from which the propane, being inert to the reaction, goes to the Depropanizer Tower. This Depropanizer Tower receives a feedstock of 650 barrels of liquid feed and 170,000 cubic feet of gas per hour. The charge is composed of some 28% propane, 60% isobutane, and 12% normal butane. Its overhead product is in excesse of 98% propane.

Producing Isobutane

In the production of alkylate, used for blending high octane aviation fuels, isobutane is reacted with normal butane or propylane, in the presence of sulphuric acid to form a branched chain aliphatic hydrocarbon which possesses the high octane characteristics. In the case of butane alkylation, both the isobutane and normal butane are needed in large quantities and relatively pure form. While they are both present in the light ends produced from the other refinery processes, such field grade butane mixes are not entirely suitable for alkylation feedstock. Therefore, a butane splitter tower was installed to separate the isobutane from the other components in these field grade butane mixes and also in the Isomerization Unit effluent. This produces sufficient quantities of isobutane for alkylation and normal butane for gasoline blending.

The Butane Splitter Tower is among the largest ever erected, being 208 feet tall with an inside diameter of 13.5 feet and weighing some 215 tons.

It was fabricated in a shop 150 miles from the refinery site and, requiring six flatcars to transport it, is reputed to be the longest single item ever shipped by rail.

To this tower is charged 25,000 barrels per day of mixed butane from which it produces an overhead product rich in isobutane and a bottom product of essentially pure normal butane. As stated, the isobutane goes to the alkylation process; and, while most of the normal butane goes directly to storage for gasoline blending, some of it will go as feedstock to the Isomerization Unit.

The Isomerization Unit receives in excess of 14,000 barrels per day of normal butane from the splitter tower and converts better than 4,000 barrels of it to the isomer. The total production of the Isomerization Unit is in turn fed back into the splitter tower for separation. A portion of the unconverted normal butane will, as mentioned above, be recycled to the Isomerization Unit. Thus, the more valuable isobutane is diverted from uneconomical use as a blending agent in gasoline and the less valuable normal butane is isomerized, as required, for alkylation.

Uses of Methane

Of the light and materials produced, only methane has not been mentioned; however, it does not go to waste but is used as a refinery fuel gas to heat the furnaces and boilers required to keep the many processes going. It is further interesting to note that the tail gas from the Catalytic Reformer, which is rich in hydrogen, is used as a feedstock for still another process to produce ashydrous ammonia. This product has gained wide acceptance as a commercial fertilizer because of its nitrogen content.

This is how a modern refinery with progressive management is able to keep abreast, or ahead of a highly competitive market served by an equally highly technical industry. It exemplifies the technical progress which has made possible the efficient recovery, and the utilization of gases which not too many years ago were wasted. It is an example of how the technical ingenuity of man continues to make the products of nature more useful to all.

* * *

(The author wishes to acknowledge the assistance of Mr. C. R. Griswold, Technical Superintendent of Cities Service Refining Corp., who reviewed this paper for publication.)

Memorials

CHARLES SAMUEL WILLIAMSON, JR.

A native of Tennessee, where he was born in 1879, Charles Samuel Williamson, Jr. attended Vanderbilt University receiving the B. S. degree in 1902 and the M. S. degree in 1903. During his college days he was active in many phases of college life and also served as a teaching assistant in chemistry. After graduation he spent five years as an industrial chemist and bacteriologist before entering the teaching profession. He found time for further graduate study at the University of Chicago while filling teaching positions at Wofford College in South Carolina, Michigan State College and Alabama Polytechnic Institute. In 1913 he accepted the position of Associate Professor of Industrial Chemistry at Tulane University, and in 1916 he was promoted to Professor of Industrial Chemistry and Head, School of Chemical Engineering. In 1931 his title was changed to Professor of Chemical Engineering and Head, School of Chemical Engineering. On his retirement from Tulane in 1945 he was awarded the title of Professor Emeritus of Chemical Engineering.

Professor Williamson was ever interested and active in the affairs of the Louisiana Engineering Society. During the many years of his membership which culminated in his election to Life Member in 1946 he was a faithful attendant at the monthly and annual meetings. He served the Society on numerous committees, on the Board of Direction and in the office of President for 1937. He was one of the founders of the New Orleans Section of the American Institute of Chemical Engineers and served as its chairman for many years. He was also a founding member of the Louisiana Beta chapter of Tau Beta Pi.

The Louisiana Section of the American Chemical Society was another organization which Charlie Williamson served well not only as chairman but on many of its committees. In 1955 he received from the American Chemical Society a citation as a fifty-year member and thus became a life member of that organization. He was also a Fellow of the American Institute of Chemists.

For nine years he was a member of the Accrediting Committee of the American Institute of Chemical Engineers which was such a powerful force in upgrading engineering education throughout the nation. His was the distinction of being the only southerner on this committee during his term of service.

Whereas the members of the Louisiana Engineering Society feel a deep sense of loss in the death of this valued and respected member who served the Society so well and so faithfully for many years, and

Whereas his devoted service to the teaching and practice of Chemical Engineering, and to the many related professional societies, constitute a record worthy of memorialization.

Bt It Therefore Resolved, that the membership of the Louisiana Engineering Society express hereby its gratitude for the esteemed services of Charles Samuel Williamson, Jr. and its feeling of loss at his passing; that these resolutions become a part of the minutes of the Louisiana Engineering Society; and that a copy be sent to Mrs. Williamson and to each of his two children, Charles S. Williamson and Almira Williamson Fincher.

Respectfully submitted,

A. Lee Dunlap
John K. Mayer
Francis M. Taylor, Chairman

Co-Authors Paper Given Before AIChE

A Tulane engineering graduate, Leon G. Barnett, Jr., co-authored a paper presented at the national meeting of American Institute of Chemical Engineers in Kansas City recently.

Entitled "Effect of Mass Transfer on Solid-Catalyzed Reactions—The Dehydrogenation of Cyclohexane to Benzene," it was written while Barnett was a graduate student at Tulane University.

Dr. R. E. C. Weaver presented the paper; he and Professor M. M. Gilkeson were the other authors.

A member of Research and Development Division of Humble Oil & Refining Co. at Baytown, Tex., Barnett holds the B. S. and M. S. degrees in chemical engineering from Tulane, in 1956 and 1958.

Mr. and Mrs. Barnett and their two children live in Baytown at 511 East Humble St.

Gulf Institute Selects Alfred G. Rayner

Alfred G. Rayner, consulting engineer of Baton Rouge, La., has been named president of the Gulf Institute of Consulting Engineers.

Mr. Rayner holds a B. S. degree in civil engineering from Tulane Uuniversity, and is licensed in engineering and architecture in the State of Louisiana.

Other officers include: T. Edward Ernst, New Orleans, first vice-president; B. M. Dornblatt, New Orleans, second vice-president; and John P. Jones, Baton Rouge, secretary-treasurer.

Organized in 1950, the Gulf Institute of Consulting Engineers is a professional organization, whose members are registered private consultants in the fields of civil, mechanical, electrical and chemical engineers. Membership covers the four-state area of Arkansas, Louisiana, Mississippi and Alabama.

The group recently held its annual meeting in Baton Rouge.

This year marks the completion of twenty years of United Gas advertising to encourage the location of industry in the "Gulf South." Nearly 200 pages have been published in such national magazines as TIME, NEWSWEEK, UNITED STATES NEWS & WORLD REPORT, BUSINESS WEEK and the WALL STREET JOURNAL.

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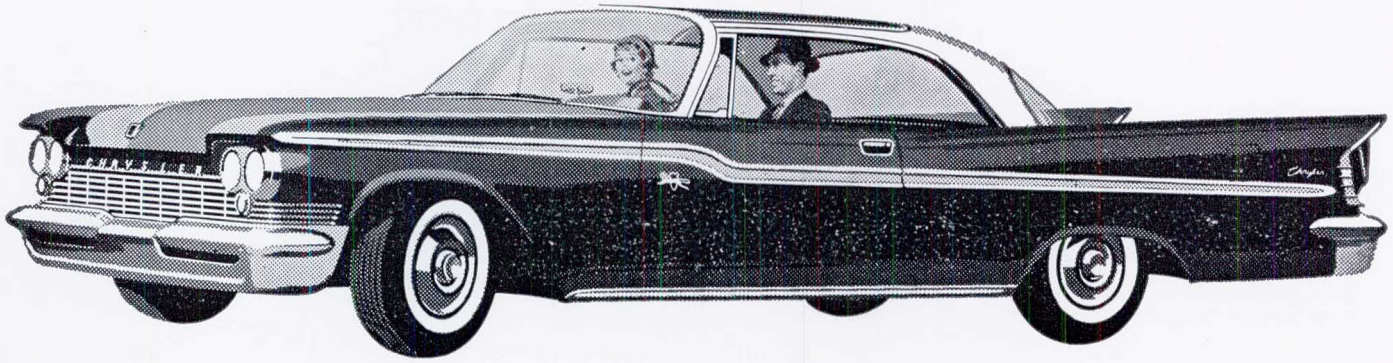

Come in today—ask about our "Step-Up" appraisals



Jewella St. is now a modern divided route between Greenwood Road and Lake Shore Drive in the western section of Shreveport.

Expressway In The Works

Shreveport's Planning for Traffic

By H. LANE MITCHELL

Shreveport, La., second largest trade center in the state, is planning and building on a large scale to meet its rapidly mounting traffic demands. In only 10 years motor vehicle registrations have more than doubled. The future may bring an even greater increase in traffic.



H. Lane Mitchell . . . cites advance

To keep up with its rapid growth, the city has built several street improvement projects and other are either in the planning or construction stages. The Shreveport Department of Public Works is responsible for planning and building most of the city's new streets. However, much assistance in some street and road programs, and in the improvement of roads that approach the city, is provided by the Louisiana Department of Highways. Federal- aid and state highway funds have also helped on projects where such funds were available.

Most of Shreveport's recent traffic-relief programs have been financed by a $5.6 million street-bettermen allocation that was part of a $19 million capital-improvement bond issue approved by property owners in 1955. Some money was available from a 1947 bond issue.

To supplement those funds, in line with the policy of the city for 50 years, owners of property along some of the street projects were given direct paving assessments. Where new paving was involved—that is, on a street that had not been paved previously—abutting property owners on each side were assessed for about 30 per cent of the cost.

The photograph (above) shows one of a number of traffic-relief projects that have already been completed and put into service. The biggest and most ambitious project, however is still in the planning and building stages. It is the Shreveport Expressway, a 3½-mile $50 million undertaking that will provide a planned-access route from the outksirts of Shreveport and Bossier City through the central business district of each city. The expressway and some of its important connections will be built as a part of the Interstate System under provisions of the Federal-Aid Highway Act of 1956.

H. Lane Mitchell is in his 25th year as commissioner of public works in Shreveport, La. He is a Registered professional engineer, and a member of the Louisiana Engineering Society, the American Society of Civil Engineers, the American Public Works Assn., the American Road Builders' Assn., and the American Assn. of Airport Executives. This article first appeared in "Concrete Highways," published by Portland Cement Assn.

———o———

There is no need for the manufacture or use of artificial fuel in Louisiana because of the almost inexhaustible supplies of natural fuel.

* * * *

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* * * *

In recent years in Louisiana, surplus gas has been conserved by recycling processes. This has all but eliminated the burning of exhaust flares.

* * * *

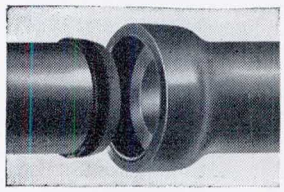
An increase in every major category except general cargo exports, was reported for April at the Port of New Orleans. The overall tonnage gain was 22 per cent.

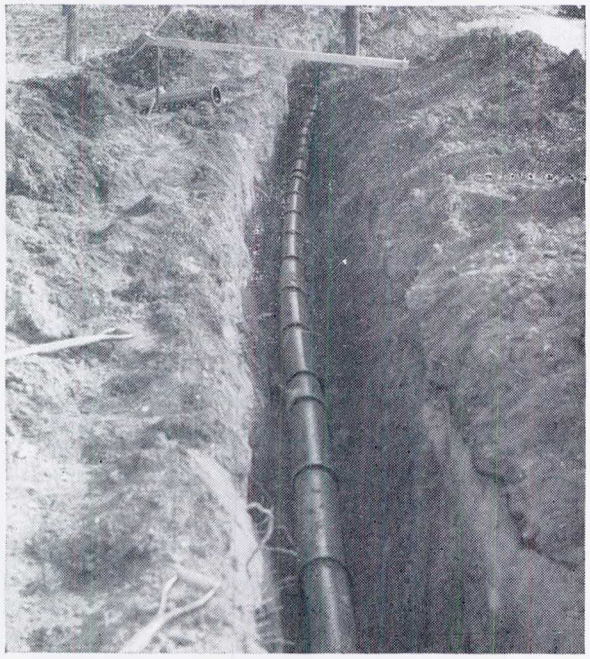
* * * *

Completion of a new $289,000 dressed, finished lumber mill in Winn Parish has been announced by Hunt and Sons Lumber Co. The new plant will provide work for 75 employees.



Ted Moore,
Superintendent,
Sewer & Water Dept.
Bowling Green, Mo.





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AIEE Marks 75th Year

Electrical Engineer Works Wonders

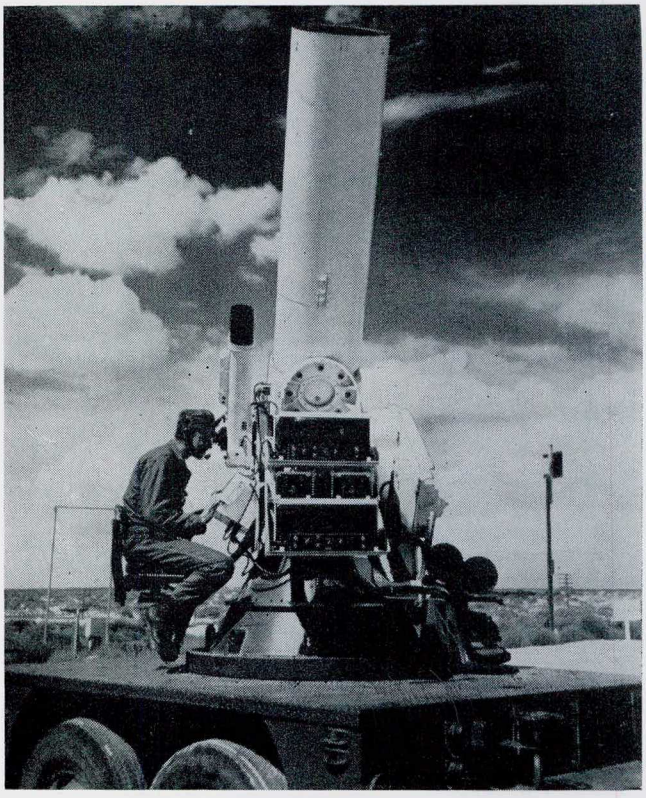
Seventy-five years ago New Orleanians changed horsecars at Canal St. and Royal. Today we are just about to board a space vehicle for the moon.

It is no exaggeration to say that in the past three-quarters of a century man has been through his most fabulous period in the conquest of nature, and a chief architect of the modern world has been the electrical engineer. His art has made electric power the very life blood of civilization. With each advance, the role of the electrical engineer becomes more vital. He has well been called the Indispensable Man.

Electricity has a role in the preparation or operation of everything we use, everything we wear, everything we eat or drink.

But we have just learned to use this mysterious source of energy. We are on the threshold of new wonders, made possible by electricity through the art of the electrical engineer.

In the celebration of its 75th Anniversary this year, 1959, the American Institute of Electrical Engineers can be pardoned for recalling some of the miracles that have come to pass in the past three quarters of a century, through the use of electricity. But by and large AIEE is looking forward, toward the horizon of tomorrow and tomorrow's tomorrow.



Electronic controls serve to guide the weapons—and the peaceful equipment—of the future. They are made possible by electricity through the art of the electrical engineer.

In 1884, when the Institute was first organized, only 71 men—Thomas Edison and Alexander Graham Bell among them—were members. What progress those men and their disciples made!

Already, in 1884, the telegraph spanned the continent, and crossed the Atlantic. Electric fire-alarm and burglar-alarm systems were in common use. The electric light was a novelty, and the telephone was in a crude stage of development. Edison had built an experimental electric locomotive, but no railroad would buy it. Horses and mules were the chief source of work energy, and sweating humans helped the beasts.

Today, machines—nearly all powered wholly or partly by electricity—do 96% of all work requiring physical energy. The electrical industry, which employs 100,000 electrical engineers, accounts for one-eighth—roughly $60 billion worth— of total industrial production. Five per cent of the nation's working force is directly employed by the electrical industry.

Electrical engineers can take much of the credit for the vast advances in communications during the past 75 year; radio, TV and modern telephones are products of electrical engineers.

To electrical engineers also go plaudits for successes in the field of electronic devices. Airplane, radar, automatic elevators and electronic "brains" that "think" a million times faster than a man—these are just a few electrical engineering accomplishments.

Producing **power** is one of electrical engineering's most impressive feats. To equal the electrical power that America uses in just one year, 100,000 horses—working 20 hours a day, seven days a week—would have to keep going for years! And in the area of national defense, the services of the electrical engineer are vital to equipment ranging from the jeep to the guided missile.

In spite of all these accomplishments—and though America uses nearly as much electrical energy as the rest of the world combined—our country is short of electical engineers. Some guess that Russia is graduating twice as many electrical engineers as we graduate each year. But speculation aside, electrical engineers **know** that the field of electronics, communications and power are still in their infancy!

Will electrical engineers learn to create perpetual "sunlight" over farmlands? Build "fences" of sound waves instead of materials? Melt dangerous icebergs with invisible rays? Create a communications system that transmits scents and heat as well as sounds and visual images? Build a **creative** electronic "brain" by learning to duplicate the electrical impulses discharged by the brain of a human genius?

