

THE PROCEEDINGS

OF THE

LOUISIANA ENGINEERING SOCIETY

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Arthur M. Hill, Editor

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LOUISIANA ENGINEERING SOCIETY

Vol. 41

MARCH, 1955

No. 1

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Our New President. Mr. Mallard Seago is the 57th president of the Louisiana Engineering Society. Mallard is a native of New Orleans, and is at present Superintendent of Mechanical Operations, Power Division, New Orleans Public Service Inc.

President Seago has been a member of the Society since 1938. He is a registered mechanical and electrical engineer.

Our new president is active in various civic and professional groups. He has held the office of Chairman, New Orleans Section, American Society of Mechanical Engineers; Secretary-Treasurer of the Engineers' Club of New Orleans. He holds membership in the Chamber of Commerce and the Propellor Club.

The Seago family consists of his wife Helen, and three children, Robert Jr., Mary Helen and John Vincent.

A Message from Our President. Have you ever asked yourself the question, "Why do I belong to the Louisiana Engineering Society?" This is a fair question and all of us should have the right answer to it.

For many years, certainly for as long as I can remember, the National Engineering Societies have tried, without success, to get together on a common basis toward the formation of a combined Engineering Society, an American Engineering Society similar to the American Medical Association.

These attempts, on a National level, have always failed, due probably to the unwillingness of the various Parent Societies to forego their individual identities in the interest of concerted effort. This continued failure is, admittedly, the basic political weakness of the Engineering profession and is, to my way of thinking, the fundamental reason why, whether we like it or not, the profession of Engineering is seldom mentioned in the same breath with those of Medicine and Law.

Certainly, when we look at the bridges, roads, buildings, factories, refineries and all the many monuments to engineering ingenuity and know-how, we realize that our profession should take a back seat to none. Would you like to fly in a plane designed by a Doctor of Medicine or a Lawyer? Of course you would not. But, don't forget, the other professions are, through concerted action, continually publicizing the fact that they *are* professions while we, on a national level, go our individual ways jokingly called ditch diggers, plumbers and electricians.

Please understand, I do not intend that these remarks be construed as criticism of National Engineering Societies or their Local Sections. They have a definite and irreplaceable function in our profession but this function, from my observation, is largely confined to the technical phases of specific branches of the Engineering Profession. Little if anything can be accomplished toward the betterment of our standing as a profession by relatively small groups acting independently in their own particular interests.

You will note that I emphasized "on a National level," for I honestly believe that we engineers in the State of Louisiana have, for many years—57 to be exact—accomplished the means for unified, concerted action in the Louisiana Engineering Society. In our Society, over all these years, all branches of our Profession have worked together to better the standing of the Engineering Profession in our State. Individual and specialized group desires have been placed in the background in favor of overall improvement.

Please understand, however, I have no hallucinations that the LES is the final answer to all our problems but, at the same time, there is no doubt in my mind that we, in Louisiana, are far better represented on a State level than our profession, in general, is represented on a National level. Here, the Louisiana Engineering Society can speak for all branches of our Profession.

Some of you might ask why the Louisiana Engineering Society should take it upon itself to speak for the engineering profession in our State. This is not a difficult question to answer.

First, the Louisiana Engineering Society, with some 1600 members, is by far the largest single engineering organization in our State.

Second, the greater majority of LES members are also members of one or another of the national engineering organizations.

Third, the LES always makes it a practice to consult with the Local Sections of the various national engineering organizations before taking any action affecting the profession in general.

Fourth, the LES is recognized as the representative body for the engineering profession as evidenced by the fact that the State Legislature specifically wrote into the licensing law the provision that the Members of the State Board of Registration must be chosen by the Governor from a list submitted by the LES.

Fifth, practically all engineers of any prominence in our profession in Louisiana are members of the LES.

Sixth, the Board of Direction of the LES meets regularly each month throughout the year to discuss and remedy, where possible, the many problems which arise.

Seventh, many prominent engineers and executives who have reached positions of prominence through engineering give willingly of their time in carrying out special LES committee assignments.

The list of reasons could go on and on but, I believe, it is now time to examine why the LES is able to accomplish these things. The answer is surprisingly simple. It is not difficult to get the best men in our profession to work for and support activities when they know that these activities will eventually receive due consideration at the top levels for the betterment of engineering in our State. In other words, I sincerely believe that the heart of our Society—its real strength—lies in the interested committeemen and committee chairmen.

MALLARD SEAGO
February 10, 1955

Vocational Guidance Committee Report for School Year 1953-54. During the 1953-54 school year the committee activities were as follows:

BATON ROUGE SECTION

J. A. Affolter, Jr., Chairman, Vocational Guidance Committee. Participated in five Career Days with eight high schools represented.

Total number of students attending.....	635
Total committee member visits	46

In addition to the Career Day activities the following was accomplished:

1. Provided a speaker for the Mathematics Club at Baton Rouge High School.
2. A set of "Speakers Aid" slides were prepared for the section by Esso Standard Oil Company.
3. Obtained and arranged for showing of Allis-Chalmers film, "The Hidden World" at Baton Rouge at Istrouma High School.
4. Provided information regarding Professional Engineering to High School students of the Baton Rouge area.
5. Further developed the reputation of the committee as the source of engineering career information.