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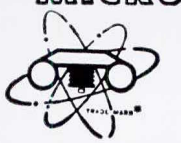

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INDEX OF ADVERTISERS

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W. S. Dickey Clay Mfg. Co. 23
Equitable Equipment Co., Inc. 17
Eugene Dietzgen Co. 26
Golden Anderson Valve Specialty Co. 6
Gulf States Utilities Co. 6
Allan J. Harris Co. 26
LeBaron Motor Co. 21
A. M. Lockett & Co., Ltd. 27
Louisiana Power & Light Co. 26
McLellan Equipment Co. 11
Menge Pump & Machinery Co., Inc. 17
New Orleans Blue Print & Supply Co., Inc. 25
T. Pittari's 11
Portland Cement Association 2
Professional Listing 12-13
Reagan Equipment Co. 6
Shilstone Testing Laboratory 28
Southern Bell Telephone & Telegraph Co. 25
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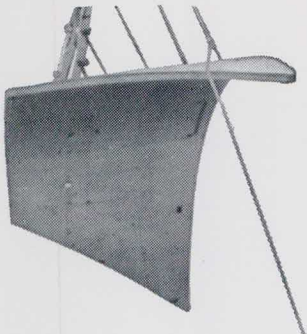

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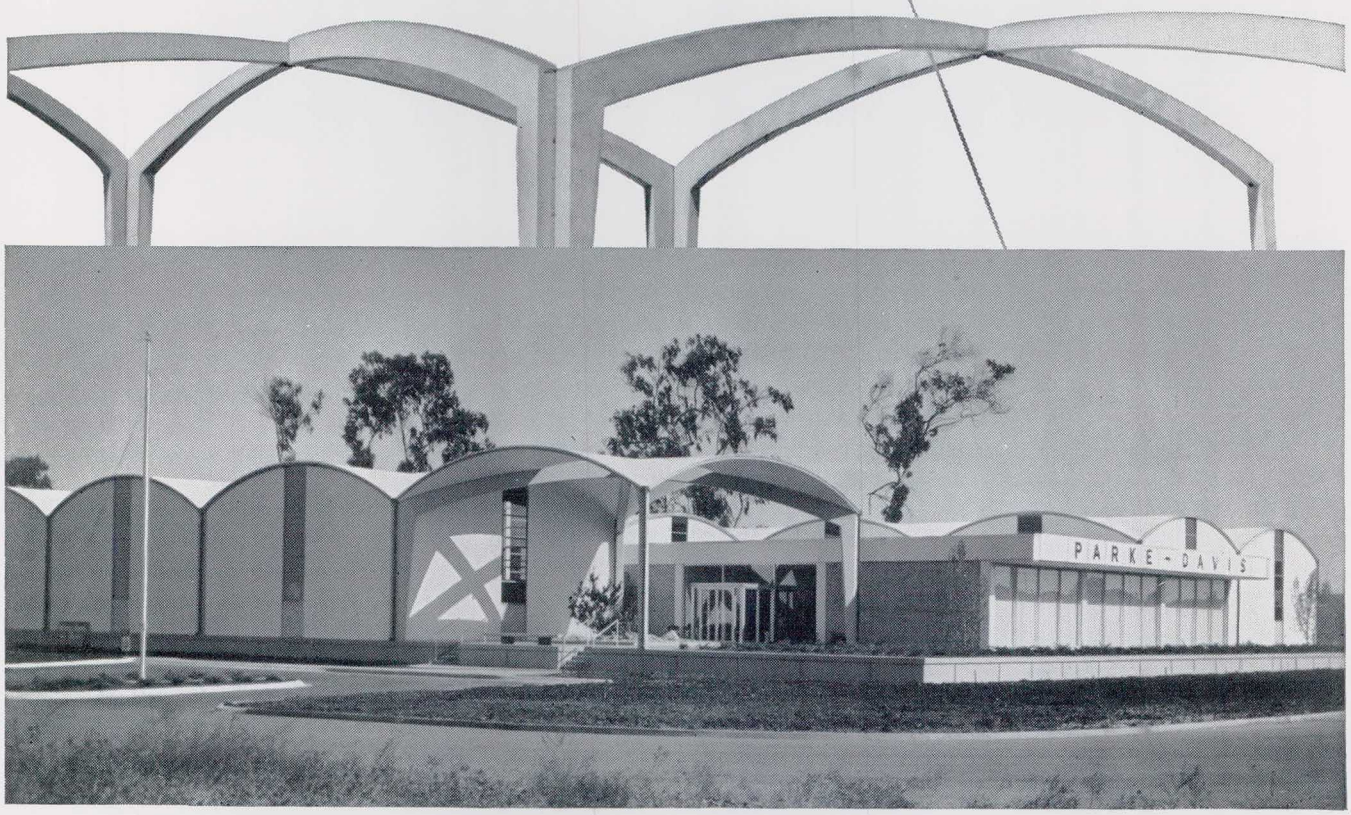

Beauty is good public relations, agreed officials of Parke, Davis & Company in planning this combination office and warehouse in a restricted industrial area in Menlo Park, Calif. To achieve this beauty, and fill practical needs as well, concrete was chosen for the whole job.

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THE LOUISIANA ENGINEER

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CONTENTS

	Page
LES OFFICERS, STANDING COMMITTEES	4
LES MINUTES, NEW MEMBERS	5
REPORT ON LA. OIL INDUSTRY	8
FIELD NOTES; NSPE, EJC NEWS	10
PROFESSIONAL ENGINEERS GRANTED REGISTRATION	11
WHAT EVERY PROFESSIONAL ENGINEER SHOULD KNOW	12
PROFESSIONAL LISTINGS	12-13
UNITED ENGINEERING CENTER	14
RATHBONE TO ADDRESS B. R. COUNCIL	16
LES PRESIDENT WINS STARS	17
INJURY PROTECTION	18
BATON ROUGE PROSPECTS	22
SEALED CIRCUITS	23

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***OUR COVER:** The new $10 million United Engineering Center in New York City, which begins going up October 1, 1959. It is scheduled to be ready for occupancy March, 1961, to stand as a monument to a proud and noble profession. The structure will be 18 stories high.*

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We feel that you, as a reader of The Louisiana Engineer, are entitled to a measure of service beyond the mere presentation of engineering articles and news.

The service we refer to has to do with the individuals and companies who advertise in this publication.

So that you, a busy engineer, may be relieved of the necessity of performing your own investigations, the Louisiana Engineering Society is assuming part of this responsibility for you by accepting advertising only from proven reliable companies. By this, we do not intend to infer that these are the only reliable ones, but we do point out the fact that, from our knowledge of past performance, you may, in our best judgment do business with our advertisers with complete confidence.



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Letters

As a matter of publication policy this section of The Louisiana Engineer will be reserved for communications from readers who write us with comment, advice and even criticism —and we hope news of their own activities. However, upon assuming his new duties your Editor was pleasantly surprised to receive messages of congratulations from many old friends and associates. Personal acknowledgement and greetings have been sent to all who wrote. However, we print excerpts from one or two letters at this time because of their general news interest and as a tribute to the entire staff of The Louisiana Engineer whose skill and diligence makes your Editor's task at once easy and enjoyable.

Many of you will recall with affection Arthur Middleton Hill, formerly of the Tulane Engineering faculty. He writes from his residence at 1835 Sigma Chi Road, N. E. Albuquerque, New Mexico, that on a recent trip to Mexico he ran across Dean Paul Grambsch of the Tulane School of Business Administration, who filled him in on Tulane and New Orleans news. Arthur is working on a wide variety of weapon component programs and would enjoy hearing from Louisiana friends.

Another old friend, known to many of you, writes from Washington, D. C. He is Edward S. Bres, now residing at 5328 Thirty-Eighth Street, N. W. Ed is looking forward to a trip South in the near future and I am sure many of us will enjoy an opportunity of greeting him and his charming wife.

Lastly, the Editor takes pleasure in a communication from Donald Derickson, Chairman, Louisiana State Board of Registration for Professional Engineers and Land Surveyors. His greetings and good wishes are warmly reciprocated by the entire staff of The Louisiana Engineer. It is our hope we will continue to merit approval.—WHR.

La. Engineering Society

Minutes of meeting of the Board of Direction held on Monday, July 13, 1959 at Engineers' Club in New Orleans

The meeting was called to order by First Vice-President McLellan with Messrs. Duclos, Durning, Janssen, Riess and Fernandez present. The minutes of the preceding meeting was accepted as read.

The Secretary reported that 442 ballots were received and that all applicants for membership appearing on the June membership ballot were elected to their respective grades. The Chairman of the Financial Committee presented the semi-annual Income and Expenditure statement which was compared with the budget prepared at the beginning of the year.

The Secretary reported that Mr. Calvin Watts was unable to attend the meeting and in his behalf reported that the Legislative Committee is of the opinion that:

1. Professional Engineers and Land Surveyors should not have separate boards of registration.
2. The Committee favors the provision authorizing the board by injunction with regard to violations of the law.
3. Increase the qualification requirements for registration would be too difficult to get enacted on Louisiana.
4. Committee is agreeable to depleting the grandfather clause.
5. Would like to further study of requirement that everyone performing engineering design must be registered.

Much discussion followed, particularly on item "2" after which Mr. Riess moved that the Secretary be authorized to forward the Committee's report as soon as it is received, provided it substantially agree with the oral report here presented. Motion seconded by Mr. Durning and passed.

Correspondence between Dean Johnson of Tulane University and President Sessums was read after which Mr. Janssen moved that the L.E.S. Scholastic Award be paid up Junior Membership for 3½ years in the Society. Motion seconded by Mr. Riess and carried.

A letter from Mr. James M. Fourmy concerning a pending suit in which the engineer was involved was read. Mr. Riess moved that Mr. Fourmy be advised that the L.E.S. is very much concerned in the matter, that unfortunately funds are not available to employ an attorney but that the Board would be glad to request L.E.S. members to serve as expert witnesses without charge if desired. Motion seconded by Mr. Janssen and carried.

Mr. Duclos moved that the resignations of the following be accepted with regret:

Eugene C. Hawkins	Metairie, La.
Frank H. Harvey	Baton Rouge, La.
Burton L. Thomas	New Orleans, La.

The election of Mr. R. Reinsch was declared void.

New business, including the review of Mr. Billy Hanna's application for membership, designation of signatures for 1960 NSPE membership cards, and the formation of function sections, was tabled in order that the Board could adjourn and the Society's regular meeting could begin on time.

JOHN P. FERNANDEZ,
Secretary-Treasurer.

MINUTES

Meeting of the Board of Direction held on Monday, August 10, 1959 at the Engineers' Club, New Orleans

The meeting was called to order by Vice-President McLellan with Messrs. Bogard, Durning, Freeman, Hargrove, Janssen, Riess and Fernandez present.

Mr. Riess moved that the minutes of the July meeting be accepted as read, seconded by Mr. Durning and carried.

Mr. McLellan reported correspondence and action taken concerning the suit against an engineer in the accidental death of a worker during construction of a sewerage plant.

The Treasurer presented a semi-annual report of income and expenditures correlated to the society's budget.

The Secretary reported on two recent meetings of the Public Relations Committee at which it was agreed that the LOUISIANA ENGINEER pubication had reached a self-supporting status through advertising revenues. Contracts with Allen Johnson & Associates for public relations services at $500.00 per month and for editing of the LOUISIANA ENGINEER at $350.00 per issue were read, each covering the period July 1-December 31, 1959, with option to renew at the same rates for the calendar year 1960. Mr. Durning moved that the public relations contract be accepted, seconded by Mr. Riess and carried. Mr. Janssen moved that the publications contract be accepted, seconded by Mr. Freeman and carried.

Mr. Hargrove reported that the Shreveport Section has had difficulty maintaining an up-to-date membership list, stating that the quarterly reports from Society headquarters are received at too infrequent intervals. A monthly report would be desirable but the Shreveport Section would prefer to know immedately when each member has paid his dues. With this in mind, the Shreveport Section recently passed a motion to instruct its officers to present at the next annual meeting of the Society a request for the local sections to collect dues, retain their portions and forward the remainder to the State organization.

Mr. Freeman moved that Mr. Billy G. Hanna's application be approved for the grade for which he applied, namely Junior Member, and that his name be so placed in the next membership ballot. Motion seconded by Mr. Janssen and carried.

Mr. Janssen moved that the 1960 NSPE membership cards be signed by the incumbent secretary-treasurer. Motion seconded by Dean Bogard and carried.

Mr. Riess moved that the matter of forming Functional Sections be tabled, seconded by Mr. Hargrove and carried.

Dean Bogard moved that the request of Mr. James H. Jenkins for transfer to Affiliate Member be deferred until next meeting, seconded by Mr. Freeman and carried.

The Board then adjourned in order that the Society's regular meeting could begin on schedule.

JOHN P. FERNANDEZ,
Secretary-Treasurer.

New Members

Frank A. Birdsong, New Orleans; Allan B. Cole, New Orleans; Glenn G. Commons, Alexandria; Joe Lamar Davis III, Shreveport; Harold E. Faller, New Orleans; Wallace J. Hall, New Orleans; Edgar B. Hickey, New Iberia; Robert E. McDowell, Shreveport; Charles D. Olivier, Baton Rouge; George O. Phillips, Monroe; John J. Seip, Baton Rouge; William Barret Settoon, New Orleans; Paul R. Waddle, Shreveport; Robert L. Wolfe, Opelousas.

TRANSFER FROM JUNIOR MEMBER

Robert Arundale Warriner II, New Orleans.

AFFILIATE MEMBER

Leroy L. Berlin, Lafayette.

TRANSFER FROM JUNIOR TO AFFILIATE

A. J. Brouillette, Natchitoches.

JUNIOR MEMBER

Billy G. Hanna, West Monroe; Elton Franklin Jones, Baton Rouge; Gail Ted Reiniger, New Orleans.

JUNIOR MEMBER SCHOLASTIC AWARD

Alan Thomas Blackwood, Ruston.



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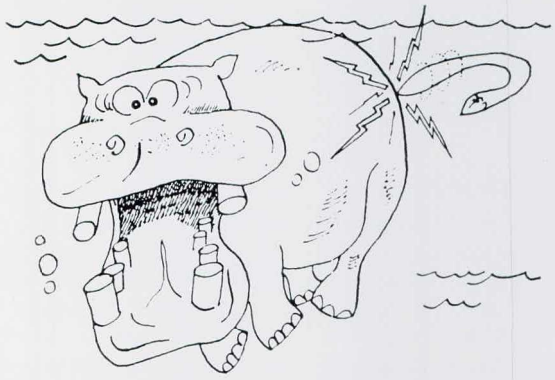

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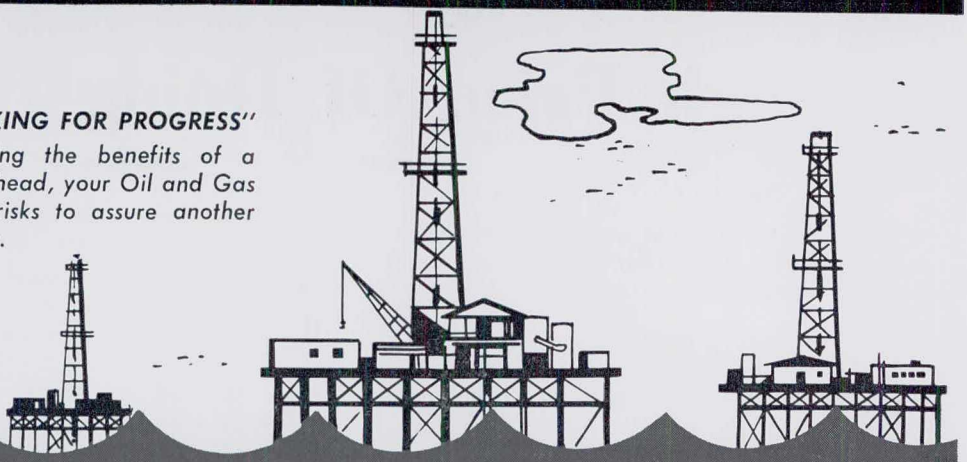

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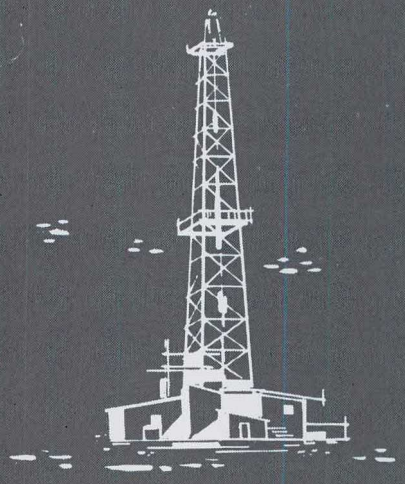

DURING THE PAST 100 YEARS, Oil and Gas have become so important to our economy that they now supply 69% of our nation's energy requirements.

Within the next eight years, this demand is expected to mount to 75%. The demand for Oil itself will increase by nearly six million barrels daily—a 63% increase.

TO MEET THIS INCREASING DEMAND, a healthy business climate must be maintained to afford Oil's investors a return on their huge investments which is commensurate with the risks involved in finding new reserves.

THE CALIFORNIA COMPANY

1111 Tulane Ave. New Orleans, La.

Louisiana's Oil Industry

High Price Of Doing Business

By CHARLIE S. WILKINS

I am somewhat hesitant about addressing men whose professional lives fortunately are governed by the exact science of physics and mathematics. You have the benefit of immutable laws which permit standards of measurement denied those like myself whose technical training is in the field of economics.



The fundamental principles of your profession passed out of the realm of theory many years ago. You can predict what a given combination of circumstances will produce, demonstrate those forces in action, and point to a clear-cut answer.

It is not often so easy for the economist, particularly if he is concerned with a set of circumstances capable of producing widespread effects in areas where he has no means of measurement. Quite often, he could not be sure what he was measuring, even if he possessed the necessary tools. He knows something is happening — but to whom, and in what degree, it is not often possible to determine with any degree of accuracy.

My particular field of interest is the oil and gas industry in Louisiana. We have developed some tangible items by which we can measure the status of this vital segment of the economy. Unfortunately, they do not permit any hard and fast predictions for the future. But I believe they will be interesting to you as engineers, since you are so vitally concerned with the oil and gas industry upon which the Louisiana economy depends.

These measurable items may not be the ones familiar to you through reading newspapers and trade magazines — or even the financial statements of some of the individual companies concerned. Quite often this material is of little importance save as statistics, and bear little relation to the economic forces affecting the industry as a whole.

This is the 100th year since the oil and gas industry came into being in the United States, with the discovery of oil near Titusville, Pennsylvania, in 1859. Oil has been a vital factor in the Louisiana economy since its discovery near Jennings on September 21, 1901.

Today, this industry supplies every drop of fuel used in every internal combustion engine in Louisiana. There are more than one million motor vehicles alone — and thousands of boat motors, stationary engines, many thousands of power lawn mowers.

Equally important, natural gas is used to produce every kilowatt of electric energy used in Louisiana.

There are more than 85,000 persons employed in various phases of the oil and gas industry; another 80,000 — by very conservative estimates — receive substantial income from royalty or lease payments.

Oil and gas, and their products, are responsible for more than half the income derived by the State of Louisiana from state sources. This fiscal year, that income will amount to approximately $316 million out of an expected $615 million in state revenues.

The State of Louisiana imposes the highest oil and gas severance taxes in the nation. Average drilling costs per well are the highest in the nation. Louisiana operations present technical problems not encountered anywhere in the country . . . deep drilling, tremendous underground pressures, difficulties in making locations are only a few of them.

In order to evaluate the status of the oil and gas industry in Louisiana, let us consider two items first of all: Costs, and returns to the operator.

Oil and gas well drilling costs in Louisiana average almost twice as much per foot drilled as the national average. A continuing survey is being conducted by the three leading oil and gas trade associations, the American Petroleum Institute, the Independent Petroleum Association of America, and the Mid-Continent Oil & Gas Association. Of necessity, such a survey will lag behind current cost figures. For instance, 1959 costs are considerably higher than those for 1956, the last year covered by this detailed survey.

In that particular year, average costs in Louisiana were $23.31 per foot drilled. The national average was $12.35. Our neighboring state, Texas, had an average figure of $11.07 per foot drilling and equipment costs.

Louisiana costs had advanced from $17.88 per foot in 1953, when the national average was $12.43 per foot. In 1953, the Texas average cost was $11.95. As you can see, national and Texas averages have decreased, while Louisiana costs are up 30 per cent.

Of course, Louisiana wells are much deeper than the national average. In 1958, the Louisiana figure was 7,671 feet, against 4,019 for the nation. In South Louisiana, the reported average well depth last year was 10,424 feet, and in the offshore areas 9,846 feet.

Drilling and equipment costs skyrocket as the bit goes deeper into the earth. There is no indication that Louisiana can expect anything except continued deep drilling, with the average well depth and average well cost increasing.

Approximately 20 per cent of all money invested in the United States to find and develop oil and gas reserves has been spent in Louisiana over a period of years, the combined industry survey shows. Texas gets 35 to 40 per cent of the money spent in drilling and equipping wells in this country; the remainder is scattered among

Mr. Charlie S. Wilkins, executive vice-president, Louisiana-Arkansas Division of the Mid-Continent Oil & Gas Association, addressed LES on the "Economics of the La. Oil & Gas Industry" at the Engineers Club in New Orleans last month.

the other oil-producing states.

This investment in Louisiana added 1.7 billion barrels of crude oil to proved reserves in the period 1952-58, which was 57 per cent of all the new oil found in the United States. It added 23.66 trillion cubic feet of natural gas, or 39 per cent of all the new natural gas.

These results speak for themselves. So far, they are the only reason for the continuing investment — in one typical year it soared above $625 million — in Louisiana.

In terms of volume of oil and gas discovered, the results are impressive. But let me inject one note of caution: This tremendous investment per dollar spent, is finding less oil and gas than it did in years past. In 1952, the amount of oil added per foot drilled was 16.3 barrels. Last year, it was only 6.66 barrels per foot drilled.

The industry is drilling much deeper, at ever-increasing cost, and finding less new oil. There are strict limitations on the amount of capital available to oil and gas operators. Most of it comes from production income — and this return of capital, on an individual well basis, is achieved at a much slower rate than it was a few years ago.

Let us consider an average Louisiana well, in the 6 to 7,000 foot bracket. In May, 1952, this well was permitted to make 186 barrels of oil per day. It went down to 167 barrels per day in 1953, and has dwindled to a May, 1959, figure of 63 barrels per day.

You can sum up the cost-and-return picture very briefly: Since 1953, the cost of drilling an average Louisiana well has gone up not less than 30 per cent. And since 1953, the operators' income per well has been reduced by more than 65 per cent, due to reduced allowables.

Thirty per cent higher costs . . . paid for out of 65 per cent less money per well. Apply these figures to your own profession; then, I am sure, you will share my concern for the future.

Exploration, drilling and development programs do not happen overnight. They are planned carefully, and money allocated on a basis of anticipated return. If Louisiana becomes less attractive as a source of oil and gas, we can anticipate a shift in capital allotments and more stringent operating economies.

We have a very good illustration of how such economies can come about. In June, 1957, the oil and gas industry had an all-time peak of 44,400 employees on production payrolls. Two years later, it was down to 39,900 — a drop of 4,500 workers. At one time, more than 6,000 were out of jobs.

Company after company is accelerating its retirement program in order to prevent actual layoffs. Replacements are few. I am sure most of you are familiar with the problems encountered by technical personnel seeking employment in the oil and gas industry these days.

Yet every year, we add thousands of persons to our potential labor force. Job possibilities are not keeping pace with the increase in employable workers.

The economic stress also applies to the refining industry in Louisiana. In October, 1952, we had a peak employment figure of 16,222 refinery workers. In May, 1959, there were only 13,900 people employed in Louisiana refineries, a drop of 2,322 from all-time high, and 1,800 less than a year before on the same date.



FIRST PERMANENT, self-contained drilling platform built by Shell Oil Company off the coast of Louisiana is this huge structure sinking a wildcat well in 72 feet of water in East Bay, Block 42, near the mouth of the Mississippi river. From the bottom of its 460 foot piles to the top of the derrick is 650 feet, equivalent to the height of a 50-story building. It can drill 12 directional wells.

Three refineries were not operating. One was closed for good, reducing the market in Louisiana for crude oil, which is a matter of serious concern to all of us.

Layoffs also extended into corollary industries. One Baton Rouge plant has cut back its personnel to the point where men with 10 to 12 years service had been laid off—with no liklihood that the company would ever expand its operations and rehire them.

Abandonments of former producing oil wells increased sharply. This always indicates that costs have overtaken financial return in some wells which still could produce oil—but not profitably, under today's conditions.

Louisiana is in competition with every other oil producing state. Unlike some of its competitors, notably Texas, it is limited to available markets. Louisiana refineries process 55 per cent of the crude oil produced in this state. But in 1958, we were marketing 354,000 barrels of oil per day outside Louisiana. Almost 30 per cent of our total production went to Texas refineries. The Midwest takes a small quantity of Louisiana-produced oil, and the East Coast about 15 per cent of the total.

In other words, more than 45 per cent of the oil produced in this state must compete for a market with Texas-produced crude. Not only does Texas crude reach Louisiana refineries, it is in competition at the refinery

(Continued on Page 19)

Building — Field Notes
By Allen Johnson

Ground-breaking for the new United Engineering Center on United Nations Plaza in New York City October 1 is a significant step for the entire engineering fraternity. Said Charles F. Kettering about the structure: "Today, the significance of unspecialized engineering is being recognized as never before. The engineer, therefore, neds an adequate platform from which to expound his efforts as a creator for economic and social values. He needs a symbol of his dynamic purpose.

"The new United Engineering Center, a focus of life for sixteen national engineering societies, will provide the platform and the symbol.

"Every engineer has a responsibility to participate in attaining this great objective by making a personal contribution to the United Engineering Center Fund Campaign," he said.

Dr. Kettering's comments on the new Engineering Center are a matter of interest to all Louisiana engineers. At the same time, the Louisiana engineering fraternity will, we are sure, see this project as the forerunner of still another closer to home — the realization of dreams, plans or hopes for a building to house the functions of the Louisiana Engineering Society.

Wherever in the state such a center might be located, it could well serve on a statewide basis the same aims achieved by the United Engineering Center. The engineering profession in Louisiana, obviously, would be served by what Dr. Kettering called "a symbol of its dynamic purpose."

———o———

Construction of a multi-million-dollar natural gas cycling and processing plant in the Weeks Island field in Iberia Parish has begun by the Shell Oil Co. The plant will have a capacity to process 120 million cubic feet of natural gas daily.

* * * *

Th National Sciety of Professional Engineers will hold its fall meeting October 15-17 at the Penn-Sheraton Hotel in Pittsburgh, Pennsylvania.

* * * *

A $712,000 expansion program is underway by the Celotex Corp. at its Marrero plant. The expansion will have facilities for the production of structural insulation and acoustical tile. The new facilities should be in use by the end of November.

* * * *

Construction of a new $2.4 million natural gas cycling plant in Cameron Parish has been completed by Magnolia Petroleum Corp.

* * * *

Construction of a new $405,000 addition to its rope and twine plant in Jefferson Parish has been announced by Plymouth Cordage Co. The new addition, which will provide employment for 35 new workers, is scheduled for completion by the end of 1959.

Starting salary data from 10 leading engineering colleges shows a four per cent gain over 1958 and 10 per cent better than 1957. Averages starting range was $495 to $535, with electrical engineering graduates again showing the top figures — $510 to $550. The annual survey, conducted by *Machine Design* gives the other branch figures as: Aeronautical, $485-$535; chemical, $480-$510; civil, $470-$510; mechanical, $490-$525; industrial, $480-$510; metallurgical, $475-$535. Physics graduates were reported at $500-$540.

Other aspects of the survey revealed that recruiters were more selective in 1959 — the great majority were interested primarily in graduates from the upper 25 per cent of the class. Salary still is not the first concern of the graduate, but it has moved up to second place from fourth place of last year. Type of work offered is still the leading factor. There was also a definite trend in 1959 for graduates to choose companies that are known to sponsor study for advanced degrees.

The survey covered MIT, Columbia, University of Pennsylvania, Leigh, Case, Purdue, University of Michigan, Northwestern, UCLA, and Georgia Tech.

Engineering Teaching

A comprehensive report by the National Education Association, "Teacher Supply and Demand in Universities, Colleges, and Junior Colleges, 1957-58 and 1958-59," provides some interesting comparisons of the picture in engineering and other disciplines. Among new full-time teachers in 1958-59 engineering got 8.5 per cent, compared to 9.6 for fine arts, 9.4 physical sciences, 9.2 for social sciences and 8.9 for English. Among the new teachers in engineering, 15.8 had a Doctor's degree, and 42.9 per cent had less than a Master's degree. Engineering had the second largest number of unfilled teaching positions in the past two years, 172 in 91 institutions, exceeded only by physical sciences, with 253 vacancies in 198 institutions. Engineering schools will need 24,300 new full-time teachers, 1959-70, inclusive, according to present estimates.

Latest information on national expenditures for research and developement in industry have just been made available by the National Science Foundation.

(Continued on Page 21)

Professional Engineers Granted Registration

Aug. 11, 1959—John Ames, Houston; Cater Aplin, Jr., Harrisonburg; H. R. Benson, Jr., Shreveport; Jan A. Benson, Shreveport; Francis L. Bergeron, Crowley; Philip J. Boogaerts, Baton Rouge; Valentin Breaux, Jr., Gueydan; George C. Briley, Jr., Houston; M. S. Brzezinski, Jr., New Orleans; David C. Bullard, Baton Rouge; Travis J. Durham, Baton Rouge; Djalma Ferreira, Houston; James Gaudet, Lafayette; Shirley M. Hedrick, Lafayette; Clyde E. Hodges, Baton Rouge; George R. Jones, Jr., Hammond; Charles LaGrecque, Kingsport, Tenn.; Gerard LeBlanc, Lockport; William R. Milsted, New Iberia; M. Burrell, Jr., Baton Rouge; B. R. Mitchell, New Orleans; William A. Morgan, Shreveport; Thomas Mosley, Marion; W. R. Pitcairn, Jr., New Orleans; P. J. Plaisance, Jr., Bunkie; Julian L. Roy, New Orleans; Jackie R. Salley, Hickman Mills, Mo.; John J. Seip, Baton Rouge; Charles C. Smith, Shreveport; Frank L. Wyatt, Baton Rouge; F. Boyd Callan, Waco, Tex.; James A. Dickson, Jr., Beaumont; Carl Fenske, Houston; Ulysses J. Gajan, Lafayette; Charles E. Haass, Houston; J. C. Kerstens, Denham Springs; R. R. Robertson, Houston; Wilbur Smith, New Haven, Conn., Charles G. Van Dine, Leesville; Anthony J. Zabbia, Ponchatoula.

September 23, 1959—Duane W. Ackerson, New Orleans; Thomas G. Andrews, Houston; C. H. Atkinson, II, Lafayette; Benny J. Ballard, Beaumont; Roger K. Battle, Metairie; Francis A. Becnel, Plaquemine; Leon Bilk, Philadelphia, Pa.; John N. Carmena, Baton Rouge; Charles L. Canfield, Dallas; William H. Carter, Baton Rouge; Dorman J. Combest, Hawthorne, Calif.; Melvin B. Coulon, Chalmette; Paul O. David, Jr., Baton Rouge; Carrol J. Darveloy, Kenner; Otto F. Diettel, Jr., New Orleans; Donald P. Endom, New Orleans; Harry B. Ennis, Baton Rouge; Darrell M. Fink, Metairie; Richard M. Flanagan, Baton Rouge; Walter C. Fowler, Alexandria; Thomas J. Fratar, Scarsdale, N. Y.; Walter G. Frey, New Orleans; Harry Galewsky, Jr., Beaumont; Edward J. Glendening, Oklahoma City; Carl F. Grant, Plaquemine; William F. Hecker, New Orleans; Paul R. Holley, Baton Rouge; Robert O. Imhoff, Wayne, Pa.; George Jambor, Shreveport; William A. Kratzert, Sanford, Fla.; L. Lynn Lally, New Orleans; James J. McCarthy, Downers Grove, Ill.; Albert C. Mitchell, Natchez, Miss.; John L. Montz, New Orleans; Franklin L. Moore, Shreveport; Donald L. Padget, New Orleans; Huey L. Pierce, Bogalusa; Willie T. Taylor, Jr., Baton Rouge; Alfred J. Thomas, Jr., Abbeville; Edward W. Tschirn, New Orleans; Wilburn E. Van Landingham, Heber Springs, Ark.; Emmett J. Warren, Mission, Kas.; Harry L. Viosca, Jr., Metairie; Langfitt B. Wilby, Franklin; F. W. zur Burg, Lafayette; Bobby R. Alvarado, Benton; John C. Crowell, Baton Rouge; Carl Hammarstrom, Clinton, Miss.; Edward C. McGee, Jr., Houma; Francis M. Tessier, Baton Rouge.

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What Every Louisiana P. E. Should Know

(This is the second of a series of articles prepared by the Editorial Staff of the LOUISIANA ENGINEER in which an attempt will be made to answer questions of interest to professional engineers in this area. Where, in certain instances, it becomes necessary to answer questions of a controversial nature, it must be re-emphasized that the opinions expressed are those of the Editorial Staff and do not necessarily reflect the feelings of the Louisiana Engineering Society nor the Louisiana State Board of Registration for Professional Engineers and Land Surveyors.

For obvious reasons, no attempt will be made to go into legal interpretations since, in such matters, ethics dictate that we respect the boundaries of our sister profession. Any other questions our readers might wish to submit, pertaining to the Engineering Profession, will be welcomed by the Editorial Staff —Ed. Note).

Question—How does the Louisiana Professional Engineering Registration Act define an "Engineer"?

Answer—The Louisiana Registration Act defines an "Engineer" as a "Professional Engineer" and further as a person who, by reason of his special knowledge of the mathematical and physical sciences and the principles and methods of engineering analysis and design, acquired by professional education and practical experience, is qualified to practice engineering—as attested by his legal registration as a Professional Engineer.

Unfortunately for our profession, the term "Engineer" has long been used to designate operators of locomotives and stationary equipment. While we do not mean to cast any reflection upon the people in such occupations, in our opinion, this joint use of a designating term has been largely responsible for the unwillingness of the public in general to place professional engineers in the same category as doctors and lawyers. At the same time, of course, there has been no determined effort on the part of our engineering contemporaries to assert their professional status.

To counteract this unhappy misunderstanding, it is hoped that the members of our profession will form the habit of referring to themselves as "Professional Engineers" rather than as just "Engineers" and thus, by degrees, educate the lay public.

Question—What practice is followed by the majority of the states with regard to appointment of professional engineering registration board members?

Answer—In Louisiana and 27 other states, the state's professional engineering society makes nominations or recommendations of board members to the governor who, in turn, makes the appointments. By way of comment, we feel that this procedure is commendable in that it accomplishes two important objectives. First, it tends to keep the registration board in the hands of competent professional engineers, men best qualified to judge the fitness of applicants for registration. Second, it relieves the governor of what might, in many instances, be an unpleasant task involving political pressure.

DID YOU KNOW THAT

Louisiana registers professional engineers and land surveyors under Act 73 of 1950

Fourteen states, including Louisiana, have seven or more engineering registration Board Members

Ten states have five engineers and one to three land surveyors and one to three architects on their registration boards.

Nineteen states have five engineers only on their registration boards

Three states have three engineers only on their registration boards

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Planning For The Future

United Engineering Center Going Up

(Ground will be broken October 1, 1959 for the new United Engineering Center, C. E. Davis, Executive Director of the Center, told The Louisiana Engineer. Details of the project appear below. — Ed. Note)

"America cannot afford to be second best," said the Honorable Herbert Hoover recently.

In maintaining leadership for this country, no group will play a more essential part than engineers — men qualified by training, experience, and ability to meet the demands of an era that will witness technological and scientific progress surpassing anything known heretofore.

Within the last half century the profession of engineering has increased mightily in stature. From the standpoint of numbers alone, membership in the five Founder Societies has grown from 16,000 in 1907 to 197,000. Student members swell the number to a higher count, and this figure approaches 300,000 when members of Associated Societies are added.

The growth of services and activities as coordinated from national headquarters has been equally impressive, particularly during the last 30 years. Student chapters have almost tripled (220 to 605); the number of publications increased over 300 percent to 1640 annually between 1926 and 1956, while the number of meetings, including local section meetings, jumped from 2104 to 8037.

Engineering societies have provided opportunities for teamwork in individual advancement through mutual aid. They have established forums, publications, and a Library for the interchange of knowledge, experience, and new ideas.

Engineering societies have fostered the continuing education of engineers at college and practice levels both on a local and national basis. They have made possible quality and economy in all phases of engineering work by means of standards and codes of construction, operation, testing, and ethical practice.

Today the engineer is shaping events more positively than ever before in world history.

Through their over-all organizations, the societies have achieved a highly cooperative relationship, once symbolized and made effective in the present Engineering Societies Building, given by Andrew Carnegie as "a home for engineers." This relationship is now to be rejuvenated and strengthened in the new United Engineering Center.

Standing as enduring evidence of the unity and strength of the engineering profession will be this impressive 20-story tower surrounded by lower units with an attractive landscape.



GROUND WILL BE BROKEN for the new $10 million United Engineering Center in New York City on October 1. Center is expected to help coordinate nation's engineering effort.

The very design and setting of this new United Engineering Center, to be constructed on New York's United Nations Plaza between 47th and 48th Streets, will bear witness to the ideals, stability, and prestige of engineers.

Containing about 250,000 square feet of floor space, the Center will meet in full all present requirements of Founder Societies and Associate Societies. The design provides for expansion with the continuing growth of the engineering profession and the even greater service essential for future generations.

In keeping with its name the *new Center* is to be *the CENTER* of the engineering profession represented by the Participating Societies. As such, it will improve service to members, facilitate cooperation among societies, provide distinct economies through joint operations, and advance the individual engineer's continuing quest for knowledge.

The spirit of service and self help is traditional with engineers. Surely, in times like these when the western world is in urgent need of engineers working as individuals and as a team, every member of the profession will wish to do his part in assuring the manifold benefits that will result from the creation of this United Engineering Center.

Symbol of a proud profession, the United Engineering Center will, at the same time, be an entirely functional

and useable building.

Everything about the new Center will be designed with a single purpose in mind — efficient, effective, and economical service to member engineers throughout the country.

The Engineering Library, already recognized as containing the most outstanding collection of general engineering literature in the world, will become even more useful to the membership. A major portion of the Library's service to engineers is provided by mail. In the new Center, the Library, with additional space and equipment, can handle the many requests for data and research with greater speed and effectiveness.

Meeting and Conference Rooms. For members of the societies serving on technical committees or attending section meetings or study groups, there will be a sufficient number of rooms so designed as to make these sessions even more productive.

Publication Facilities will strengthen the communication to the members of engineering knowledge by the publications of the various societies.

Displays and Exhibits will inform engineers and the general public of the vital accomplishments of the profession.

Centralized Service Areas and administrative offices will add to the effectiveness of the day-to-day work of the societies in serving their members. The coordination of such activities as duplicating, addressing, and mailing will mean greater efficiency and economy.

Constructed more than 50 years ago, the present headquarters of the United Engineering Trustees, Inc. and the five Founder Societies has literally worn itself out in service to the profession.

This outmoded building at 29 West 39th Street was both attractive and ample in size in the untroubled days when Theodore Roosevelt was President of the United States and the membership of the Societies was but 16,000.

Today the structure is outdated and completely inadequate to the needs of a membership which has jumped to 180,000 and is still growing.

The interior design of the present building is antiquated and wasteful of space. Along with membership growth, the expansion of services to members — including greater library useage, the increasing number of section and technical committee meetings, and other activities — have long since exceeded the building's possibilities.

Moreover, there is no way by which additional accommodations can be provided for the various Associate Societies that are desirous of having their headquarters in the building.

Intensive study by the Trustees has established the fact that rehabilitation of the present structure is impracticable. Since the building is now inadequate and unuseable, the answer is clear — *a new United Engineering Center must be created.*

The total cost of the New United Engineering Center, including the new site on United Nations Plaza, is estimated at ten million dollars.

Of this amount, approximately two million dollars will be available from the present resources of United Engineering Trustees, Inc. and proceeds from the sale of the existing building and site.

There remains, therefore, eight million dollars.

This eight million dollars investment to further engineering progress is being sought from:

Business and Industry, five million dollars.

Members of the Engineering Societies, three million dollars.

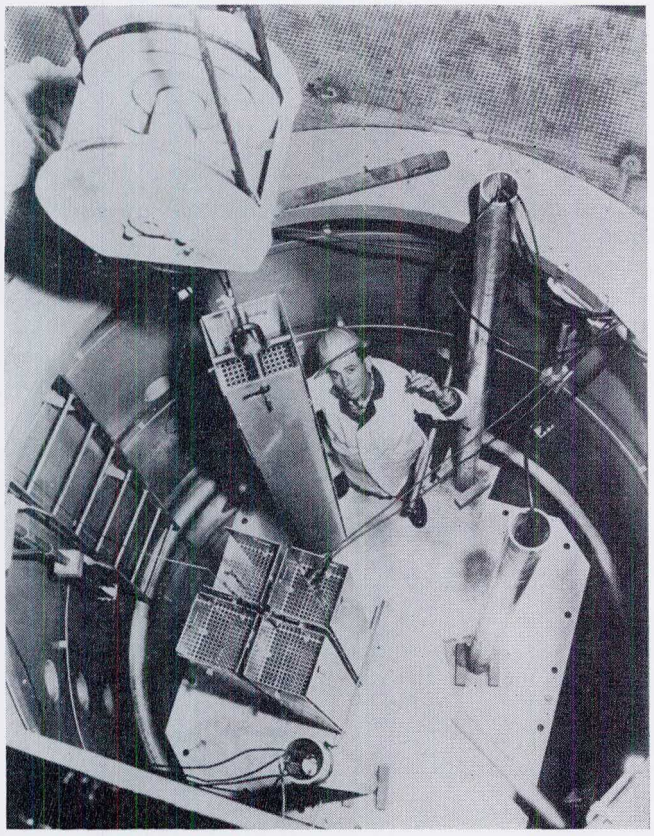
The Industrial Campaign, under the chairmanship of Dr. Mervin J. Kelly, President of Bell Telephone Laboratories, and sponsored by 75 of the nation's outstanding business leaders, has been under way since the fall of 1957 with most gratifying results.

The Member Gifts Campaign, of which Charles F. Kettering is Honorary Chairman and Richard E. Dougherty, General Chairman, is being conducted throughout the entire United States.