"Our keynote this year has been "follow up." We have stressed our desire to be of additional service to the schools after we have made our presentation in the Career Day Programs. A copy of the Committee's Speaker Roster has been given to each of the high school guidance counselors with the invitation to call on us for any needed information with respect to the profession of engineering. We have supplied considerable information because of this effort and have more completely strengthened our liason with the school teaching personnel in our guidance work."

MONROE SECTION

Arthur C. Thigpen, Chairman, Vocational Guidance Committee.
As Chairman, Mr. Thigpen reports as follows:

1. Visited and talked with students interested in engineering at Ouachita Parish High School, Monroe, La., 3/19/54.
2. Visited and talked with students interested in Engineering at Bolton High School, Alexandria, La., at their Career Day Program.
3. Other members of the faculty visited schools in North Louisiana on their Career Days.
4. During Engineers' Week, February 21-27, 1954, posters were sent to some 60 high schools in North Louisiana to call Engineers' Week to the attention of the students. In addition, the posters invited all interested students to the Annual Engineer's Day at the Louisiana Tech campus on April 3, 1954. Several radio programs and a television program were put on emphasizing to the public the role of the engineer.

5. On Saturday, April 3, 1954, the School of Engineering at La. Tech held its Annual Engineer's Day. The public was invited and some 300 high school students who had, in a recent survey, given engineering as their preference, were invited by individual letter.
6. The public, all high school students and high school teachers were invited to a panel discussion on "Preparation for Engineering and Scientific Profession," held in the Engineering library in conjunction with the Engineer's Day Program.

Letters and Notices are enclosed which were used for the above activities.

NEW ORLEANS SECTION

Visited 10 High Schools.

Addressed approximately 1150 students.

Two of the visits included in the above were on Career Days.

One plant visit was arranged, under the guidance of Mr. R. M. Rombach, Jr., as a "trial" to determine the merits of such an activity. Thirty-two students from 7 schools were taken, on a Saturday morning, to the Kaiser Al. and Chem. Co. plant at Chalmette. This trip proved so successful that your committee strongly recommend that all L.E.S. sections arrange plant visits for high school students who may be interested in engineering.

Members of the committee participated in "Engineers' Week" and "tied-in" this program with vocational meetings at high schools.

The writer attended Career Day at Francis T. Nichols Jr. College of L.S.U. at Thibodaux, La.

Eleven high schools from 6 parishes were represented and Mr. Carroll, Assistant to the Dean of Engineering at I.S.U. and the writer addressed two groups of students (totaling 35) interested in engineering.

Members of the N. O. Committee took part in Tuane University Engineers' Day.

Jets Program. The most important undertaking during the year was the Jets Program. This work is conducted by a "Sub-Committee for Jets" with Col. J. T. Knight, Jr., as Chairman.

After much research and diligent effort on the part of this sub-committee one Jets unit has been organized at De La Salle High School. A second unit should be organized within the next 30 days at Fortier High School. It is expected that a third unit will be organized within the next 60 days at Martin Behrman High School.

The Jets Program has such great possibilities that your committee will, after results can be evaluated, recommend to all L.E.S. sections, this program as a permanent vocational guidance work.

No reports on Vocational Guidance work were submitted by the Alexandria, Lake Charles or Lafayette Sections.

SHREVEPORT SECTION

R. M. Hood, Chairman, Vocational Guidance Committee.

1. Number of Schools visited—3
2. Number of Students present—184
3. Number of Career Days in which your committee participated—3
4. Other Vocational Activities or Assistance rendered to Schools:

We contacted each high school in this area—also Centenary College which sponsors one Career Day each year for High Schools in this area—and advised them that we would be glad to work with them on their vocational guidance problems. This resulted in several of our members being invited to participate in Career Day Activities at the various high schools.

In conclusion I wish to commend and thank each and every committeeman who has unselfishly devoted time and effort to this work.

Respectfully submitted,

CHAS. P. KNOT, Chairman,
Vocational Guidance Committee
Louisiana Engineering Society.

PROBLEMS ENCOUNTERED IN THE CONSTRUCTION OF ALVIN CALLENDER AIRFIELD*

Delivered to the Louisiana Engineering Society, New Orleans, Louisiana, Annual Meeting, 15 January 1955.

The Alvin Callender Field about which I am going to talk is officially known as the Joint Air Reserve Training Center. It is the first time a training center has been established for Reserve aviators of the three services. The Navy is the host activity and will construct and operate the field.

This Joint Air Reserve Training Center is located adjacent to the present Avin Callender Field at Belle Chasse, and consists of approximately 3,000 acres of land. The terrain is heavily wooded, swampy and varies in elevation from -4.0 to +5.0 M.G.L. with most of it on the low side.

The project is being financed by the using services. Funds appropriated to date amount to \$19,080,525 for the Navy; \$1,394,050 for the Air Force; and \$1,675,575 for the Air National Guard, or a total of \$22,140,150. This includes land acquisition and design costs, as well as construction costs.

The following represents total construction planned at this time:

- a. 8,000 ft. runway, taxiways and aprons
- b. First increment of streets and roads
- c. Railroad Spur
- d. Elevated Water Tank
- e. Supply Warehouse
- f. National Guard Hangar
- g. National Guard Motor Pool
- h. Air Force Hangar
- i. Clearing and grubbing for 6,000 ft. runway —
Est. \$15,324,718

Construction drawings and specifications are being prepared for 9 additional contracts:

- a. Water, gas and sewage distribution
- b. Electric distribution
- c. Aviation gasoline storage
- d. Navy Hangar
- e. Operations Building and Control Tower
- f. Public Works Facilities
- g. Radio receiver and transmitter facilities
- h. Water reservoir
- i. Crosswind runway —
Est. \$ 6,815,432

* Address by Commander T. L. Jackson, C.E.C., U.S.N.