Sixteen Participating Societies will have Headquarters in the New Center. They are:

The Founder Societies — American Society of Civil Engineers; American Institute of Mining, Metallurgical and Petroleum Engineers; The American Society of Mechanical Engineers; American Institute of Electrical Engineers; American Institute of Chemical Engineers.

Associated Societies — American Institute of Consulting Engineers; American Institute of Industrial Engineers, Inc.; American Society of Heating and Refrigerating and Air-Conditioning Engineers, Inc.; American Welding Society; Illuminating Engineering Society.



REACTOR BUILDER TECHNICIAN checks fuel element shells for fit in tank of reactor that powers the N.S. SAVANNAH, world's first nuclear powered merchant ship.

Rathbone To Address B.R. Council

M. J. Rathbone, president of Standard Oil Company (New Jersey), will be the guest speaker at this year's annual meeting of the Baton Rouge Council of Engineering and Scientific Societies. A capacity crowd is expected.

As announced by A. W. Holland, president of the council, the meeting is to be held on Thursday, Oct. 29. The theme of the meeting will be "A Salute to Esso Baton Rouge on Its 50th Anniversary."

The Baton Rouge Council of the Engineering and Scientific Societies is an organization formed to make possible a united effort on matters affecting engineers and scientists in the Baton Rouge area. Among other projects, the group sponsors the Baton Rouge Engineers Club and sponsors a united program of counseling for high school students interested in engineering and scientific fields of education.

D. F. Latimer, chairman of the Annual Meeting Committee, said that other speakers will include Lt. Gen. Troy Middleton, president of Louisiana State University; Opie L. Shelton, Executive Vice-President of the Baton Rouge Chamber of Commerce, and Mr. H. C. Leonard, Executive Vice-President of Gulf States Utilities Company.

(Out-of-town engineers may obtain tickets for the meeting from any of the engineering societies that are members of the Baton Rouge Council).

Provides Forum

The annual meeting provides an opportunity for members of the council to get together to hear nationally and world-renowned professional speakers. Jersey Standard's President Rathbone is an ex-Baton Rougean who has advanced to the presidency of the world's largest petroleum corporation.

Rathbone, known as "Jack" to his associates, was born at Parkersburg, W. Vo. Like his father, Monroe Jackson Rathbone, Sr., he received his middle name from history's General Stonewall Jackson. From his oil-man father, young Rathbone also received his early interest in the petroleum business.

A chemical engineering graduate of Lehigh University, Rathbone joined the Baton Rouge refinery of Standard Oil Company of Louisiana, part of the Jersey Standard affiliate now known as Esso Standard Oil Company, in 1921.

His first assignment was as a design and drafting enineer.

Through successive promotions, Rathbone became president of the Louisiana company. Along the way, he served as a construction engineer, assistant superintendent, general superintendent, assistant manager of manufacturing, and vice-president and general manager.

Saw Refinery Develop

While at Baton Rouge, he saw the refinery grow into a large, integrated refining and petrochemical plant, the first to produce commercial-scale butadiene from petroleum, the first producer of Butyle rubber, the first to produce high-octane gasoline by the fluid catalytic cracking process and many other unique accomplishments.

In 1944, when the Louisiana company was merged into Esso Standard, Rathbone went to New York as president of Esso. He remained in that post until his election to the Jersey Standard board of directors in 1949.

After slightly more than four years on Jersey's board, he was elected president of the corporation on Jan. 1, 1954.

Serves Industry

During most of his career, Rathbone has worked extensively with oil industry committees, and is a director of the American Petroleum Institute. He also has assisted government organizations seeking solutions to problems in the petroleum field.

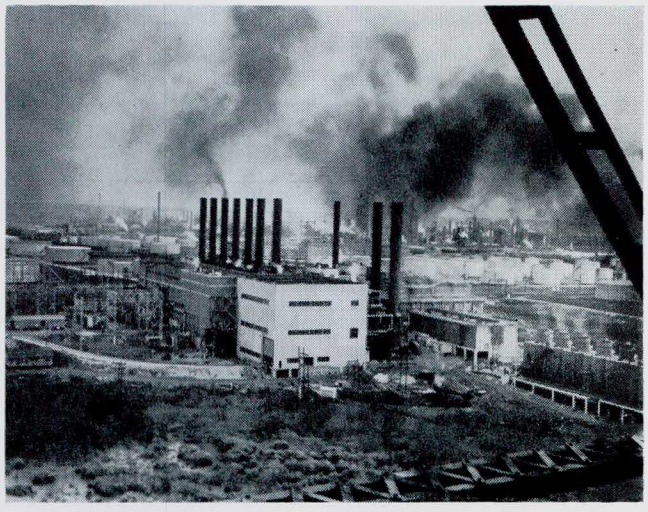
He takes a continuing interest in education and American youth development. He serves on the national executive committee of Junior Achievement.

Also, he is past president of the Lehigh Alumni Assn. and was elected president of the university's board of trustees in June of 1957.

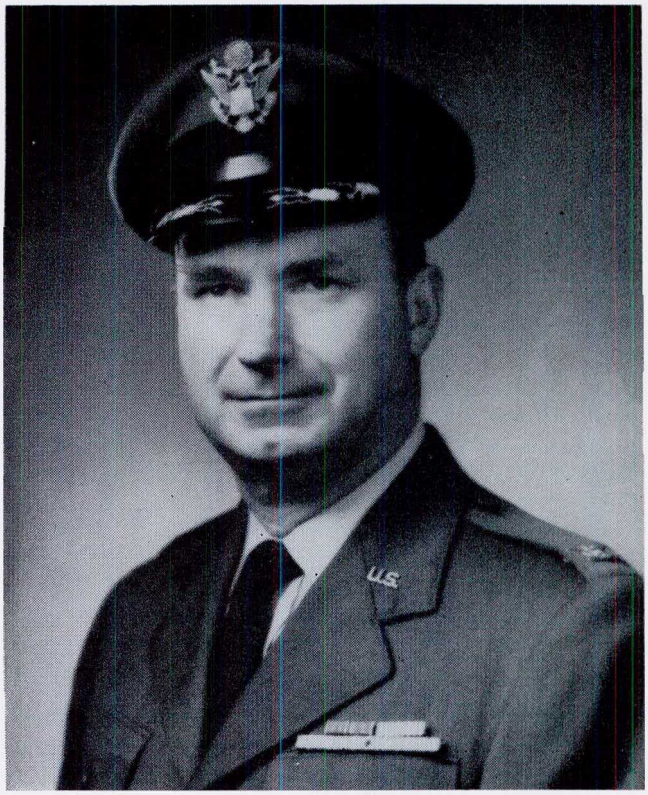
The Rathbone's home address is 10 Glendale Road, Summit, N. J. They are the parents of a daughter, Mrs. W. A. Nichols, and a son, Dr. M. J. Rathbone, both of Baton Rouge.

———o———

Plans for the construction of a tall oil refinery at Springhill for the processing of crude tall oil, have been announced by the Arizona Chemical Co. A jointly owned subsidiary of the American Cyanamid Co. and International Paper Co., the new facility will enable the firm to process annually an additional 40,000 tons of crude tall oil.



One of the south's largest electrical power systems is the North Baton Rouge "Louisiana Station," main generating station for Gulf States Utilities Co.



Brig. Gen. Roy T. Sessums

LES President Sessums Wins Air Force Stars

Roy T. Sessums of New Orleans, assistant vice president of Freeport Sulphur Company and president of the Louisiana Engineering Society, has been promoted to the rank of brigadier general in the U. S. Air Force Reserve.

Gen. Sessums received his bachelor of science degree in civil engineering from Louisiana Polytechnic Institute, Ruston, La., in 1935. He received his master of science degree in engineering from Louisiana State University in 1936 before doing a year of advanced graduate study at the University of Minnesota.

From 1937 to 1940 he was instructor and later assistant professor of engineering at Louisiana Tech and in 1940 was named dean of the School of Engineering.

Duties At Cape Canaveral

In 1942 he was granted a leave of absence and was commissioned a first lieutenant in the Army Air Forces. He was assigned to the Training Aids Division and later to the office of the assistant chief of staff for training at the Pentagon. He served in Europe with the U. S. Strategic Bombing Survey, which unit he later commanded. He is presently assigned to the Air Research Development Command, Air Force Missile Test Center, at Cape Canaveral, Fla.

He continued as dean of engineering at Louisiana Tech until 1952, resigning to become director of the Louisiana State Department of Public Works. He resigned that post in 1955 to join Freeport Sulphur Company as assistant to vice president and coordinator of engineering. He was elected assistant vice president in 1958.

Goes To Korea

From 1948 to 1952 Gen. Sessums was employed on a part-time basis as consultant and operations analyst to the Operations Research Office, Department of the Army, and in 1950-51 went to Korea for several months as operations analyst for classified research projects.

He is a director and a member of the executive committee of the Mississippi Valley Association; a director of the Intracoastal Canal Association of Louisiana and Texas; regional vice president of the Air Force Association; president of the Louisiana Engineering Society; and past president of the Louisiana Section of the American Society of Civil Engineers, the Louisiana Post of the Society of American Military Engineers and the Louisiana Department of the Reserve Officers Association. He is listed in "Who's Who in America," "Who's Who in Engineering," and "Leaders of Education."

—o—

A 24-acre site on the New Orleans Industrial Canal has been acquired by Owens Illinois Glass Co. for construction of a $3 million glass bottle and jar manufacturing plant. Approximately 300 workers will be employed initially.

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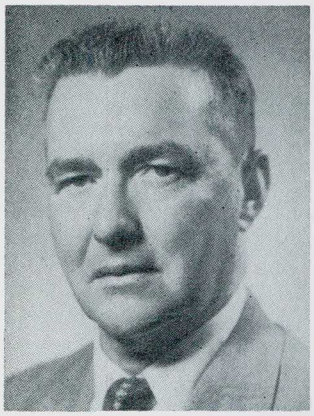
Art & Science

Protecting, Preserving People

By Andrew Lockhart

The success of any enterprise depends entirely on the amount of constructive energy, enthusiam, and endeavor that is put into the enterprise. This axiom or principle



is especially true in the case of a non-profit organization that exists solely for the improvement of our attitudes and conditions in our working and non-working environment. A shining example of a "Going Concern" in a non-profit field is the New Orleans Chapter of the American Society of Safety Engineers (A S S E). This group received its charter in 1949 as a result of the indefatigable efforts of Mr. Arthur Naquin, Safety Counselor for the New Orleans Public Service Inc. and a few other stalwarts of safety. Mr. Naquin served as the society's first Chairman from 1949 to 1951. Previous to that time, there was in existence in New Orleans, the Delta Safety Society comprised of men with safety experience interested in accident prevention. The awarding of the charter established a new policy whereby only individuals with specific qualifications in the field of accident prevention could be accepted for membership in the American Society of Safety Engineers.

The national society of ASSE, organized in Chicago in 1915, developed rapidly in other parts of the country by the organization of local chapters which promoted safety a the local level. In New Orleans, the local chapter is a member of the Louisiana Engineering Society. This affiliation has enhanced its prestige in the community and enabled the society members to make the necessary contacts with the other leading engineering groups in the promotion of accident prevention.

From a handful of members of the Delta Safety Society, this organization—the American Society of Safety Engineers—boasts a present membership of 75. The type of membership varies from Junior Members to Full Members who have over fifteen years' experience in the field of accident prevention.

The 75 members of the chapter cannot be considered a large group when compared with other chapters throughout the United States: the New York Chapter has approximately 600 members, the Los Angeles Chapter 266, the San Francisco Chapter 181. The ones mentioned are the larger chapters and there are about 40 more that have 100 or more members. We make this comparison only to illustrate that the size of an organization is only one factor in determining its eventual success.

Every city in the country has its way of life and its colleges, industries, business groups, civic groups. Consequently, it is up to the individual chapter to make connections with these various groups and, so to speak, "preach the Gospel of safety" and help the community in general in its accident prevention problems.

Our New Orleans Chapter is no exception to the rule. Since this system of national awards has been in progress, which is about six years, the New Orleans Chapter has won the Albert Caddell Award in 1952, 1956 and 1957 as the chapter which achieved the most in the promotion of the arts and science of accident prevention; it won the Southern Regional Award in 1955 and 1958.

This accomplishment was a credit to the organization but when one considers the size of the organization as compared to the chapters in other cities the achievement is almost amazing. Representatives of other chapters have visited meetings and have asked how such a task could be accomplished. The only answer is in the amount of time and effort that the members give to their chosen profession, accident prevention, above and beyond that as given in their daily work.

Within the past year, great strides have been made in the safety education field at the Delgado Trades and Technical School. The chapter was instrumental in developing and organizing safety training for all apprentices and students attending that institution. In other words, accident prevention should be taught to the young before they enter industry. They will enter industry with the full knowledge of the advantages of safe practices. As a result, the whole concept of safety in the industries may change. A different philosophy may develop because the new and the young workers may realize that men are not paid to take chances but to a day's work without taking chances.

At the Delgado Trades School, a Center of Safety Education has been established, and a Safety Library developed. The overall objective of this particular project is to provide safety education in all fields of endeavor. In the near future, it is hoped to set up classes in traffic safety, supervisory training, and other phases of safety education. Of course, none of this would have been possible without the cooperation of the officials of the Delgado Trades and Technical School. The present Director, Mr. Marvin Thames, and his assistants including Mr. Fred Ackis, the Safety Director, have been unstinting in their cooperation as providing safety education to the students.

At Loyola University a complete course in Industrial Accident Prevention is offered for safety directors and industrial relations personnel at a college level. This course consists of a 30 one-hour lectures on Industrial Accident Prevention in addition to interviews with management representatives of various industries on the

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Mr. Andrew Lockhart, an LES member and a registered professional engineer, is public relations chairman of the New Orleans Chapter, American Society of Safety Engineers. He wrote this article for The Engineer.

subject of safety. The course, now accredited under the Management Section of the University, was originally organized by and is conducted by members of the New Orleans Chapter of the American Society of Safety Engineers, the Delta Safety Society and Loyola University.

The Engineering Committee headed by Arthur J. Naquin conducts an Industrial Safety Contest in New Orleans together with the Delta Safety Society and the Metropolitan New Orleans Safety Council. At the present time, there are 98 firms or divisions of firms in the New Orleans area participating in the industrial injury reporting project. This contest started in July 1950 and, since that time, improvement in the accident record of all the participating firms has been unusual. In 1950, the average injury frequency rate* for all participating firms was 21.3. This figure has gradually decreased. The last twelve months showed a cumulative injury frequency rate of 10.2. This activity alone has resulted in a great reduction in injuries to our local labor force and also the misery and suffering that goes with them. Of the 98 contestant groups, over 50 will qualify for the Metropolitan New Orleans Safety Council "Certificate of Safety Achievement." Another group qualified for special awards and plaques donated by the industrial firms and of course the Metropolitan New Orleans Safety Council, the American Society of Safety Engineers and the Delta Safety Society.

In December of each year, in conjunction with the Louisiana Safety Society, the New Orleans Chapter co-sponsors the Louisiana Safety Conference which is held at the Roosevelt Hotel. Prominent speakers from all over the country are brought to this conference which is divided into sections—Industrial, Marine, Farm, School, and Offshore Petroleum. Members of the local chapter participate in practically every phase of this conference.

Another very active committee is the Committee for Cooperation with Small Business. This committee divides its functions into three categories: 1) Public Speaking, in which members address small groups in the New Orleans area on topics in fields of safety information such as safety hazards in retail stores, service stations, and other small business; 2) Free Consultation with Small Business Representatives; and, 3) Dissemination of Information for Small Business. A good example of what might be termed as "pass out" literature is a booklet entitled "The New Orleans Traffic Code." This particular book was developed in cooperation with the American Society of Safety Engineers; the John Dibert Post 351, Veterans of Foreign Wars; the Delta Safety Society, and the Metropolitan New Orleans Safety Council. Over 20,000 copies of the New Orleans Edition of the Traffic Code and Safety Manual were distributed by this committee in conjunction with the other co-sponsors.

Our Traffic Safety Committee also operates in other mediums of education such as radio and TV. During the past year approximately 56 talks on traffic safety were prepared and transmitted over WTIX. These talks were made by various members of the New Orleans Chapter of ASSE and the Delta Safety Society.

A recent 25-page report to the National Headquarters outlined the New Orleans Chapter's activities for the past year. Listed here are just a few of the society's more important accomplishments and contributions to the cause of safety. Of course the work involved in realizing the various objectives of the society takes many meetings. But the most important meetings are the Executive Meetings held as a dinner-meeting usually on the last Friday of each month and the General Meetings conducted on the first Wednesday evening of each month. All meetings are hold in the Engineers' Club in the DeSoto Hotel in New Orleans.

Mr. Stanley Asbury, Safety Director for the Gulf Oil Company, present Chairman of the American Society of Safety Engineers, summed up the objectives of the chapter in his recent inaugural speech in saying, "Our duty as Safety Engineers is to promote the art and science of accident prevention to preserve and protect our most promising and priceless commodity, people. In other words, we are our brothers' keepers."

*Number of Lost-Time Accidents X 1,000,000 = Frequency Rate
Manhours Worked

—o—

Oil Report

(Continued from Page 9)

along the Texas Gulf Coast. It is in competition on the East Coast. And it denies us a market in the Midwest, where Texas oil is the predominant source of crude brought from other states.

Texas has pipeline outlets in the Midwest where Louisiana has none; the cost of transporting Texas-produced crude oil to the East Coast is not appreciably greater than for Louisiana crude shipped by barge or tanker.

Important new producing areas are opening up all over the nation. The Rocky Mountains are a prolific, and growing, source of oil. Alaska is enjoying a spirited oil play. Canada is in the picture.

Operating conditions in these areas may again siphon off investment capital, as they have in years past.

This is not a measurable item. How can you evaluate something which did not take place, and of which you usually know nothing, for the very reason that it never happened?

There is another item, with a profound effect on the oil and gas industry, impossible to measure. That is attitude—both in Louisiana, and in other parts of the nation.

The recent battle to increase natural gas taxes in Louisiana is fresh in my mind. And indelibly engraved there—and, I am sure, in the minds of many other people in industry—is a recurring theme, advanced as the prime reason why natural gas should be saddled with an unreasonable and punitive tax:

"We should keep in mind that natural resources, God-given, should be used as revenues for our children and youth."

And: "What we've got to show the people is that the gas belongs to the people."

And: "Maybe the answer would be to stop the export of gas."

None of these arguments was new. All had been used 15 years ago, when a deliberate effort was made to cripple Louisiana's oil and gas industry by imposing tax burdens and under restrictions on natural gas for the benefit of a competing fuel. The same tactics, and the same arguments, were used from 1956 through 1958, when the tax was imposed.

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E J C

(Continued from Page 10)

Highlights: Industry spent $7.2 billion on R&D in 1957 of which $3.7 billion were financed by the Federal Government.

Basic research accounted for only 3% of the total ($241 million) distributed among: Physical & Mathematical Sciences (54%), Life Sciences (10%), Engineering (36%).

Research funds have increased from $3.5 billion in 1953 to $7.2 billion in 1957. In the period between 1956 and 1957 the increase was 19%. Largest expenditures: Aircraft ($2.1 billion); Electrical Equipment ($941 million); Motor Vehicle ($666 million); Machinery ($562 million); Chemicals ($338 million).

NSF's Program

The President's request for $160,300,000 for the National Science Foundation's 1960 budget will apparently be cut by close to $8 million, following House-Senate conferences. Unfortunately, most of the cut ($6,600,000) will be in the area of support for Basic Research—close to 10% of the NSF's request.

This comes at a time when the Engineering-Sciences Section is making notable progress. In 1958 only 25% of the proposals received were supported, while in 1959, 42% were approved for a total of 129 involving $4,311,900.

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Baton Rouge Prospects Are Bright

Prospects for the future of Baton Rouge continue as one of the brightest in the South. Growth of population in the past 10 years has continued at an ever-increasing rate.

Nine new public schools will be opened in the school year 1959-1960. Another nine older schools are to be remodeled to provide the most modern facilities for all of the 52,000 school children in the city. More than 150 new teachers must be employed to take care of new students and to relieve the overcrowded school rooms.

Solving Traffic Problems

Solution of the traffic problem is also foremost in plans. This year will bring initial construction of the Interstate Highway through the city. This highway, which will incorporate the new Baton Rouge Expressway into its system, will pour $136 million into the Baton Rouge economy during the 10 years required for its completion.

In addition, Florida Street, which is the major east-west artery leading from the business district to shopping and residential sections, has been widened. The other streets carrying heavy traffic are being widened into four-lane thru-ways and connecting into other systems which permit fast and easy movement of traffic.

The aviation committee of the Chamber of Commerce will crystalize its plans this year for a north-south runway at the airport sufficient to handle commercial jet flights into the city.

New Plants Operating

During the past year, Dow Chemical Co. opened its $65 million plant; Wyandotte Chemical opened its $35 million facility, and a few months ago Ormet Corp. dedicated its $55 million installation. Crown Zellerbach Corp. will go into operation to the north of Baton Rouge in the near future, and Gulf States Utilities is building a $20 million power plant south of the city which will be completed and ready to serve additional industries by early next year. A few months ago Union Tank Car Co. opened its great Union Dome north of the city.

The president of Ormet Corp. said during the dedication of his company plant in January that he expected an industrial complex in the area of his plant to total $300 to $400 million in a few years' time.

Port Grows Greatly

The Greater Baton Rouge Port, which opened four years ago, has been growing greatly. In 1957, there were 57 ships to call at the general cargo dock alone and this amount was increased to 105 vessels during 1958. These statistics do not include vessels stopping at the grain elevators of the industrial docks, such as owned by Esso and Kaiser.

In the beginning the Port handled specific commodities, but in 1958, 35 different commodities moved through its facilities. Tonnage anticipated during 1959 is expected to move the Port into the nation's top 10.

The Intracoastal Cut-Off Canal, now under construction, will save 165 miles between here and the Gulf of Mexico. This will mean a great savings in time and money for ships going into and coming from Houston and points west.

Barge Channel Soon

Also under construction is a two and one-half mile Baton Rouge Barge Channel, located north of the Mississippi River Bridge, which will soon be completed and ready to accommodate new industries by offering them industrial plant sites with water at their doorsteps.

Construction of housing is also keeping pace with this growth. Total residential and commercial building permits in the parish last year were $60 million, which is well over six times the amount of construction activity just nine years ago in 1950. That same year 747 single-family dwelling units were built and in 1958 this figure had jumped to over 2,600.

New subdivisions continue to be placed on the market and during this coming year it is anticipated that this year's total of new residential lots developed will exceed the 2,046 total of last year. Several large neighborhood shopping centers are under construction, to add to the $7 million invested in shopping centers last year to take care of neighborhood shopping by this expanding city.

Why This Sudden Growth?

What is the reason for this rather sudden growth for Baton Rouge?

Baton Rouge has become a petro-chemical center by offering more advantages to interested industry than competing cities.

Those points generally considered by industry planning a new location concern availability and price of land near a refinery, additional acreage for expansion, accessibility to markets through all manner of transportation, taxes, amount and quality of water, cost of electric power and natural gas, attitude of State government towards business, the quality and supply of workers, and the nature of the community with regard to housing, schools, churches, etc.

Baton Rouge Ranks High

In all these points, Baton Rouge ranks high, as proven by its success in attracting new plants which were diligently sought after by other cities.

In water alone, 309 billion gallons flows past the City of Baton Rouge daily in the Mississippi River and yet the over-all American industrial process in the entire United States requires only 275 billion gallons of water a day.

Land has been available to industries at reasonable prices and there is a favorable tax climate under which industry operates. Baton Rouge labor is among the highest paid in the United States and yet these have been achieved quietly and harmoniously with management.

Avoids Boom Town Faults

Baton Rouge has been something of a "boom town" during the past few years in its transition from a small city to one of national importance and stature.

Yet most disagreeable features of "boom towns," such as trailer camps, have been avoided. City-parish government, the Chamber of Commerce, the school board, and other responsible bodies have planned well and carefully.



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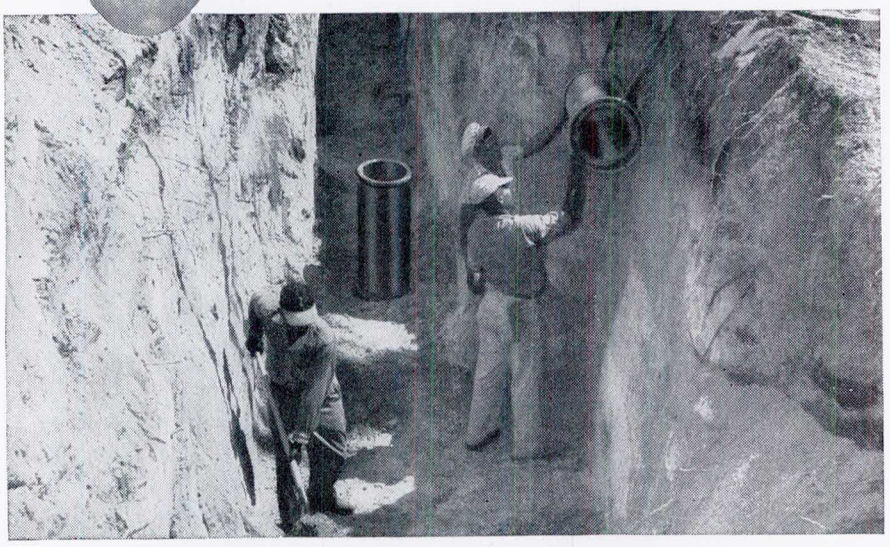

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An Electronic Revolution

Amazing Sealed Circuit Takes Over

Unseen by televiewers, an electronic revolution has been taking place just a few inches behind their TV receiver screens. It involves the shift from complex "rat's nest" wiring to devices known as "sealed circuits," plastic boards on which the electric circuits are firmly etched or stamped.

Sealed vircuits have many other roles fully as important as supplying the current to put Dinah Shore on your television screen. They help to launch missiles, transmit electricity to huge electronic "brains" and make good pocket radios practical. Yet the sealed circuit is so simple it has no moving parts. And it has arrived so recently that few are aware of its contributions to electronic progress.

What is a sealed circuit? In effect, it's simply a sheet of plastic to which a precise wiring pattern of copper foil is attached. The strip of copper foil covers solder-filled holes in the pastic sheet, so that the copper touches the solder. On the other side of the plastic sheet, tubes are arranged so that their "roots" touch the solder-filled holes.

When electricity is fed into one end of the copper foil strip, it zips along, powering one tube after another, and then the electricity left over comes out of the other end of the copper foil strip, goes into a regular wire and back into the wall.

To prevent the copper foil from slipping around or being damaged, the whole board is coated with wax, then given a coat of solder on top of the wax. Thus, the wiring pattern and its connections to the components (tubes in the case of a TV set) are actually sealed in solder.

So — what makes these circuits so valuable for TV sets and missiles? A saving of space, for one thing. Instead of the huge tangle of wiring that early TV sets had inside, most brands today feature sealed circuits — and smaller size. Eliminating the "spaghetti" cuts maintenance costs, too; it's easier for the repairman to see what he's looking for.

One of the biggest advantages of the sealed circuit (called "printed circuit" by some engineers) is that it practically eliminates human error; there's no chance of a new factory hand attaching a wire to the wrong prong on set after set. Just as important, they are rugged — they must be for use in missiles.

Nearly 90 per cent of all new television receivers have sealed circuits. The Radio Corporation of America, one of the pioneers in developing sealed circuitry for electronics, has installed more than 20 million sealed circuits in its radio and television manufacturing.

The accomplishments of sealed (printed) circuits are even more impressive than their specific advantages. Would you believe, for example, that little sealed circuits could help to keep a potential aggressor off our necks? They do! Operating as part of the Atlas ballistic missile's automatic launching system, built by RCA, the circuits help cut down sharply on countdown time, making the missile ready for launching almost immediately after receipt of a warning that enemy planes or missiles are attacking us.

The most precise radar tracking system in the world, operating off Cape Canaveral, also makes extensive use of the sturdy sealed circuits. Two-way belt radios for combat troops, airborne fire-control systems and remote-control devices also "go by the boards."



JIG-SAW PUZZLES? — No, this inspector is checking master negatives to be used in printing the sealed circuits that now replace the "rat's nest" of wires in 80 per cent of TV sets to provide better sound and picture reproduction, and save millions in repair costs. Circuits are etched on fine-mesh stainless steel cloth and then printed on compact, one-piece boards that carry electrical impulses to the TV set's tubes and other electronic components.

* * * *

A $612,000 addition to the American Cyanamid Co. chemical plant in Jefferson Parish is underway. Products of the plant are acetylene, acrylonitrile, ammonia, ammonium sulphate, hydrocyanic acid, monomethylstyrene and sulphuric acid.

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A major expansion of the International Paper Company's Bastrop paper and pulp mill has been announced by Arthur Ross, vice-president of International.

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INDEX OF ADVERTISERS

A-1 Employment Service 27
Airtemp Division, Chrysler Corp. 5
American Creosote Works, Inc. 25

The California Company 7
Creole Engineering Company 26
Central Louisiana Electric 21

W. S. Dickey Clay Mfg. Co. 23

Equitable Equipment Co., Inc. 17
Eugene Dietzgen Co. 26

Golden Anderson Valve Specialty Co. 6
Gulf States Utilities Co. 6

Allan J. Harris Co. 26

LeBaron Motor Co. 21
A. M. Lockett & Co., Ltd. 27
La-Mo Refractory Supply Company 11

McLellan Equipment Co. 11
Menge Pump & Machinery Co., Inc. 17

New Orleans Blue Print & Supply Co., Inc. 25

Pan-American Films 11
Portland Cement Association 2
Professional Listing 12-13

Reagan Equipment Co. 6

Shilstone Testing Laboratory 28
Southern Bell Telephone & Telegraph Co. 25
Standard Supply & Hardware Co., Inc. 27
Steel Service, Inc. 3

Underwater Services, Inc. 3

Williams-McWilliams Industries, Inc. 28

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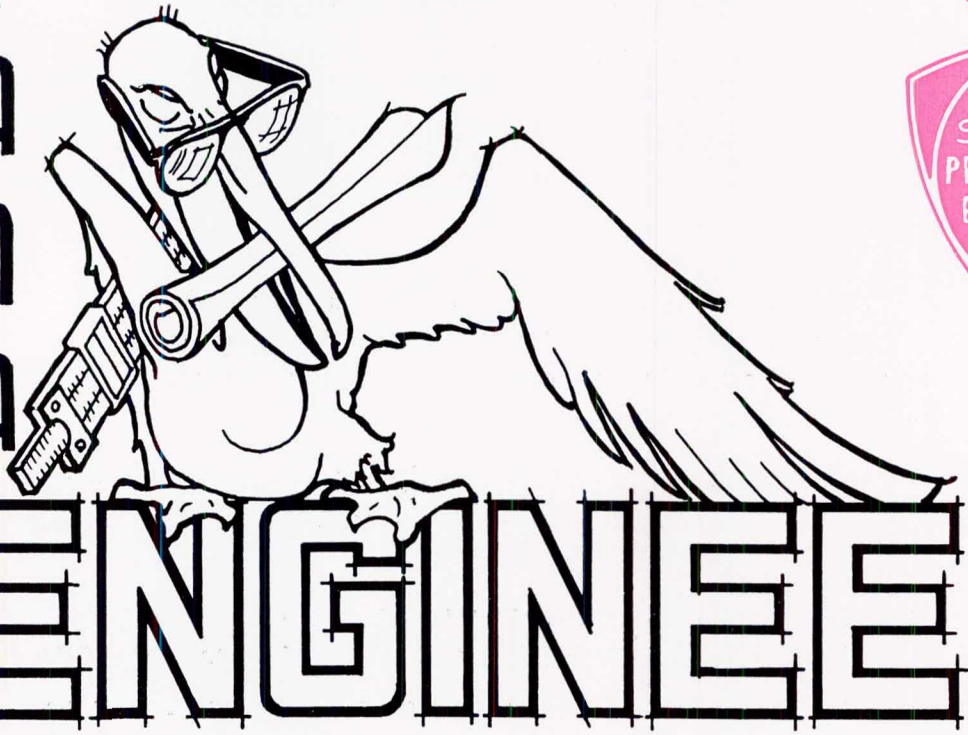

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THE LOUISIANA ENGINEER

Vol. 45 December, 1959 No. 6

CONTENTS

	Page
LES OFFICERS, STANDING COMMITTEES	4
LES MINUTES	5
CONCURRENT RESOLUTIONS STUDIED	7
LA. AVIATION HITS NEW HEIGHTS	8
FIELD NOTES: NSPE, EJC NEWS	10
PROFESSIONAL ENGINEERS GRANTED REGISTRATION	11
PROFESSIONAL LISTINGS	12-13
N. S. SAVANNAH: ENGINEERING AFLOAT	14
LES ANNUAL OUTING: A PICTORIAL REPORT	15
TECHNICAL 'UNITED NATIONS'	16
PIPING IN PROSPERITY	18
A LOOK AT LA.'S FINANCIAL STATUS	20
MEMORIALS	24

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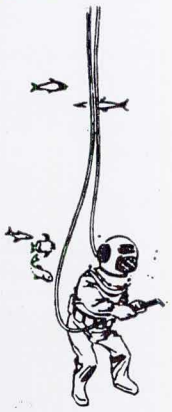

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OUR COVER: James M. Todd (right) is this year's recipient of the LES President's Trophy. The award was presented to him by LES President Roy T. Sessums at the Society's Annual Outing banquet at the Metairie Country Club. Mr. Todd won the President's Flight in the annual golf tournament (see photos, Page 15).

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Shell Oil Plans New Norco Asphalt Facilities

Construction of new asphalt facilities will be completed at Shell Oil Company's Norco Refinery by next spring. The new equipment is designed to allow Norco to produce and stock increased quantities of asphalt from basic materials already available.

Primary aim of the expansion program, however, is to provide the refinery with a method of loading seagoing tank ships for the haul to the Eastern part of the U. S. where there is an increasing demand for the product.

At present the entire Norco asphalt output is sold to local markets and is transported by railroad tank cars and tank trucks.

The new equipment will be:

An asphalt blender for mixing two asphalt components.

A 20,000-barrel storage tank for one of the components and two 35,000-barrel tanks for storage of the end product.

A steam generator for cooling the product for storage.

A special insulated pipe line leading from the blender to the storage tanks and from there to the Norco wharf. This line is designed to maintain the asphalt at a high temperature so that it may be transported.

A pump for loading the asphalt on the ships at Norco's wharf on the Mississippi River.

La. Engineering Society

Minutes of Meeting of the Board of Direction held on Friday, September 14, 1959, at the Engineers' Club, New Orleans

The meeting was called to order by President Sessums with Messrs. Durning, Janssen, Jenkins, McLellan and Fernandez present. Messrs. Donald Derickson and Frank Macdonald of the State Board of Registration, Allen Johnson, Public Relations Counsel, and F. L. Larue of the Lafayette Section also were present by invitation. Dean Bogard advised by long distance telephone from Monroe that his plane flight had been cancelled and therefore he was unable to be present.

The order of business was dispensed with so that Messrs. Derickson and Macdonald could present the State Board's comments on concurrent resolutions Nos. 1 and 4 passed at the recent fiscal session of the State Legislature. The resolutions which pertain to the registration of public employees were read and, after considerable discussion, Mr. Durning introduced the following resolution and moved for its adoption:

> WHEREAS, the Louisiana Legislature at its 1959 Fiscal Session passed Concurrent Resolutions No. 1 and No. 4 which purported to the registration of unqualified public employees under the Engineering Registration Act (Act 73 of 1950), and
>
> WHEREAS, the said resolutions included a statement indicating that the Louisiana State Board of Registration for Professional Engineers and Land Surveyors was in agreement with them, while in fact the state board was not consulted and does not concur in or approve of these resolutions, and
>
> WHEREAS, one hundred and twenty-nine applicants have requested registration as Engineers on the strength of these resolutions, and
>
> WHEREAS, these resolutions and similar resolutions have the effect of circumventing Act 73 of 1950, and
>
> WHEREAS, the registration of these unqualified applicants would endanger public life and property, now therefore
>
> BE IT RESOLVED, that the Louisiana Engineering Society commend and approve the action of the Louisiana State Board of Registration for Professional Engineers and Land Surveyors in rejecting applicants for registration under the above mentioned concurrent resolutions, and
>
> BE IT FURTHER RESOLVED, that the Louisiana Engineering Society take steps to acquaint all State Legislators, Civil Service and other agencies of this action, and to endeavor by all available means to prevent the passage of similar resolutions in the future, as being contrary to the best interests of the State and of the public.

The above was seconded by Mr. McLellan and carried unanimously.

Mr. McLellan moved that minutes of the August meeting be accepted as read, seconded by Mr. Janssen and carried.

A preliminary report of the special committee appointed to consider the location of future anual meetings was read, in which it was recommended that the 1961 meeting be held in Baton Rouge and the following procedure was suggested for future meetings:

1. Any section desiring the Annual Meeting should present a prospectus at least three years in advance, detailing the convention facilities, the local committee to handle the meeting and presenting any special reasons for wanting the meeting which would provide an attraction to the membership (i.e. Centennials, Civic Celebrations, etc.)
2. The Annual Meeting should be held in New Orleans at least every second year.
3. The Board of Direction should consider carefully each request for the Annual Meeting, evaluating the stimulus to be given the host section and the remote membership.
4. The state sections are cautioned against ill-advised and hasty requests for the Annual Meeting, recognizing the necessity for adequate facilities, a good committee to run the meeting and the perils to both the Section and the Society associated with a poorly attended or run meeting.

Mr. McLellan moved that the 1961 Annual Meeting be held in Baton Rouge and that the secretary inform the section that its invitation had been accepted. Motion seconded by Mr. Janssen and carried.

Mr. Janssen moved that Messrs. James H. Jenkins, Jr. and Alan Blackwood be transferred to Affiliate Member grade, seconded by Mr. Durning and carried.

An acknowledgment of floral offering from the Michael H. Reilly family was read and the president appointed Mr. David Moodie to head a committee of his own choice to prepare a memorial resolution in honor of the deceased.

President Sessums then appointed a Nominating Committee consisting of the three most recent past presidents, with the immediate past president to serve as Chairman, to select a slate of candidates for the society's annual election of officers.

The secretary announced that the selection of recipients for the Certificate of Appreciation and for Honorary Membership should be made at the board's next meeting and urged members to consider possible candidates.

It was announced that the date of the Annual Outing had been postponed until October 27.

Mr. Allen Johnson gave an outline of the activities and plans made by his firm as Public Relations Counsellors for the society. Mr. Jannsen moved that Allen Johnson & Associates be represented at all meetings of the Board and the society and the secretary be instructed to place their name on mailing list. Motion seconded by Mr. Durning and carried.

A letter addressed to President Sessums by the Louisiana State Bar Association recommending a joint seminar for engineers and lawyers was read, after which Mr. McLellan moved that the LES participate in this program. Motion seconded by Mr. Janssen and carried.

The secretary was requested to submit a list of possible committee members for appointment to N.S.P.E. Functional Sections.

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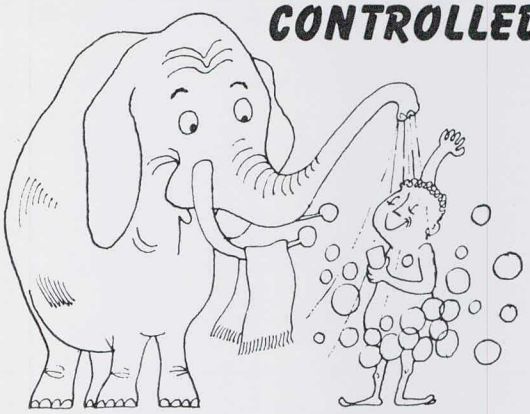

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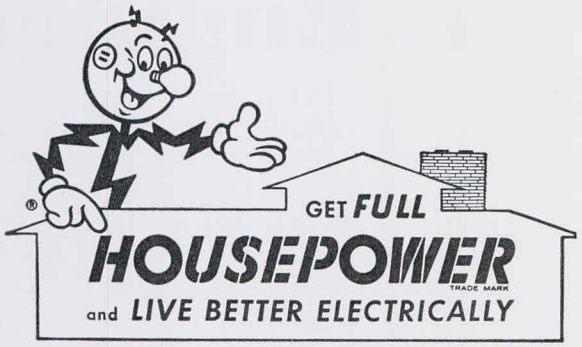

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LES Supports State Board Position

Concurrent Resolutions Considered

The Louisiana State Board of Registration for Professional Engineers and Land Surveyors has carefully considered the effects of two Legislative Concurrent Resolutions pertaining to the registration of "unqualified" public employees.