Authorization has been approved for these projects:

- a. Balance of utilities, services and roads
- b. Airfield approach lighting
- c. Married Officer's and Enlisted Men's Quarters
- d. Bachelor Officer's Quarters
- e. Enlisted Men's Barracks
- f. Enlisted Men's Subsistence Building
- g. Aviation Ground Training Building
- h. Dispensary

Est. \$ 7,859,850

TOTAL Est. \$30,000,000

That covers the scope of the work and gives an idea of what we are now building, and what we will advertise in the near future.

The project for a Joint Air Reserve Training Center at Alvin Callender apparently originated in 1950, and was referred to the Army and the Navy for engineering studies based on expansion of the New Orleans Airport. These studies revealed that the cost of extension of the runways would be prohibitive.

A Feasibility Study was made in the vicinity of Alvin Callender Field. The conclusions indicated that the construction of a Joint Air Reserve Training Center on the proposed site was feasible.

Appropriations were made for the project and authority granted to secure options for the transfer of the land.

Maps were prepared showing exact location of the 112 tracts of land involving 78 ownerships and was sufficient for conveyance of title. The intricate recording of instruments in the Registrar of Deeds office and the peculiar surveying setup of land sections in Plaquemines Parish made the securing of these maps most complicated.

Appraisal reports were obtained from two local appraisers which set forth in detail the estimated fair market value of the land and improvements.

Appraisals for aviation easements were obtained as follows:

- a. A circle of radius of 12,000 feet wherein no obstructions will be constructed above 150 feet in height from the ground level as extended from a reference point on the airfield.
- b. Appraisals for the approach zone easements extending from each end of the runways for 1000 feet and provides that no obstructions shall exist within the flight path which in this instance is a 50-1 glide angle. This work is estimated to cover approximately 300 individual ownerships.

In perfecting title in the United States it is necessary to close the transfer by direct purchase or by condemnation proceedings with Declaration of Taking. In the event that an agreement cannot be reached with the owners as to a price to be paid for the land or if the title is such that the person claiming ownership cannot convey the title without an unreasonable amount of curative work to be performed, then the proceedings continue in the trial of the matter before the Court and Jury as to the value of the land.

Runway Design

The proposed runway is 300 ft. wide by 8000 ft. long, with provision for future extension to 10,000 ft. The design criteria as established for the runway is for a C-1 Airfield and is limited to one of two conditions—either a 50,000 lb. wheel load with a 150 lb. per sq. in. tire pressure, or a 20,000 lb. wheel load with a 250 lb. per sq. in. tire pressure.

Furthermore, any area susceptible to fuel storage or jet blasts are considered to be areas which should be paved with concrete. These areas include parking areas and 500 ft. on the ends of runways. The remainder of the runway and the taxiway may be either Portland Cement type concrete paving or flexible type Asphalt paving, whichever appears to be the most economical.

With this in mind, the investigation of the site was begun by making borings along the center line of the proposed runway at approximately 100 ft. intervals. These borings were carried to approximately 6 ft. in depth. Upon examination of the borings it was determined that it would be necessary to remove the top layer of organic matter and replace it with better material for the entire length and width of the runway to a depth determined by plotting the profile made from the borings. This depth ranged from 1 to 6 ft. Plateload tests on the natural subsoil were made. Results of these tests indicate that the K values would average between 34 and 60 and the In Place CBR tests in most cases only one or two. In all the soil samples, the In Place Water Content was exceedingly high, and the average In Place Dry Density was low—in some cases as low as 30 lbs. per cubic foot. The existing ground water level as observed in borings ranged from one to three feet below ground surface.

It was apparent from the outset that in order to provide adequate drainage the entire runway would have to be on a fill. The material available locally for fill in building construction is a soil known as river sand or batture sand. In view of the extremely large quantities of fill that would be required, it was determined

that the most important source of the material would be the Bonne Carre Spillway, which is located approximately forty miles northwest of the Training Center site. Tests run on this particular material show it would be acceptable.

Tests on the batture along the Mississippi River proved this source to be unsatisfactory. Therefore our specifications were primarily written around the use of the material obtainable at the Bonne Carre Spillway.

During the time which elapsed between advertising and bidding on the Runway job, prospective bidders sampled the material located on the bottom of the Mississippi River adjacent to Alvin Callender Field and located a large quantity of marine type sand that, upon testing, indicated suitability for fill. Arrangements were made whereby if a successful bidder so desired, he could hydraulically pump the sand from the Mississippi River and store it on an area assigned for that purpose. It may be of interest to note here that this was successfully accomplished and the work was started. Approximately one and a half million cubic yards of sand were stored on the 95 acres set aside for that purpose. The sand on this area reached as high as 18 feet and sloped off to approximately 9 feet.

To get back to the design of the runway, it was determined that a base course of some suitable material must be used between the sand fill and the paved surface. Various combinations of sand, clam shell, sand and reef shell were tested. The dead reef shell used in these tests were prescribed in laboratory tests to pass a 1-inch screen. The densities obtained for mixtures of sand and shell were substantially greater than those obtained from pure shell alone. With a 60% shell, 40% river sand mix, the maximum density noted was 125 lbs. per cubic foot, with a water content of 8%. The tests on clam shell-river sand combination were very close to that of reef shell and river sand results.