The State Board, according to Donald Derickson, Board Chairman, feels that the result of these resolutions would be "inimical to the public safety."

Supporting the State Board's position, the Louisiana Engineering Society Board of Direction noted that the State Board was not consulted by, and was not in agreement with the sponsors of the Concurrent Resolutions, Nos. 1 and 4.

The concurrent resolutions would permit the application of a number of employees of the State for certification as public employees under the State's basic engineering statute (Act No. 73 of 1950).

Said Dr. Derickson: "It has been suggested that these applicants, who in many cases are veteran state employees, find themselves unable to advance further in the way of promotion and increased compensation because the Civil Service system has no higher classification of subprofessional rank.

"These veteran employees are naturally seeking relief from this predicament. However, these resolutions have the effect of downgrading professional requirements under the engineering statute rather than providing for new classifications under the Civil Service system, which appears to be the proper remedy if the facts justify action."

Dr. Derickson added: "This appears to be unsound in terms of the public safety, and weakens the effectiveness of the law governing the registration of some 6,000 Louisiana professional engineers."

The Legislature's concurrent resolutions, passed during the last session, provided that certain State employees should be licensed as Civil Engineers—in view of the inability of the State Civil Service Commission to advance them to higher status. Following passage of these resolutions, some 129 applied for status recognition as public employees under the basic engineering act.

The Legislature's joint resolutions have the effect of circumventing Act 73 of 1950, said the Louisiana Engineering Society Board of Direction, "and therefore the Society commends and approves the action of the State Board in rejecting applicants for registration under these concurrent resolutions."

Roy T. Sessums, President of the Louisiana Engineering Society, pointed out that the National Society of Professional Engineers has recently undertaken a survey of state civil service and merit systems regulations relating to engineering personnel policies.

"Such a survey," said Sessums, "will serve to focus attention on all areas of state engineering personnel administration so that improved policies and higher standards wil result."

(Editor's Note: Concurrent resolutions cannot amend or change the law. They can serve as statements of intent or policy, or in some cases suspend portions of a statute).

Text of the Louisiana Engineering Society Board of Direction's Resolution on the subject follows:

WHEREAS, the Louisiana Legislature at its 1959 Fiscal Session passed Concurrent Resolutions No. 1 and No. 4 which purported to the registration of unqualified public employees under the Engineering Registraction Act (Act 73 of 1950), and

WHEREAS, the said resolutions included a statement indicating that the Louisiana State Board of Registration for Professional Engineers and Land Surveyors was in agreement with them, while in fact the state board was not consulted and does not concur in or approve of these resolutions, and

WHEREAS, one hundred and twenty-nine applicants have requested registration as Engineers on the strength of these resolutions, and

WHEREAS, these resolutions and similar resolutions have the effect of circumventing Act 73 of 1950, and

WHEREAS, the registration of these unqualified applicants would endanger public life and property, now therefore

BE IT RESOLVED, that the Louisiana Engineering Society commend and approve the action of the Louisiana State Board of Registration for Professional Engineers and Land Surveyors in rejecting applicants for registration under the above mentioned concurrent resolutions, and

BE IT FURTHER RESOLVED, that the Louisiana Engineering Society take steps to acquaint all State Legislators, Civil Service and other agencies of this action, and to endeavor by all available means to prevent the passage of similar resolutions in the future, as being contrary to the best interests of the State and of the public.

Announces New Lake Charles Plant

The Hercules Powder Company of Wilmington, Del., has announced it will build a multimillion-dollar polypropylene plant at Lake Charles.

Construction of the new facility is to begin immediately. Completion of the first 50-million pound unit is scheduled for early 1961. Plans call for a plant which ultimately will have a capacity for producing more than 100-million pounds a year.

Polyprophylene is a plastic resin product used in the manufacture of film, auto seat covers, outdoor furniture webbing and several injection-molded plastic items.

Elmer F. Inner, general manager of Hercules cellulose products, said the plant will be the second such facility constructed in the country. A smaller plant has been operated by Hercules since 1957 in Parlin, N. J.

Moisant Gets New Terminal

La. Aviation Soars To New Heights

Commercial aviation facilities in New Orleans, like the air age itself, have progressed from the early pioneering stage to a modern marvel of man's achievement.

Before the airfield at Moisant was begun at Kenner in 1941, air facilities here had followed a typical pattern alongside the development of aviation, beginning with a dairy field. There had been another field about midway of what is now Canal Boulevard, then a pasture at Belle Chasse which is now Alvin Callender Rield; Menefee Airport at Chalmette, Wedell-Williams Field between Shrewsbury and Harahan—and finally what is now known as the New Orleans Airport, and which adequately served commercial air travel for a time.

By 1941, however, aviation-minded New Orleanians, supported by their Association of Commerce, were looking to an acceleration of air travel on a world-wide scale and to the corresponding need for expanded airport facilities to assure New Orleans a prominent position in the Air Age.

At their urging, the City of New Orleans established an Aviation Division, with an eye to funds appropriated by Congress that year, with authorization given the Civil Aeronautics Administration to assist in the development of airports where the national defense could be served.

Douglas O. Langstaff was appointed Director of Aviation and the search for a larger airport site was begun.

Flying over an area near Kenner one day, Mr. Langstaff spotted numerous patches of cleared and cultivated ground, indicating a less marshy terrain that others surrounding New Orleans.

Following consultations and surveys by the Aviation Division, the CAA and the U. S. Corps of Engineers, the site at Kenner was chosen as the most desirable, due to its proximity to business and residential districts and its soil conditions suitable for runways.

Some 733 acres were purchased the same year with funds provided from the City's general fund, and by September work was underway on what was then called Kenner Airport.

New Orleans Mayor Robert S. Maestri recalled then that the spectacular aviator, John Bevins Moisant, had been killed in a crash not far from the airport site some 30 years earlier.

Thus Moisant International Airport takes its name from a pioneer airman, born in Kankakee, Illinois, of French-Canadian parents, who distinguished himself by many daring feats in the air, and by many aviation firsts: he was the first to fly a passenger over a city; first to fly from Paris to London with a passenger; first to fly that route by compass.

There has been considerable talk over the years of renaming it "New Orleans International Airport"—which is again being revived with the opening of the new terminal.

In October, 1941, the CAA allocated $710,000 for Moisant and followed up a year later with an additional $601,000.

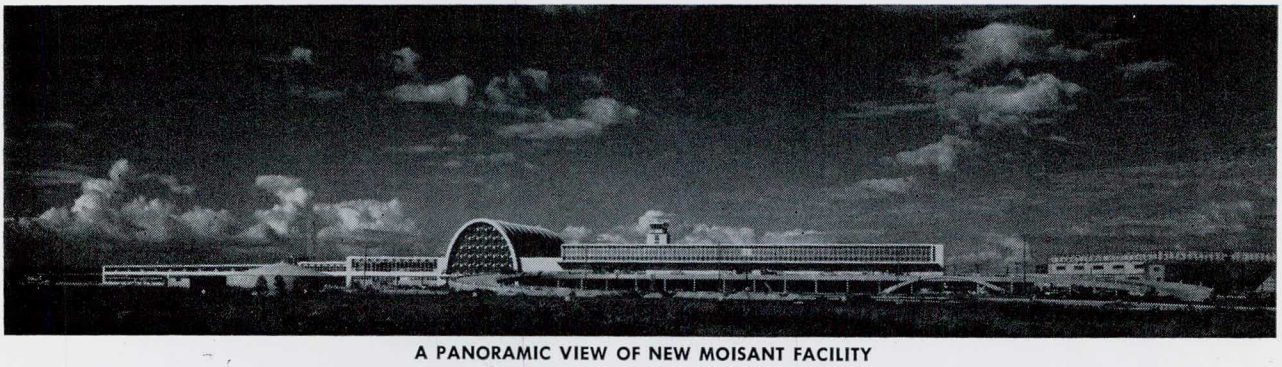
Ground breaking ceremonies were held November 16, 1941, and preliminary development, along with construction of two 5,000-foot concrete runways, was well underway when the bombing of Pearl Harbor brought work to a temporary halt.

The City of New Orleans offered Moisant to the armed services. The Navy accepted and as a result, the CAA continued the development of the airport.

The completed field, with three 5,200-foot runways and one of 7,000 feet with 50-foot taxiways and a 1200 by 450-foot concrete apron, represented an outlay of $3 million by the Federal Government. This included certain ground equipment necessary for wartime operation, but provision for such government funds prohibited their use for building, hangers or similar facilities.

The necessity for the City to secure funds for an administration building and other construction necessary to the airport was apparent. In October, 1943, the voters approved a bond issue for $5 million to cover work at Moisant. It was the first time voting machines had been used in New Orleans for a bond issue.

A month earlier, Mayor Maestri had announced the formation of an Aviation Board for the City of New Orleans, with complete supervision over these funds. Five non-political, civic leaders were appointed to serve: A. B. Paterson, President; Ernest A. Carrere, Vice-President; George E. Schneider, Secretary; Raymond H. Saal, Assistant Secretary, and John Legier, member, "Run Moisant



A PANORAMIC VIEW OF NEW MOISANT FACILITY
. . . "a prominent position in the Air Age"

Airport as if it were your private business," the Mayor told them—a philosophy followed by these and succeeding board members to the present. Mr. Langstaff was named Executive Director of the Board.

Half of the authorized bonds were sold, at 6% interest, and the remaining $2.5 million retained for airport expansion when materials would become available.

The Board managed to secure War Production Board approval for materials to construct a hangar, portions of which would be used temporarily for administration needs. Thus Moisant's was the only airport administration building constructed during World War II.

More land was needed and proceedings were started in 1944 to acquire 376 acres. These were so complex, involving the U. S. Army, the Federal Second Wartime Powers Act, its expiration, and assumption of its authority by the General Services Administration, that it was October of 1951 before the City could take title to the land. This had required an Act of Congress, signed by President Harry Truman. Smaller bits of land had in the meantime been acquired, including a site for a Civil Aeronautics Board radio range station.

The first commercial plane landed at Moisant on September 13, 1944. It was a four-motored Pan American Clipper which had flown from the New Orleans Airport, stopping at Callender Field en route.

Moisant International Airport was formally dedicated on January 12 and 13, 1946 by General James H. Doolittle. Airlines began moving their operations into Moisant in March, continued through April and on May 1, 1946 at 12:01 a. m., the control tower at Moisant went on the air —and the field was officially open for business.

At that time, there were 50 daily flights. A month later, these had increased to 74.

DeLesseps S. Morrison became mayor that year and immediately launched an all-out effort, backed by civic and business leaders, to boost international trade and travel through the City. The slogan, "New Orleans—Air Hub of the Americas", was coined.

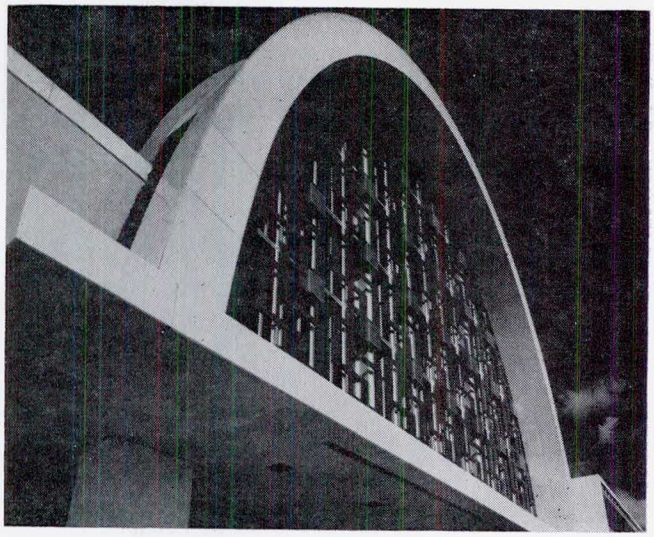
At the end of its first year of operation, Moisant was awarded the H a i r e Trophy, after a poll of airports throughout the nation for 1946 showed it to be unsurpassed in development and achievement. It also had a perfect safety record, with eight major airlines operating more than one hundred flights a day.

Accommodations for international as well as domestic flights were increased in 1947, two new hangars were begun and an instrument landing system completed—one of ten in the entire nation at the time.

On December 1, 1948, Moisant was the largest commercial airport in the country. It had a field area of 1360 acres, and the 30,000-square foot administration building provided ticket counters for eight airlines, a 24-hour snack bar, a restaurant, gift counters, newsstand, barber shop, Western Union and telephone service. Some 2500 passengers were being handled every 24 hours on more than 100 daily flights, including six international ones.

In 1949 and 1950, a $247,000 waterworks and fire protection system was installed and plans were completed for a $200,000 ground control approach system. Only half of the authorized total of the original $5 million bond issue had been sold, and the Aviation Board still has

(See Airport, Page 22)



Closeup of new terminal . . . expanding service

Koon To Discuss Air Traffic Control

Arthur W. Koon, Jr., chief air traffic control specialist for Moisant International Airport, will be the main speaker at the December 14 meeting of the Louisiana Engineering Society at the Engineers Club in New Orleans.

His subject will be: "Air Traffic Control Methods."

M. J. Cade, program committee chairman, said Mr. Koon's talk will outline the problems associated with handling the tremendous flow of air traffic at large airports, and will describe how these problems are presently handled by means of radio, radar, and other electronic aids.

In addition, Mr. Koon will show a film presenting some advanced systems which the Federal Aviation Agency is considering for future use in air traffic control.

A key factor obviously in Koon's work is that of safety, augmented at Moisant by the fact that there is considerably more standby equipment which can be put into operation quickly than could be operated in the old Moisant tower (see other story, this issue).

IFR Room

Koon is responsible for the "IFR" room where all aircraft flying into and out of the New Orleans terminal area on instrument flight rules are accounted for by radar and controlled by radio.

The room houses a long cabinet with three radar consoles and three flight data positions. The flight data positions are panels upon which are mounted cardboard strips representing individual flights and containing the flight's complete history in the controller's special sign language.

Goodwill— Field Notes
By Allen Johnson

ENGINEERING GOODWILL ABROAD—Prof. Walter E. Blessey, head of the Department of Civil Engineering of Tulane University recently completed a lecture tour on Pre-Stressed and Light Weight Concrete through Central and South America, under the sponsorship of UPADI (Pan American Federation of Engineering Societies). EJC's Committee on International Relations worked closely in developing the program and received full cooperation from Dean Lee H. Johnson of Tulane.

The tour included: Argentina, Brazil, Chile, Cuba, El Salvador, Mexico, Panama, Peru Venezuela and Uruguay, from July 29 to September 3. Commenting on the trip, James M. Todd, President of UPADI Fund, Inc. said, "I do believe that this lecture tour by Professor Blessey will result in very much good for both engineering public relations in South and Central America, and some improvement in the understanding and teaching of structural engineering in these areas. I am equally sure also that Professor Blessey learned some new details with reference to pre-stressed concrete, which will be beneficial."

Robert L. Allshouse, superintendent of construction for Stone & Webster Engineering Corp. in Louisiana and Texas, has been named a construction manager of the firm and transferred to the Boston headquarters, E. J. Ford, vice president and senior construction manager, has announced.

Allshouse is well-known in South Louisiana for his work on the Gulf States Utilities Co. power plants in Baton Rouge and Westlake, and in Beaumont, Tex., where he currently resides.

LES Vice-President Edward McLellan represented the Society at the annual meeting of the Baton Rouge Council of Engineering and Scientific Societies at the Capitol House Hotel. M. J. Rathbone, president of Standard Oil Company, (New Jersey), outlined the history of the Esso Standard Oil Co. Baton Rouge plant and described some of the marvels planned for the future through engineering research (see story this issue on a new Esso Research center) . . . McLellan this month attends the annual meeting of the American Chemical Society in New York City.

The New Orleans Section of the American Institute of Chemical Engineers heard interesting talks by B. A. Axelrad, Assistant Vice-President and Senior Technical Advisor, Freeport Sluphur Company ("Sulphur Mining in Louisiana") and Robert M. Henderson, Director-Market Research, Petroleum Chemicals Inc. ("Why Market Research—and How?") at recent meetings, according to E. S. Gaiennie, section secretary.

Frank C. Fromherz is the new president of the Louisiana section, American Society of Civil Engineers.

Other new officers are Francis B. Sessums, first vice-president; Roy G. Cappel, second vice-president; Joseph T. Montgomery, secretary-treasurer, and Donald P. Boudreaux, assistant secretary.

Members elected to the board included Hu B. Myers, A. J. Szabo, J. C. McLemore, David Hunter Jr. and Wayne Sexton.

The National Society of Professional Engineers, moving toward its goal of 60,000 members by 1960, gained its 51st state-level affiliate, Vermont, and its first student chapter—University of Pittsburgh—at its annual fall professional meeting in Pittsburgh, according to President Harold A. Mosher.

President Mosher outlined a four-point program of activity for NSPE during 1960.

He urged increased work by the Society in the areas of (1) membership; (2) public relations; (3) unity; (4) grass-roots approach to the activity of the local, state and national levels of the Society.

* * *

In other action, plans were announced for a board survey of state civil service and merit system regulations relating to engineering personnel policies.

Details of the survey were outlined to the NSPE Board of Directors by Wesley E. Gilbertson, chairman of the Society's Functional Section for Engineers in Government Practice.

"The Functional Section believes such a study to be extremely meritorious in that it will serve to focus the attention on all areas of state engineering personnel administration so that more improved policies and higher standards will result," Gilbertson told the Board.

The survey, he said, will be carried out in cooperation with the functional sections of the state societies. Plans are also underway to extend the survey to include engineering personnel policies in the major municipalities.

Gilbertson also announced plans for the appointment of a special committee to meet in November with Rocco C. Siciliano, special assistant to the President on Personnel, to discuss Federal classification legislation. NSPE is backing legislation which would establish separate classification and pay schedules for engineering and scientific personnel. The Administration has indicated opposition to the proposed bills.

———o———

EJS's Nominating Committee announced the unanimous nomination for EJC offices in 1960 (election at Board of Directors' November meeting):

President—Augustus Kinzel—Vice President, Research Union Carbide Corp.; former AIME president (1958).

Vice President—Cecil Boling—President, Dunham-Bush; former ASHRAE President (1958).

(Continued on Page 19)

Professional Engineers Granted Registration

Oct. 20, 1959—Fred M. Adlam, New Orleans; Keith L. Andrepont, Opelousas; George Asseff, II, Mansfield; Harold W. Austin, Shreveport; Joseph H. Benton, Baton Rouge; Roy D. Boudreaux, Jennings; Robert R. Canfield, Baton Rouge; John R. Copeland, New Orleans; Alfred S. Davis, Jr., Houston, Tex.; Richard F. Dicharry, Baton Rouge; Raymond J. Franz, New Orleans; Luis Gonzalez Llebrez, New Orleans; Peter H. Hatten, Gulfport, Miss.; Robert S. Hauser, Norristown, Pa.; Warren G. Hebert, Abbeville; Jack N. Hodges, Clinton, La.; Ali S. Kemahlioglu, Baton Rouge; Honore J. Lartigue, New Orleans; James M. LoCaste, Lafayette; Bernard Marcantel, Oakdale; Derral M. McDonald, Port Sulphur; George L. McMurtray, Jr., Kenner; Howell L. Pearson, Baton Rouge; E. F. Schuler, III, Keatchie; Robert M. Shivers, Patterson; William D. Strange, Triumph; J. B. Willis, Jr., New Orleans; John W. Woodring, New Orleans.