After laboratory tests were completed two test panels were built. One test panel had river and sub-base and a base course of 80% dead reef shell and 20% river sand. The other panel had river sand sub-base and a base course material of sand clay gravel.

On the 19th of November the river sand fill operation was begun. At this time it began to rain, and continued for approximately 48 hours, a total of over 12 inches of rainfall occurred with as much as 8 inches of this being recorded in the first 24 hour period. Actually this first rain was not the end for we had a considerable number of rains during the next fifty-five day period. In fact, the total rainfall during the first two months after the beginning of construction of the test panel was in excess of twenty-five inches.

During this time the design of the runway, grade lines, and drainage lines was going ahead. It became apparent that in order to provide adequate drainage for the entire area and to protect the runway paving and base from flooding, it would be necessary to set the runway elevation at approximately 2.5 above MGL. On this basis it would probably be necessary to have more than two feet of compacted river sand fill placed before the beginning of the base course. For this reason, and also in an effort to get out of the mud and the water, it was decided to increase the river sand fill and sub-base to a total thickness of 48 inches.

During the two month rainy period, the contractor dug ditches, pumped the site and installed tarpaulins in an attempt to expedite the completion and testing of the panels. All of these efforts met with only a minimum of success for even when the areas were dried sufficiently well to work them, the sand which could be obtained from any of the available sources was too wet to be placed and compacted.

On 21 January 1954, it was decided to strip off two feet of the extremely wet river sand fill and to haul in sand previously dried in an asphalt plant aggregate drier. After the river sand fill and sub-base material had been compacted, the two base course materials were hauled onto their respective test sections and compacted to proper density. The sections were protected with tarpaulins thereafter until testing of the panels could be initiated. The sand clay gravel section turned out to be more plastic than was originally shown in preliminary tests. Consequently, this material was discarded as unsuitable for a base material.

In the case of the reef shell-river sand mixture the characteristics were the same as had been found by laboratory tests, therefore this material was loaded and tested. Five load tests were run on thicknesses of 11, 17, 27, 31 and 43 inches of the 80% reef shell 20% river sand base course.

The design thickness for the pavement obtained by going into the curve at a settlement of two-tenths of an inch and reading corresponding base course thickness of 30 inches. Normally, the design would consist of a 30 inch paving thickness utilizing a 3 inch high quality asphalt wearing surface with a 27 inch base; however, because of the fact that the CBR values obtained were well below 80 it was necessary to use a 6 inch black base with a 3 inch wearing surface. The asphalt pavement being of more value inch for inch than reef shell-sand mix, the sub-base was reduced to 18 inches. This then would leave a paving design as follows:

A wearing course of one inch with a binder course of two inches, a black base of 6 inches and 18 inches of mechanically stabilized sub-base of sand and shell.

The design of the concrete paved sections was made based on concrete with a flexural strength of 700 pounds per square inch and a factor of safety of 1.40. Triaxial shear tests were made on test specimens of river sand material. The K value was determined to be 272. Using this value and the design charts available it was determined that 10 inches of Portland Cement concrete pavement would be necessary. Further, to provide full support for all edges and corners and to eliminate the possibility of river sand pumping through the joints, a 6 inch compacted thickness of the 80-20 shell-sand course should be placed under all concrete pavement.

After these two design thicknesses had been determined, estimates of cost were prepared to see whether or not the runway pavements should be entirely concrete or whether the flexible pavement should be used where permitted. The estimates indicated that the cost of the concrete paving was probably 25% to 30% in excess of the flexible base pavement, therefore a flexible type runway with 500-foot concrete ends was specified.

Estimate of Subsidence Under Runway

With the possibility of considerable settlement during and after construction of the runway, further investigation was authorized which included a study to determine the runway settlement and a study of the practicability of preloading the runway with surcharge fills in excess of design to accelerate settlement. In order to accomplish the above, test borings, to 100 feet in depth, were drilled at the site.

These borings showed an extremely heterogeneous stratum from the ground surface to a depth of 15 to 30 feet, which consists of very soft to soft clays and organic clays. Beneath this stratum there is a fairly homogeneous stratum of very soft to soft clay with sandy silt layers which extends to a depth of approximately 65 feet. From approximately the 65-foot depth to the 100-foot depth there are strata of medium dense to dense sands and medium stiff to stiff clays.

The first stratum had wide ranges of water content while the second stratum below it had a more uniform and constant range of water contents. At approximately the 65-foot depth, the water contents show a decided decrease, and remain essentially uniform with depth below this point. The precompression for materials in Stratum 1 are very high, approximately 1.0 to 1.4. The compression indices for Stratum 2 are somewhat lower and range from 0.4 to 0.8. Stratum 3 has generally lower compression indices, ranging from approximately 0.2 to 0.5. When the preconsolidation pressures were compared with corresponding overburden pressures, it indicated

that some of the materials in Stratum 1 have been preconsolidated to loads less than present over-burden pressure. Stratum 2 indicated preconsolidated loads greater than present overburden pressures; the Stratum 3, preconsolidated loads are equal to present overburden pressures. Therefore, the only settlement anticipated is in Stratum 1.

The analysis of data indicated that settlements under loads ranging from 500 to 800 pounds would result in a settlement varying from 13 to 28 inches. It is anticipated that approximately 70% of this settlement would take place during the construction period. The magnitude of this settlement would be undesirable under concrete pavement. For practical purposes a settlement of 6 inches under flexible pavement areas and from 3 to 4 inches under rigid pavement after final construction could be tolerated.

Time rates of settlement curves were developed, and from these curves it was determined that the maximum overburden would vary between stations of from 2 to 6 feet. From this information, quantities of material for surcharge were estimated and a study was instigated to determine the method of applying and removing surcharge. For material scheduling it was estimated that 6000 yards per day, or 132,000 per month for sand hauled from the stockpile and 4,000 yards per day, or 88,000 yards per month for overhaul of surcharge was required. It was planned to apply the first increment of surcharge with material hauled from the stockpile. The surcharge could then be moved ahead by overhaul at a constant rate of 88,000 yards per month. Each area will have been loaded for 30 days. This schedule would require a total of 250,000 yards of sand to be hauled from the stockpile for surcharge. An estimate was made of 150,000 yards for settlement, a loss of 25,000 yards in rehandling, and a total of 75,000 yards to be stockpiled at the far end of the job for future use on a crosswind runway. Rehandling would amount to 422,000 yards. In order that we may have the results from the foregoing operation we are setting steel settlement plates at 200 foot intervals at the centerline and edges of pavement and are reading settlement as load is applied.

Field Operations

The contractor used Bulldozers with a long horn-shaped spike attached to the end of the blade to clear the wooded area. After the trees had been cut they were placed in windrows 75 feet high, 200 feet wide and 300 feet long. After saturation with oil these windrows were set on fire. With the concentrated amount of heat, the green material was readily burned.

To obtain a stockpile of one and a half million yards of sand from the Mississippi River, the contractor used a 3500 horse power

dredge having a 30-inch suction, a 100-foot ladder and a 27-inch discharge. It was rebuilt specifically for the depth of dredging on this job.

The anticipated 24-hour daily output was 12,000 yards, with discharge line approximately 8,000 feet from the dredge. He actually produced an average of 20,000 yards of dredge material per day.

While the material was being dredged from the river, operations were being carried on to remove the surface layer of organic matter, roots and light material from the runway where the sand was to be deposited. During the early stage of the operation the stripping was accomplished with a 5-yard dragline using a 150-foot boom. This equipment proved to be too heavy to operate on some of the softer locations, consequently, a dragline with a 2-yard bucket with 80-foot boom was substituted.

From 25 to 30% of excavated material is waste and the remainder is used for fill. After stripping had been started and a sufficient amount of sand fill had been dredged, the contractor began to transport the sand from the stockpile to the runway by the use of small trucks. The first difficulty that he encountered was in the moving of the trucks on the sand stockpile itself. This sand is similar to a beach sand and unless it has the right amount of moisture, it is too soft to hold up the vehicles. The contractor found that even with hauling roads constructed on the stockpile, his production in yardage delivered to the runway was about 4,000 yards in two 8-hour shifts.

Since his schedule required him to produce approximately 8,000 yards a day, he realized he had to use something that would produce at least double the present output. Euclids and Carry-Alls proved that they could move on the stockpile area without the use of plank roads, but with the occasional help of a Bulldozer as a pusher. He therefore stopped the dump truck operation and brought in four 12-yard Pans and twelve 13-yard Euclids. His production went to an average of 8,000 yards a day, with a maximum of 10,000 yards under good conditions. The equipment was loaded at the stockpile with a three-yard and 2, 1½ yard draglines.

The compaction required of the sub-base was obtained by the operation of the spreading equipment which indicated that the river sand was an ideal material for this purpose.

The placing of the sand shell has not commenced; however, it is understood that the contractor proposes to windrow the sand and bring in precrushed shell and mix it with the use of a traveling mixer. This may or may not be the final method employed.

At this time it is desired to mention that the contractor has only experienced two shear failures in his operation; one being the load of the stockpile adjacent to a drainage canal which resulted in an upheaval in the bottom of the canal of about 6 feet. This is a textbook example of what may happen under such conditions. The other occurred with the stockpiling of the waste material removed from the surface of the runway was stored too close to the runway cut. This caused some upheaval in the runway.

Building Operations

All buildings and structures at Alvin Callender Field are supported on pile foundations. The number, kind and length of piles for each structure were determined from boring analysis, testing and design loads.

The borings indicated that a dense sand lense existed at the -70 and -80 foot level. Piles driven to this lense were tested up to a maximum load of 40 tons.

The design load was established at 18 tons. All the foundations for the smaller buildings were designed on this basis.

The boring results further indicated that piles for the heavy structures whose column loads range up to 350 tons would have to be driven to the -90 to -100 foot elevation. At this elevation a stratum of stiff clay was found.

Piles at this elevation were tested to a maximum of 200 tons and a load of 62½ tons was used for design purposes.

A test of a 4-pile cluster showed it to have a group action factor of 0.8.

In the driving of the test piles there was no correlation between the rate of driving and the total load carried. Some of the piles driving the easiest performed the best under actual test.

OBITUARY OF
LESTER F. ALEXANDER

It is with deep regret that the Officers and Members of the Louisiana Engineering Society record the passing of our Life Member, Lester F. Alexander, on December 12, 1954.