Nov. 11, 1959—Frank C. Allen, Jr., New Orleans; James Allison, New Orleans; Howard G. Angle, Shreveport; (Bro.) Lloyd A. Barry, S.J., Grand Coteau; Robert W. Cassingham, New Orleans; Onnie B. Cross, Shreveport; James J. Danaher, Jr., Mobile, Ala.; Jacques P. de la Vergne, New Orleans; Clyde W. Dyerson, Jr., Morgan City; Sydney Ellis, Jr., New Orleans; Billy M. Ennis, Golden Meadow; Robert P. Flanagan, Golden Meadow; Miguel M. Flechas, III, Pascagoula, Miss.; Joseph L. Gadberry, Orange, Tex.; Jack L. Hubbard, Dallas, Tex.; Theodore A. Kritikas, New Orleans; William R. Lacefield, Birmingham, Ala.; Frank H. Lewis, Jr., New Orleans; Ronald K. McKneely, Ruston; George F. Miller, Jr., Metairie; Carl Leon O'Neal, Dallas, Tex.; Robert L. Pate, Ruston; Hugh S. Pylant, Shreveport; Kirby D. Schenck, Venice; Ellis H. Sheridan, Jr., Houma; Irwin L. Tunis, Metairie; Seth W. Ward, Clinton, Miss.; Calvin E. Woods, Beaumont, Tex.

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Announce New Award

An Industrial Professional Development Award will be presented annually by NSPE to the industrial organization employing engineering personnel, which has made an outstanding contribution to the advancement and improvement of the engineering profession through its employment practices. The first award will be presented at the Society's annual meeting in June, 1960, in Boston.

The two-fold purpose of the award, details of which are contained in the enclosed announcement, is to "give adequate recognition to the firm which has demonstrated the application of forward-looking engineering employment practices, and to encourage industrial employers of engineering personnel to adopt progressive engineering employment practices."

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What Every Louisiana P. E. Should Know

This is the third of a series of articles prepared by the Editorial Staff of the LOUISIANA ENGINEER in which an attempt will be made to answer questions of interest to professional engineers in this area. Where, in certain instances, it becomes necessary to answer questions of a controversial nature, it must be re-emphasized that the opinions expressed are those of the Editorial Staff and do not necessarily reflect the feelings of the Louisiana Engineering Society nor the Louisiana State Board of Registration for Professional Engineers and Land Surveyors.

For obvious reasons, no attempt will be made to go into legal interpretations since, in such matters, ethics dictate that we respect the boundaries of our sister profession. Any other questions our readers might wish to submit, pertaining to the Engineering Profession, will be welcomed by the Editorial Staff.

QUESTION—Why do some states register professional engineers by branches of engineering while others register them simply as professional engineers?

ANSWER—Actually this is somewhat of a sore subject, in our state, involving differences of opinion within our profession. Our analysis of the problems involved, which, incidentally, might fall into the category of "knocking heads" is as follows:

The Civil Engineering Branch was, in general, the first to promote registration of its members and, as a result, many state laws originally provided for registration of civil engineers only. Later, as it was realized that not just civil engineers but **all** professional engineers should be required to register, there was a definite reluctance on the part of the civil branch to sanction encroachment upon its prior rights. In our opinion, this reluctance was largely founded upon the misapprehension that mass registration of all professional engineers would open the doors to the practice of civil engineering by all professional engineers whether qualified in that branch or not.

As a compromise, many states, in making the transition, provided for registration by branches on the correct assumption that a professional engineer, registered in the Electrical Branch, would not attempt to practice in the Civil Branch and vice versa. However, (and here is where the "head knocking" starts) in our opinion, no such delineation is necessary in the engineering profession any more than it is necessary in the medical or legal professions. Ethics dictate that a professional engineer practice **only in the branches of engineering in which he is qualified.** Certainly, branch registration will not, in itself, deter a shyster who has no regard for the ethics of the profession. Whether registration is blanket or branch, unethical practice is a matter for the State Board of Registration to handle in accordance with the legal powers invested in it by the Registration Act.

While Louisiana, at the present time, requires registration by branch, we can see definite advantage to our profession in following the lead of most of the other states in providing registration as "Professional Engineer" with no designation of branch. Probably the greatest deterrent to the advancement of our profession has been the division, on a national level, by branches and the resultant lack of unified action. While the Engineers' Joint Council and the National Society of Professional Engineers have progressed a long way toward unifying the profession, there is still much work to be done at the local level. Certainly the use of a single designating term, "Professional Engineer," will go a long way toward consolidating their efforts.

Let us hope that we, in Louisiana professional engineering, can resolve our minor differences of opinion in the interest of the profession in general since it is difficut to envision any unwillingness on the part of the State Legislators to grant a request for revision of our Registration Act to place it on a par with those of the majority of the other states.

QUESTION—How many states register professional engineers by branches and how many register only as Professional Engineers?

ANSWER—Twelve states, including Louisiana, register professional engineers by branches while forty states register only as professional engineers.

DID YOU KNOW THAT

In Louisiana and twenty-seven other states, the state engineering society makes nominations or recommendations of engineering registration board members to the governor, who, in turn makes the appointments.

Louisiana and Michigan have seven-year terms for engineering registration board members.

Eight states have six-year terms for engineering registration board members.

Forty-one states have terms ranging from three to five years for engineering registration board members.

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A Triumph of Engineering:

Nuclear Ship Savannah

The atomic-powered merchant vessel N.S. SAVANNAH is a triumph of engineering, perhaps outshining every American commercial vessel, and surely each foreign liner.

Located amidships is the 26½-foot tall nuclear reactor that powers the ship. The 145-ton reactor houses the core of uranium fuel elements and the control rods. In the reactor vessel, heat is produced by the fission of uranium atoms.

The inside of the reactor is completely shielded with stainless steel to protect the 6½-inch thick steel plating against the ravages of 1750 psi radioactive water surrounding the fuel elements.

Stainless tubing tested to many times actual working pressures conducts pressurized fluid from the reactor to the heat exchangers, where steam is produced to drive the ship's power turbines.

Radioactivity will be no danger. Reactor design and use of tough metals make the nuclear ship as safe as a quiet evening at home in your easy chair, and certainly far safer than a vacation trip in the family automobile.

Reactor System

The primary source of power for the N.S. SAVANNAH is a nuclear power reactor located amidships. The reactor designer estimates the merchant vessel could travel as much as 350,000 miles on one fuel loading.

Within the reactor are 32 fuel elements, each containing 164 fuel rods. The interior of each rod is filled with sintered uranium oxide pellets that act as fuel.

Each of the 164 fuel rods are composed of four bundles of 41 rods each. Rod spacing is maintained by small tubular steel ferrules, brazed in place about every eight inches along the 76-inch long element.

Fuel elements fit into an "egg crate" type lattice which provides the equivalent of a pressure can around each element. To withstand the pressure differentials created during reactor operation, the latticework is constructed of steel, ranging in thickness from 0.094 to 0.109-inches thick.

Modulation of the nuclear reaction is achieved by 21 control rods, each shaped somewhat like a cross. Control rods are 0.375-inch thick steel of sandwich design: a 3/16-inch thick plate of boronated steel between two 3/32-inch thick steel plates.

The reactor vessel containing the fuel elements is approximately 27 feet tall by 11 feet in outside diameter, with an inside diameter of about 7½ feet. Vessel walls are 6½ inches thick. The entire interior surface of the vessel is clad with steel, 0.109 inches thick. The metal container is designed to operate at 650 degrees F confining water coolant at 2000 psi.

The bottom head of the reactor vessel is forged from a 58,646-pound circular plate of carbon-silicon steel, 15 feet in diameter. Before forming, the plate surface which became the inside of the forged head. The reactor head is believed to be the largest, thickest and heaviest pressure vessel closure ever forged in one operation by di-forming.

Water coolant for the reactor is circulated by four primary circulating pumps of the canned rotor type. All primary pumping is made from hollow forgings with a design pressure of 2000 psi.

Two steam generators act as heat exchangers to convert superheated, pressurized reactor water to steam for the power turbines. Each generator consists of a U-shell, U-tube boiler about 20 feet long over-all, and contains about 800 steel tubes ¾ inches OD.

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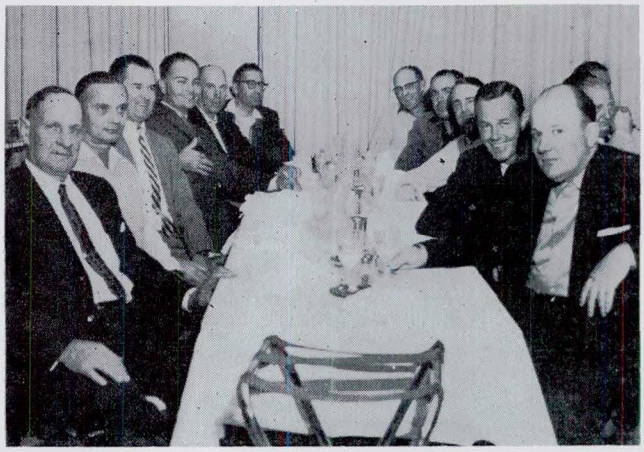
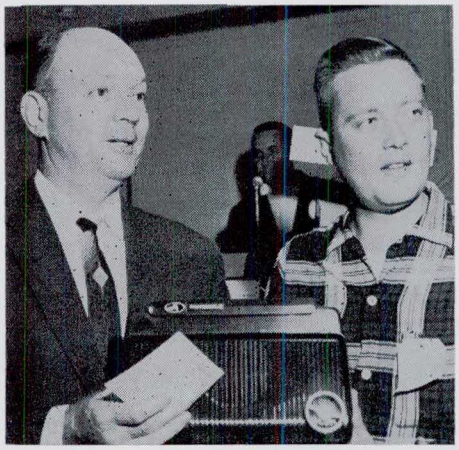
Packed house (above) followed proceedings of Annual Outing banquet in which lighter mood prevailed. Numerous prizes were awarded.



Banquet followed day of golf, horseshoe pitching and other events. A large crowd, including group above, attended.



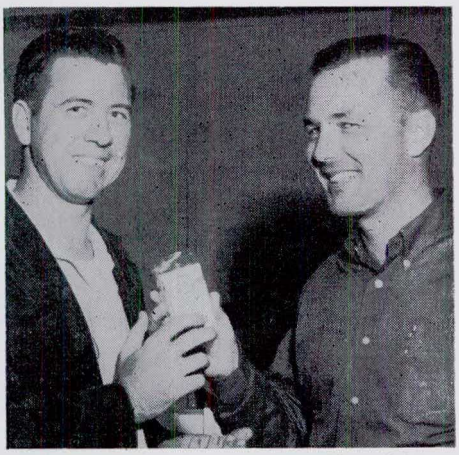
Prize committeemen were (from left), Donald B. Schell, who served as emcee; Joseph J. Ranna, Annual Outing Chairman, and August H. Douglas.



Winner of the Golf Tournament, Johnnie E. Rebold (left) receives winner's prize from August H. Douglas, Jr.



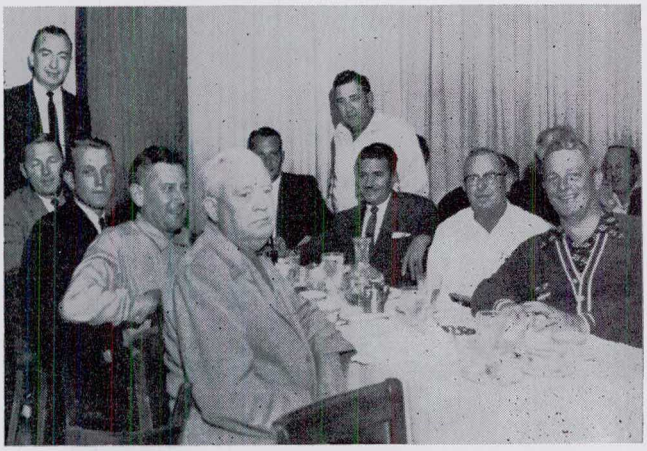
Sharing horseshoe doubles trophy was Harvey J. Martin (above), with his share of prize.



Horseshoe singles victor Ray Maddux (left), is presented prize by Joseph J. Ranna, Annual Outing Chairman.



Enjoying banquet festivities were (from left), Dr. Francis M. Taylor; Dr. Frank W. Macdonald; LES President Roy T. Sessums, and LES Secretary-Treasurer John P. Fernandez.



Metairie Country Club, site of Annual Outing, attracted many to event. This tableful was typical of the numbers in attendance.

Dedicate 'Technical United Nations'

FLORHAM PARK, N. J.—A 675-acre scientific center, described as a "technical United Nations," was officially opened here by Esso Research and Engineering Company.

The facilties, representing the biggest expansion in the 40-year history of the nation's largest oil research firm, were dedicated during a program in which President Eisenhower's scientific adviser, Dr. George B. Kistiakowsky, stressed the importance of basic research in international affairs.

The center includes three structures housing some 800 engineers, scientists and aides. Initially it will be devoted to engineering and oil processing research. Headquarters activity and other research will continue at the company's 20-building facilities in Linden, N. J.

Governor Robert B. Meyner of New Jersey and top executives from the company, including President Eger V. Murphree of the parent firm, Standard Oil Company (New Jersey), and affiliates, also took part in the program.

Marion W. Boyer, a Jersey Standard director and formerly general manager of the Atomic Energy Commission, said the new center "mirrors what is surely one of the most dramatic business developments in recent years: the rapid growth of industrial research into a multi-billion dollar venture." He described the facility as a "miniature technical United Nations."

Tells of Staff Growth

He estimated there are now more than 5,000 industrial laboratories in the United States, in comparison with only 290 in 1920.

Esso Research, he noted, originated in 1919 as a department of the parent company with a staff of only 26 persons. Today there are more than 3,000 employees, one-third of whom are technical personnel.

Other points made by Mr. Boyer:

Research and engineering technology are reducing capital costs by about five per cent per year. In Jersey's case, that would amount to almost $25,000 (million) yearly.

Esso researchers have received more than 7,000 patents in the past 25 years.

Engineers at the new center are planning and supervising some $350,000,000 worth of refinery construction and modernization around the globe. Since World War II ended, Jersey affiliates have built, or have under construction, 24 refineries.

Jersey's investments in petrochemical refining plants should rise to about $400,000,000 by 1962.

The firm's engineering research is under the direction of vice president Charles E. Paules, a veteran of more than 40 years in this field. Vice president E. J. Gohr is in charge of petroleum processing research.

The center will be the fountainhead of engineering skills and knowledge required by Jersey Standard affiliates around the world. At any given time more than 100 Esso engineers are scattered over the globe on specific assignments.

One of the most interesting features of the new research center is the Process Research Building with its 11,000-square-foot bay area that is almost four stories high. In this area, new processes and improved versions of old processes are "scaled up" into pilot plant units. These pilot units are, in essence, small prototypes of large refinery units of the future.

The bay area is illuminated by special mercury vapor lamps that take from 5 to 10 minutes to reach full intensity once they have been turned on. Once going full blast, these lights give a close approximation of bright daylight.

Another feature of the new center is an IBM 704 digital computer which has a new magnetic-core memory complex with a capacity of storing 32,000 words. This big computer can total all the numbers from 1 to 8,000 in a fifth of a second. In one day it can do computations that would take 35 skilled mathematicians their entire lives to work out.

The Computing Center aids scientists and engineers in two ways. It enables them to operate in mathematical realms that were previously out of the question. It gives them more time for creative work by doing time-consuming calculations for them.

Another feature of the center is a large Electronic Associates analog computer. This equipment includes five graph plotters for recording outputs, plus aspecial oscilloscope display for plotting up to eight output 'curves" simultaneously.

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Plan 2 New Louisiana Plants

Two companies have signified that they will inject millions of dollars into the economy of Louisiana by building multimillion-dollar plants.

One of the plants, to be built by Goliad Corp., will take its place in the area between Baton Rouge and New Orleans, the "new petro-chemical center of America." The other plant, which will be constructed by Continental Oil Co., will be in Westlake.

Goliad Corp., a Houston firm, will build a new multimillion-dollar hydrocarbon fractionation plant on the Mississippi one-half mile north of Geismar. It has been estimated that the projected fractionation plant will cost from $3 to $4 million.

Construction on the 70-acre site is to begin within the year. Commenting on the new addition to the petrochemical industries in the state, Curl Siegelin, executive director of the Department of Commerce and Industry, said that "since a hydrocarbon fractionation plant produces basic chemicals in the petrochemical complex, this plant might well draw other chemical plants to the immediate vicinity."

Continental Oil Co's. new plant, which is to cost $10,715,000, will be located at Westlake in fast-growing Calcasieu Parish. Construction is slated to begin near the end of 1959.

The new petrochemical plant will produce straight-chain primary alcohols and will provide 120 permanent jobs and 200 temporary construction jobs. Construction is to be completed early in 1961, when the plant will begin operations.

Time Now To Mail Before Christmas

Postmaster A. Frank Fairley says, "Early mailing of Christmas cards and gifts is the biggest single factor in getting all mail delivered before Christmas."

New Orleans Post Office facilities have been expanded to include space loaned by the New Orleans Port of Embarkation for processing incoming parcel post mail. In addition many temporary employees will be addded and an extra fleet of government and privately-owned vehicles will be employed to handle the anticipated record volume of mail.

Follow These Rules

To insure prompt and safe delivery of our Christmas gift packages, Postmaster Fairley asks us to follow these three simple rules: wrap them securely—address them correctly—mail them early! Wrap your Christmas gifts carefully by using heavy paper, corrugated cartons, and strong cord. Make sure each address includes full name, street anl number, city, zone and state.

You can speed delivery of your Christmas cards by securing free labels from the post office indicating **"All for Local Delivery"** and **ALL for Out of Town Delivery,"** then sort and tie your cards in two separate bundles with the addresses all facing one way.

Be sure to use only first class four-cent, or seven-cent air mail postage on your Christmas cards. This enables you to include hand written messages on the cards and, also, cards sent by first class mail are given forwarding or return service, if necessary, whereas cards that are mailed at the three-cent, third class rate, may include only your signature and will not be forwarded or returned.



Charles Brennan (left), W. S. Nelson.

Engineer Meets The Press

An expanded five-year curriculum for Louisiana's engineering schools was envisioned by a New Orleans consulting engineer in the course of an educational TV program.

This was a highlight of a discussion on the future of engineering in the state by Waldemar S. Nelson, and LES past president, on WYES-TV's "Meet The Press," a public affairs presentation.

Participating in the program were Charles Brennan, public relations director of Loyola University of the South, moderator, and panelists Vincent Randazzo, Times-Picayune news and feature writer, Gary Hymel, New Orleans States-Item news and feature writer, and Dave Snyder, States-Item general assignment reporter.

Mr. Nelson told the panel of the future possibility of 40-story skyscrapers in South Louisiana, and dwelt on he feasibility of Monorail transportation systems.

The panelists also quizzed Mr. Nelson on the topics of the Freeport Sulphur Co.'s offshore sulphur project; Moisant International Airport runway extensions, engineering of the Old River locks, the new Bestwall Gypsum plant on the new Mississippi River Gulf Outlet and nickel ore production in Cuba, all projects of interest to his firm, Bedell & Nelson Engineers, Inc.

Traces Project Development

Piping In S. Louisiana Prosperity

In Assumption Parish, Louisiana, installation of more than 160 miles of Cast Iron Pipe will make life more comfortable for 18,000 people

Hard-boiled construction men blinked their eyes and gaped as a woman walked out of her home alongside the bayou carrying a pot of coffee and ten cups on a tray, and offered a cup of the strong brew (thick, black Louisiana variety) to each member of the pipe-laying crew.

One man said: "Usually we get cussed out when we dig a trench through someone's front yard."

In subsequent weeks the men encountered similar gestures of friendliness as they worked up and down Assumption Parish, Louisiana, installing a cast iron pipe water distribution system that will stretch out for more than 160 miles.

Women brought coffee to the workmen simply because they were delighted to have a water system installed.

Assumption Parish is in the heart of Louisiana's sugar cane country, about 60 miles west of New Orleans. In July, for the first time in their lives, some of the people were able to turn on faucets and enjoy an unlimited supply of pure water. By October about 95% of the parish, including most of the homes on back country roads, was connected to the new system.

Until 1959, only those living in the northern part of the parish, could claim anything approaching a dependable water supply. And even here, the water, obtained from wells, is extremely hard, and has proved costly to soften.

Napoleonville, the parish seat, has had a water system for many years, but the supply, also drawn from wells, has been unsatisfactory both in quality and quantity.