To the members of his family the Louisiana Engineering Society expresses its deep regret and heartfelt sympathy.

In addition to the fact that Lester F. Alexander was the head of a very busy industrial concern he found time to devote to many civic activities in the city and community. His loss will be deeply felt by those organizations for whom he had done so much, and by the city and community in which he lived.

The Louisiana Engineering Society was indeed proud to have his name on our roster and counted it a justifiable honor to the Society to have him be the recipient of the Louisiana Engineering Society Civic Activities Medal—Andrew M. Lockett Award in 1951.

The undersigned committee requests that this obituary be placed in the minutes of the meeting and recorded in the Proceedings of the Society.

D. W. STEWART, *Chairman*
M. C. ABRAHM
J. S. JANSSEN

**OBITUARY OF
GEORGE J. RICHAUD**

The sudden death of George J. Richaud on Friday, November 12, 1954 bereft the Louisiana Engineering Society of one of its outstanding members. George's pleasant personality and cooperative spirit made him well liked in his various circles of activity.

He was born in Gibson, Louisiana 47 years ago. He attended Louisiana State University and was graduated from there in 1930 with the degree of bachelor of science in civil engineering. In September of that year he joined New Orleans Public Service as an engineer in the Schedule Division. He was later promoted to the position of research assistant in the Research and the Advertising Departments of the same company. In 1942 George was appointed Superintendent of the Roadway Division, the position he held at the time of his death.

In addition to the Louisiana Engineering Society, George was a member of the American Public Works Association, the Engineers' Club of New Orleans, the Young Men's Business Club of New Orleans, and the Chamber of Commerce. He also gave generously of his time to many civic and community activities.

He is survived by his wife, the former Kathryn Buist, and four children, Catherine Nan, Georgene Buist, George James, and Paul Buist. George held the respect and admiration of his many friends and associates. His presence will be sadly missed by these as well as by his family.

JAMES S. JANSSEN

MARIO J. ZERVIGON

RESOLUTIONS

WHEREAS, the St. Charles Hotel, through its Manager, Captain J. J. O'Leary, and his associates, has so graciously placed at the disposal of this Society its services and facilities for this meeting as well as throughout the past year and previous years, and

WHEREAS, these services and courtesies have provided a meeting place for this Society's annual and monthly gatherings, as well as the headquarters of the Society throughout the years; therefore

BE IT RESOLVED, that the Louisiana Engineering Society extend to our hosts our sincere thanks and appreciation for these services and courtesies, and

BE IT FURTHER RESOLVED, that a copy of this resolution be incorporated in the minutes of the Society and a copy be sent to Captain O'Leary. * * * * *

WHEREAS, the Lane Cotton Mills, in a spirit of fine cooperation, has kindly invited the members and guests of Louisiana Engineering Society to inspect their plant during this annual meeting, and

WHEREAS, this inspection tour will afford us an opportunity both pleasurable and profitable, * * * * *

BE IT RESOLVED, that the Louisiana Engineering Society extend to the Lane Cotton Mills its sincere thanks and appreciation for this courtesy and privilege, and

BE IT FURTHER RESOLVED, that this resolution be incorporated in the minutes of the Society and a copy sent to Mr. J. G. Shedd, Vice-President and General Manager of Lane Cotton Mills. * * * * *

WHEREAS, the Board of Commissioners for the Port of New Orleans, through its General Manager, Mr. E. H. Lockenberg, is so generous in furnishing the yacht "Good Neighbor" for the members and guests of the Louisiana Engineering Society, affording them an opportunity to see the facilities of the Port of New Orleans, and

WHEREAS, the name of the yacht "Good Neighbor" carries out the motto as well as the sentiment prevalent in everyone's mind,

BE IT RESOLVED, that the Louisiana Engineering Society extend to the Board of Commissioners of the Port of New Orleans and to Mr. Lockenberg, its deepest gratitude and sincere appreciation for this privilege;

BE IT FURTHER RESOLVED, that this resolution be incorporated in the minutes of the Society and that a copy be sent to the said Board. * * * * *

WHEREAS, the Engineers' Club of New Orleans has so generously offered the use of its facilities in this fine spirit of cooperation with the Woman's Auxiliary and the Louisiana Engineering Society for tonight's meeting,

BE IT RESOLVED, that the Louisiana Engineering Society extend to the Engineers' Club of New Orleans its most sincere thanks and appreciation for this courtesy and privilege, and

BE IT FURTHER RESOLVED, that this resolution be incorporated in the minutes of the Society and a copy sent to Mr. D. W. Stewart, President of the Engineers' Club of New Orleans. * * * * *

New Members. The following members were elected on the December ballot. We welcome them into the Society, and trust that they will take an active part in the affairs of the organization.