From a point about four miles below Napoleonville to the southern fringe of the parish, it has not been worthwhile digging wells. Salt water seeps in, even though the area is some distance from the Gulf of Mexico, and there is often a marsh gas taste in the water.

And so most people have had to obtain water for drinking and cooking by collecting rain water in cisterns, or by hauling in a supply.

In 1958, when drought laid hold of the area for several months, tank trucks called regularly at hundreds of homes, selling water for $10 per thousand gallons.

Many who live along the bayous have piped water from these sleepy streams into their homes to flush toilets, and in some cases have boiled bayou water for drinking.

People first started talking seriously about a water system five or six years ago, after facilities were constructed to pump Mississippi River water into Bayou Lafourche, which winds through the middle of the parish on its way to the Gulf.

Neighboring Lafourche Parish installed a water system, using this transplanted Mississippi water for a supply, and people in Assumption thought they should do the same thing.

The big question was: could the parish finance such a project?

The Assumption Parish Police Jury got the ball rolling.

On July 10, 1956, the Police Jury adopted an ordinance creating Assumption Parish Waterworks District No. 1 with boundaries the same as those of the parish.

J. B. McCrary Engineering Corporation, of Atlanta, was engaged to make a feasibility report, to determine whether an adequate system could be designed and installed within taxing limits of the parish.

When the report proved favorable, an election was called for March 12, 1957, to vote on bond issues totaling more than three million dollars.

More than 630 resident property taxpayers, representing a property assessment of approximately $1,160,000 (15 to 20% of actual worth) voted in favor of the bonds, and less than 60, representing a property assessment of about $150,000, voted against them.

In voting yes, people knew they were increasing taxes by 10 mills—yet they voted yes by a majority of more than 10 to 1.

Bond issues were sold as follows, under the supervision of Foley, Cox and Judell, bond counsel of New Orleans.

1. $1,065,000 of public improvement bonds of the parish, to be paid from unlimited ad valoreum taxation. Part of the proceeds will be used to purchase fire-fighting equipment. A tax of five mills has been imposed to amortize these bonds.

2. $1,065,000 of public improvement bonds of the water district, also payable from unlimited ad valorem taxation. Like the parish, the water district has set a tax of five mills to pay off the bonds.

3. $1,200,000 of water revenue bonds, to be paid solely from water system income.

Bonds were sold in July, 1958, and that same month the contract for furnishing the laying pipe was awarded to Hebert Brothers—Engineers, of Plaquemine, Louisiana.

Included in the new system are a treatment plant just south of Napoleonville with a capacity of 1 mgd; three elevated storage tanks (two holding 150,000 gallons and the other 100,000); approximately 450 fire hydrants, installed 1,000 feet apart in populous areas; and a two-way radio system.

The following quantities of cast iron pipe (all with single rubber gasket, push-on joints) are being installed:

10 "—650'
8 "—81,000'
6 "—374,000'
4 "—50,000'
2 ¼ "—350,000'

In one populous area, the contractor found it was cheaper to put in a two-main system—a 6" line on one side of the street and a 2¼" line on the other—than to make repeated borings under a hardtop road for service lines.

Down the east side of Bayou Lafourche, pipe had to be laid for mile after mile through front yards. It is believed that the highway here will be widened in future years, and so pipe was placed where it would not have to be moved.

Along this stretch many flowers and shrubs had to be dug up, and replanted after pipe was laid. Sometimes it was necessary to dig the trench and backfill by hand.

Outside many homes along another bayou, crews found clusters of small pipes. Some brought water from the bayou into homes for use in flushing toilets; others carried the overflow from septic tanks back into the bayou; still others were gas pipes. Here the big ditching machines had to be given an enforced rest, and small backhoes used to dig carefully around these small lines.

Crews in Assumption Parish waste no time getting pipe into the ground. Because of an unusually high water table, men installing pipe work immediately behind the ditcher, and the back-fillers follow on their heels, to finish the job before water seeps in and fills the trench. Pipe was installed with 30" of cover.

Charles H. Smith, division engineer for J. B. McCrary in Thibodaux, Louisiana handled preliminary surveys for the project and supervised construction.

Omer J. Hebert rode herd on the job for the contractors, and Amos Airhart was chief inspector for McCrary. Mr. Airhart will become superintendent of the system when it is finished.

Follow one of these men around for a day and it becomes apparent how much the system will mean as Assumption Parish residents. When one of them enters a lunchroom, or stops to examine part of the project, or merely walks down the street, someone is sure to ask how the job is coming along, when the line is going down such and such a street, where the hydrants are going to be located—or, say, what will that water taste like anyhow?

Recently a chap said to Mr. Hebert: "We've been drinking cistern water so long maybe we won't like anything else; maybe this new water won't agree with us."

Hebert Brothers employ about 55 men on the job, most of whom were hired in the parish. This means that much of the money being spent is staying in the area. The project has given employment to many seasonal workers in the sugar cane industry who are busy indeed when there is cutting and hauling to be done in the cane fields, but not so busy the rest of the time. The fact that most of the workmen have had no previous experience with water pipe indicates how easy it is to install Cast Iron mains equipped with the new joints. In mid-April, two crews were laying pipe at the combined rate of 1 to 1½ miles a day.

Assumption Parish Water District No. 1 has purchased the Napoleonville water system, for $40,000, and will tie it into the new system after modernizing and expanding it, and replacing substitute material in some existing lines with Cast Iron Pipe.

An important factor in selling the revenue bonds was that the district would start operating with 509 customers in Napoleonville accustomed to using water and paying rates similar to those proposed by the district.

Before bonds were sold, 1,325 more people signed applications for water service and deposited $10 each.

It is anticipated that the new system will supply 2,500 services by late fall—a figure officials did not expect to reach until toward the end of 1960.

The water district has set up the following rate schedule: first 2,000 gallons, $2.75 (minimum charge per month); next 5,000 gallons, $1 per 1,000; next 8,000, .95 per 1,000; next 10,000 .85 per 1,000; next 10,000, .75 per 1,000; next 15,000, .50 per 1,000; next 50,000, .40 per 1,000.

Net revenue is expected to total approximately $62,000 in 1960, and about $150,000 annually by 1975.

Population of the parish is now estimated at about 18,000. With a good water supply assured, it is anticipated that new developments will spring up shortly.

A gas pipeline company is already considering the installation of a natural gas plant in the parish. If built, the plant will require approximately one million gallons of water daily. Even before the system starts operating, therefore, it may be necessary to plan an addition to the treatment plant, and larger mains.

Assumption Parish economy depends principally on agriculture, with sugar cane the main crop, and upon the oil industry. Five large sugar mills grind more than 670,000 tons of sugar cane annually.

The parish receives well over $100,000 each year from severance taxes levied by the state on oil and gas companies.

EJC

(Continued from Page 10)

AAAS Meeting This Month

The 126th meeting of the American Association for the Advancement of Science will be held December 26-31, 1959 in Chicago. Of particular interest to engineers will be:

Section M-Engineering Program (Secretariat served by EJC's Secretary) will include four sessions (Dec. 28-29) on the vexing problems of national and international aspects of systems of units, under the unlikely but commendable goal of SCUDS (Simplocation, Clarification, Unification, Decimilization, Standardization). Sessions: The Confusion of Chaos in Units; Public Education vs. Consumer Public; Problems of Design, Manufacture and Commerce; The Look to the Future.

Joint Section M and Section E Program on the Great Lakes Basin—Dec. 29 and 30—engineering features include navigation, power, transportation, water utilization, beach erosion and water supply.

Engineering and Scientific Manpower Session—Dec. 28—co-sponsored by the Engineering and Scientific Manpower Commissions, the National Science Foundation and the National Research Council—Higher Education and Training in Emerging Fields of Technology; panel presentation by distinguished scientists and engineers on manpower implications in nuclear and space sciences, chemical fuels, metallurgy, oceanography.

Engineers Review State's Finances

Editor's Note: As we move into the final quarter of 1959 it seems advantageous to supply Society members with some idea of Louisiana's financial condition as expressed through a study of bank capital structures. The essential soundness of the industrial and commercial economy of Louisiana is graphically portrayed in the special report printed below. We are grateful to Mr. R. Irby Didier, Executive Secretary of the Louisiana Banking Assn. for this survey

By R. IRBY DIDIER

To get ready and to meet the industrial expansion of Louisiana, the banks in the Pelican State have done a remarkable job in increasing their capital structures.

Last year alone, the banks in Louisiana increased their capital by some $21 million, an increase of 10% over the previous year.

In the postwar period, since 1945, banks in Louisiana have increased capital by some 210%, against a deposit increase during the same period of around 75%.

During the past two years total deposits in all the banks in Louisiana have increased only $7 million, while the total increase in capital funds has been near the $40 million mark.

Of course this seems odd, and demands an explanation. During the past two years there has been a large withdrawal of public fund deposits in Louisiana banks. Increasing State public fund expenditures during that period exceeded estimated income, thereby reducing the once large surplus in the State treasury and its agencies.

AS OF DECEMBER 31, 1958

Table includes all banks in cities with combined resources over $25 million.

Area or City	Total Resources	Capital Funds
NEW ORLEANS (6)	$1,115,895,000	$ 74,948,000
Suburban N. O. (5)	91,147,000	7,184,000
	$1,207,043,000	$ 92,132,000
NORTHWEST LOUISIANA		
Shreveport (5)	$ 347,535,000	$ 31,205,000
Bossier City (2)	32,135,000	2,208,000
	$ 379,670,000	$ 33,413,000
NORTHEAST LOUISIANA		
Monroe (3)	$ 89,135,000	$ 7,655,000
CENTRAL LOUISIANA		
Alexandria (3)	128,008,000	10,525,000
SOUTHEAST LOUISIANA		
Baton Rouge (5)	264,024,000	18,889,000
Hammond (2)	27,445,000	1,506,000
	$ 291,469,000	$ 20,395,000
SOUTHWEST LOUISIANA		
Lake Charles (3)	$ 135,730,000	$ 10,021,000
Crowley (2)	27,809,000	3,240,000
	$ 163,539,000	$ 13,261,000
SOUTH CENTRAL LOUISIANA		
Lafayette (2)	$ 65,174,000	$ 5,269,000
Houma (2)	45,191,000	2,721,000
New Iberia (4)	33,438,000	2,865,000
Opelousas (3)	31,273,000	2,075,000
Thibodaux (2)	30,727,000	2,359,000
	$ 205,603,000	$ 15,289,000
1958 Totals	$2,437,022,000	$192,267,000
1956 Totals	2,416,476,000	144,923,000

A large number of banks in Louisiana during that period, while announcing a decrease in public fund deposits, have announced that commercial and time deposits have increased considerably.

Percentagewise these larger city banks during the past two years have increased their capital accounts over 33%, truly a sign that the bank executives in Louisiana have an eye toward future industrial expansion in their State.

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Begin Two New Vessels

Work has been started at Avondale Marine Ways, Inc., on two of three ships to be constructed for the Delta Line under a $30 million contract.

Big cranes set in place two huge sections of steel which will form part of the hulls of the vessels.

Present for the keel-laying ceremony were Capt. John W. Clark, president of the Mississippi Shipping Company, operators of Delta Line; James H. Bull, president of Avondale; Thomas A. King, Gulf director of the US maritime administration, and Neal Baker, construction representative, office of ship construction of the maritime administration.

The vessels, which are freighters, are first of a $180 million replacement project embracing 14 ships to be launched in American shipyards.

Work on a third ship will be started in about four months, depending on the steel situation, said Capt. Clark.

Work on them will raise the number of workers at Avondale from 2000 to a peak of 3000 in 1960, said the plant's president. The contract for them was won by Avondale in competitive bidding.

The company's low bid was $9,802,718 per ship, with delivery due in 1961.

The new craft will be 10,760-ton ships with service speed of 18 knots, overall length of 506 feet, 70-foot beams, design draft of 28 feet, and 60-ton Stuelcken heavy lift equipment, first to be used on an American flagship, said Avondale president Bull.

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Moisant

(Continued from Page 9)

some $800,000 in its coffers.

In 1952, with 122 daily schedules, Moisant handled 635,000 passengers—more than the population of New Orleans.

To assure proper provision for the long-term future, the Board as early as 1952 called for economic and engineering studies to develop a complehensive, long-range plan.

As the New Moisant Terminal Building was dedicated on November 11, most "critical" parts of the master plan were complete. On the field, the main instrument runway (direction) is being lengthened to ultimately extend to 9313 feet as Federal matching funds become available.

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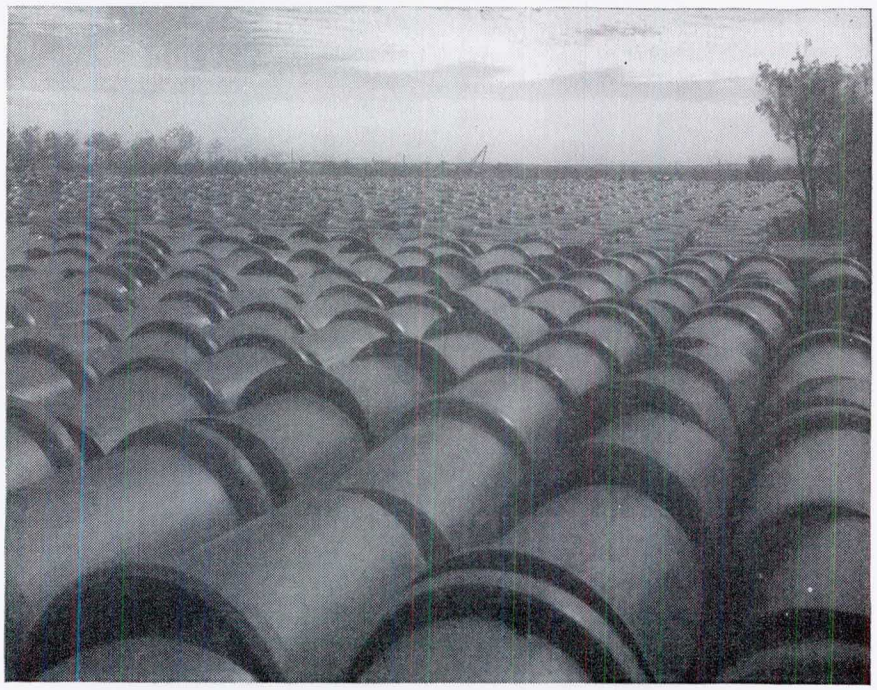

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Memorials

MICHAEL HARRIGAN REILLY

It is with regret that we record the untimely passing of Michael Harrigan Reilly on Friday, July 31, 1959, after a brief illness of two weeks. "Mike," as he was affectionately known to his many friends and business acquaintances, was an active member of the Louisiana Engineering Society for the past nineteen years.

Mr. Reilly was a native New Orleanian, born in this city April 13, 1907. His primary schooling and advanced education were received at Saint John the Baptist elementary and Warren Easton High, and furthered at Tulane University night-school.

While attending night-school, he was employed as a messenger boy in the Engineering Department of the Illinois Central Railroad. To better himself and gain more experience in his choice of a career, he left I. C. and became associated with the firm of M. J. Flynn, General Contractor, who was engaged in extensive drainage work in the city.

The nationwide depression of the early '30's caught Mr. Reilly in its resultant wave of unemployment, but creation of the Work Projects Administration by the Federal Government gave him a new start. His background and knowledge of the type of work being undertaken, together with his inherent traits of a go-getter and a leader of executive ability, were soon recognized. Within a short period he was elevated to Superintendent of Construction in the New Orleans area. He remained with W. P. A. for five of the seven years of its existence.

The scope and volume of completed public works in an daround the city, which included installation of miles of city-water mains, sewerage and drainage, levee building and street paving, can no doubt be remembered by many. One of the largest of Mr. Reilly's projects, in which he was placed in full charge of more than 10,000 men, was the development of some 1100 acres of land acquired by the city for a large extension to City Park, including a new 18-hole municipal golf course. Today, this park with its beautiful landscaping, gardens, lagoons and paved drives, is evidence of a job well done.

At the outbread of World War II, the Corps of Engineers, U. S. Army, New Orleans District, engaged Mr. Reilly as a civilian employee. he served this organization in Panama and Brazil, in charge of military installations which included encampments, airfields and road building. In 1945, after a period of five years in South America, he returned to his native New Orlean and finally realized an ambition of many years by launching his own business as a General Contractor.

In his youth, Mr. Reilly was quite proficient as an amateur boxer, but never gave thought to becoming a professional. He was a member of the Young Men's Christian Association, for several years prior to the time of his death he was a popular member of the New Orleans Athletic Club, and took a personal interest in all of the institution's many activities.

He was of the Catholic faith and a member of Saint Matthias Church.

Mr. Reilly is survived by his widow, the former Thelma Palmisano; a daughter, Gaylyn Ann Reilly; three brothers, William T., Edward E., and Cornelius J. Reilly; and a sister, Mrs. Albert J. Songy. To the bereaved members of his family we extend our heartfelt sympathies.

Be it resolved that this obituary be read at a meeting of the Louisiana Engineering Society, entered into the minutes, published in the Louisiana Engineer, and that copies be sent to the members of his family.

D. E. Guiza
W. K. Bankston
David Moodie

WILLIAM D. ROLAND

The passing of a man that had thousands of people who loved, admired, and honored him, occurred on October 18, 1959. In leaving this life, many things for the betterment of the Community, State and humanity in general, must be credited to his memory. He took part in, and was instrumental in pioneering many worthwhile projects for the betterment of his fellow man. This man was William D. Roland who died on October 18, 1959 in the prime of his life while still carrying on a fruitful and active career.

Mr. Roland was born on January 9, 1910 at Conyers, Georgia. He came to Alexandria with his parents when he was five years old and has spent his life in Alexandria since that time. Before opening his own Engineering and Construction firm in Alexandria he was active in construction work with several firms and taught high school in Hammond, Louisiana. Mr. Roland received his high school education at Jefferson Military College and was Valedictorian of his graduating class. He received his higher education at Southeastern Louisiana Institute and Louisiana State University.

Mr. Roland was a member of the Louisiana Engineering Society and a Charter member of the Alexander Section. He was a past Vice President of the Section. He was very interested in forwarding the Engineering profession. He was a member of the Optimist Club, where he was instrumental in establishing their Boys Club. He was a past president and was a member of the International Board of Optimists when he died. He was chosen as "The Optimist of the Year" in 1958. He was a member of the First Methodist Church of Alexandria and was also a Mason and a Shriner.

Mr. Roland was married to Frances B. Bunch in 1930. He is survived, in addition to his wife, by one son, W. D. Roland, Jr., five brothers, one sister, three grandchildren, and his father, Robert L. Roland.

Be it resolved that this Obituary be read at a meeting of the Alexandria Section of the Louisiana Engineering Society, entered into the minutes of the Society, and be published in the "Louisiana Engineer," in the Proceedings of the Society, and that copies be sent to the members of Mr. Roland's family.

O. E. BARRON

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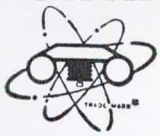

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INDEX OF ADVERTISERS

	Page
A-1 Employment Service	16
Airtemp Division, Chrysler Corp.	5
American Creosote Works, Inc.	25
Connecticut Mutual Life Insurance Co.	20
Creole Engineering Company	21
Central Louisiana Electric Company	21
Delta Visual Service, Inc.	11
W. S. Dickey Clay Mfg. Co.	23
Equitable Equipment Co., Inc.	5
Eugene Dietzgen Co.	26
Golden Anderson Valve Specialty Co.	6
Gulf States Utilities Co.	6
Gurtler, Hebert & Co., Inc.	2
Allan J. Harris Co.	26
A. M. Lockett & Co., Ltd.	14
LA-MO Refractory Supply Co.	22
Marshland Seaplane Service	22
McLellan Equipment Co.	11
Menge Pump & Machinery Co., Inc.	17
Mutual Benefit Life of Newark, N. J.	22
New Orleans Blue Print & Supply Co., Inc.	25
Pan-American Films	11
Professional Listings	12-13
Reagan Equipment Co.	6
Shilstone Testing Laboratory	28
Southern Bell Telephone & Telegraph Co.	25
Steel Service, Inc.	3
Underwater Services, Inc.	3
United Gas Corp.	26
Williams-McWilliams Industries, Inc.	28
Yarberrys'	22

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