For Member

- CLIFTON J. ARNOLD**, New Orleans; age 27. Endorsed: S. J. Campagna, S. D. Louchis, G. B. S. Ricketts. La. State University, B.S.E.E. 1949. Best Electric Co., Sales Engineer, 1950. Keesler Air Force Base, Civilian Radar Electronic Instructor, 1950-51. Sperry Gyroscope Co., Asst. Production Engr., 1951-52. Kaiser Aluminum & Chemical Corp., Jr. Engr., October 1952-date.
- GROVER C. BAYLES**, New Orleans; age 42. Endorsed: Forney Fuller, A. J. Harris, M. E. Youngs. Polytechnic Institute of Brooklyn, N.Y., M.E. course, 1930-33. Newport News Shipbldg. & Dry Dock Co., Va., Machinery Draftsman, 1933-38. Philadelphia Navy Yard, Marine Engineer, 1938-45. Elliot Co., Jeannette, Pa., Asst. Engr., 1945-49; Application Engr., 1949-52; Field Engr., Atlanta, Ga., 1952-54; District Mgr., New Orleans, March 1954-date. Sales promotion of mechanical and electrical equipment for power plant and industry.
- LEONARD H. BOSSIER**, Alexandria; age 31. Endorsed: Oren Baker, C. C. Edwards, L. J. Lassalle. La. State University, B.S.M.E. 1950. Registered M.E., La. C & B Gravel Co., DeRidder, La., supervision of road and street construction, 1950-53. L. H. Bossier, Contractor, construction of road projects under contract for La. Dept. of Highways, 1953-date.
- JULIAN A. DARDEN**, Baton Rouge; age 29. Endorsed: T. L. Cappel, W. C. Gaddy, Randall Meyer. Virginia Polytechnic Inst., B.S.E.E. Dec. 1947. Member Tau Beta Pi, Eta Kappa Nu. Esso Standard Oil Co., Electrical Engr., Mtec. and Construction Engr., 1948-date.
- JAY M. JALENAK**, New Orleans; age 26. Endorsed: F. L. Alcus, Irwin Isaacson, T. F. Ruffin, L. J. Lassalle. La. State University, B.S.M.E., 1947. Southern Law University (part-time) 1948-54, LLB, Aug. 1954. Registered M.E., La. Air Temperature, Inc., Memphis, Asst. Chief Engr., design, sales, supervision of installation, heating, air-conditioning, ventilating equipment, 1948-54. U. S. Army Corps of Engrs., 388th Engineering Pipeline Co., 1951-53. Jay M. Jalenak Engineering Co., air-cond., heating contractor, Sept. 1954-date.
- LESLIE M. JOHNSON**, Baton Rouge; age 37. Endorsed: W. C. Gaddy, Jr., F. A. Hannaman, Jr., C. H. Hall. Stevens Institute of Technology, M.E., 1949. Brooklyn Union Gas Co., N.Y., Asst. Storekeeper, layout of 2 new warehouses, establishment of modern material handling operations, 1949-51. Chrysler Tank Engine Div., New Orleans, Material Supervisor, 1951-53. Esso Standard Oil Co., Engineer, M.E. Dept., Nov. 1953-date.
- JAMES A. O'NEILL, JR.**, New Orleans; age 30. Endorsed: R. E. Gosa, C. B. Whyte, M. E. Youngs. University of Texas, B.S., Ch.E., Feb. 1949. Universal Oil Products Co., Riverside, Ill., Chemical Engineer, 1949-53. Ingram Oil & Refining Co., Meraux, La., Asst. Supt. of Meraux Refinery, Jan. 1953-date.
- EDWARD K. RICHARDSON**, New Orleans; age 40. Endorsed: B. H. Bell, G. H. Kellerman, W. S. Leake. University of Florida, B.S.E.E. Feb. 1935. Member Florida Eng. Society. Tampa Armature Works, 1935-37 and 1946-53. Engineer, Sales Engineer, Sales Mgr. Allis-Chalmers Mfg. Co., graduate training course, 1937-1938; Sales Engr., Baltimore, Md., 1940-41. Florida Power Corp., Turbine and switchboard operator, 1939-40. U.S. Air Force, airborne radar officer, Major, USAF Reserve, 1941-46. New Orleans Armature Works, Sales and Engineering, 1953-date.
- DANIEL D. SANDEFUR**, Alexandria; age 42. Endorsed: C. W. Cook, T. C. David, C. R. Westerchil. La. State University, B.S.C.E. 1953. Associate Member ASCE, Member Tau Beta Pi, Sigma Tau Sigma. Registered C.E., La. La. Hwy. Commission, Rodman, Instrumentman, 1929-32. Flynn Mfg. Corp., Draftsman, Parts man, 1932-37. Various employers, Draftsman and Construction Supt. on FHA homes and small commercial bldgs.; Ordinary seaman, Able seaman with Mississippi Shipping Co., 1937-41. U. S. Naval Reserve, active duty, 1941-45. City of Alexandria, Chief Draftsman, 1945-49. La. College and L.S.U., 1949-53. E. I. duPont deNemours, Area Engineer, Industrial Construction, Florida & West Va., 1953-54. City of Alexandria, Asst. City Engineer, June 1954-date.
- ELBERT H. SANGWINE**, New Orleans; age 39. Endorsed: C. E. Cassagne, Jr., J. E. Rebold, G. B. S. Ricketts. Saskatchewan University, Canada, B.S.Ch.E., 1933-38. Member Engineering Society of Canada, Chemical Institute of Canada. Alcan, Engineer, Supervisor Research and Development, Supt. Reduction Operations, Project Engr. in design of smelter equipment for Kitimat Aluminum Plant, 1938-52. Kaiser Aluminum & Chemical Corp., Reduction Plant Manager, 1954.
- ARCH LEE WALLACE**, New Orleans; age 46. Endorsed: H. M. Blain, J. S. Janssen, J. P. Fernandez. La. State University, B.E.E. 1930. N. O. Public Service Inc., Pressure Control Engineer in charge Pressure Control Section of Gas Dept., 1931-date.

For Transfer From Junior To Full Member

- ROBERT W. AMMON, Baton Rouge; age 32. Purdue University, B.S.M.E. 1948. Esso Standard Oil Co., Baton Rouge Refinery, Project Engr., Dept. Head, Asst. General Foreman, 1948 to date.
- CHARLES BITTENBRING III, New Orleans; age 34. Tulane University, B.E. in C.E., 1940. Registered C.E., Ga., La. Humble Oil & Refining Co., Jr. Engr., 1940-41. Bd. of Commissioners, Port of N. O., Draftsman, 1941-42. U. S. Navy, CEC Corps, Ensign to Lt., 1942-46. Smith-Bittenbring, Inc., Contracting and Engineering, partner, 1946-51. U. S. Navy, Lt. Cmdr. CEC, Design and Construction Officer, 8th N/D District Public Works Office, 1951-date.
- GLENNY P. BLANCHARD, Baton Rouge; age 30. La. State University, B.S.M.E. 1948. Stone & Webster Eng. Corp., Jr. Engr., 1948-49. C-B Construction Co., Inc., Estimator, Engineer, 1949-date.
- JULIUS W. COLE, Baton Rouge; age 27. La. State University, B.S.C.E. 1949; graduate work toward M.S.C.E., 1 yr. Registered C.E., La. La. Dept. of Hwys., bridge design, 1 yr. U. S. Army Corps of Engrs., 2 yrs. Winkler Mfg. Co., part owner and engineer, 1 yr.
- ALFRED N. GORDON, Baton Rouge; age 28. Massachusetts Inst. of Technology, S.B. Mech. Eng., 1949. Registered M.E., La. Esso Standard Oil Co., Baton Rouge, summer 1948 and Aug. 1949 to date, Engineer, Mechanical Eng. Dept.
- CHRISTOPHER H. HALL, Baton Rouge; age 34. Virginia Polytechnic Institute, B.S.M.E., 1949. Registered M.E., La. La. Esso Standard Oil Co., Project Engr., Mechanical Tech. service Engr., Aug. 1949-date.
- ALLEN S. JACKSON, Baton Rouge; age 30. La. State University, B.S.E.E. Registered E.E. and Land Surveyor, La. La. Dept. of Highways, Sr. Electrical Engineer, 6 yrs.
- F. PRESTON MOTTRAM, New Orleans; age 28. Tulane University, B.E. in M.E., 1946. Registered M.E., La. Audubon Sugar Factory, LSU, Research Asst., 1946. Todd Johnson Dry Docks, Inc., Technical Supervisor, 1947-48. Swift & Co., Plant Food Div., Plant Engr., 1948-51. Red Star Yeast Products Co., Plant Engineer, 1951-date.
- FRANCIS J. WARREN, JR., New Orleans; age 28. La. State University, B.S.E.E. 1948. Registered E.E., La. Gulf States Utilities Co., Baton Rouge, Industrial Engineer, 1948-53. U. S. Navy, CEC, Lt. (j.g.) 1953-date.
- TROY L. WILSON, JR., Baton Rouge; age 30. Tulane University, B.S.C.E. 1944. Registered C.E., La. Esso Standard Oil Co., Project Engr., Coordination Engr., Mtce. and Construction Engr., Industrial Engr., 1946-date. U. S. Navy, overseas base construction, 1944-45.
- GEORGE L. YOUSKO, Baton Rouge; age 33. Ohio State University, B.M.E. La. State University, M.S. Esso Standard Oil Co., Project Engr., Mtce. and Construction Planning Engr., Estimating Engr., 7½ yrs.

For Junior Member

- WILLIAM O. CRABTREE, Baton Rouge; age 26. Endorsed: R. W. Ammon, F. A. Hannaman, Jr., Randall Meyer. North Carolina State College, B.C.E. 1952. Jr. Mbr. ASCE, 1952. Esso Standard Oil Co., Project Engr., M.E. Dept., June-July 1952. U. S. Army, Corps of Engrs., Eng. Staff Officer, 1952-54. Esso Standard Oil Co., Project Engr., M.E. Dept., June 1954-date.
- JOHN L. PFEFFER, New Orleans; age 24. Endorsed: J. K. Hess, G. F. Stevenson, F. W. zurBurg. Southwestern La. Institute, B.S.C.E. 1950. Loyola University, 1 semester Bacteriology, 1950. Tulane University, organic chemistry, 1 yr., 1952-53. Registered C.E., La. La. Dept. of Hwys., Party Chief, June-Oct. 1950. U. S. Army Corps of Engrs., C.E., Post Engineer Div., N. O. Port of Embarkation. Project Engr. on various construction and mtce. projects; designing, preparing plans and specification and inspecting work of contractors, 1950-date.
- JACK W. WHITE, JR., Baton Rouge; age 27. Endorsed: A. N. Gordon, C. H. Hall, F. A. Hannaman, Jr., University of Florida, Industrial Engineering, B.I.E., Feb. 1952. Humble Oil & Refining Co., Jr. Petroleum Engr., 1952-53. Esso Standard Oil Co., Mechanical Engineer, Aug. 1953 to date.
- CARL B. WHYTE, JR., New Orleans; age 26. Endorsed: R. E. Gosa, M. E. Youngs, C. B. Whyte. Texas A & M College, Mechanical Engineering, 1945-49. Student Member ASME, 1944-45. Graver Tank & Mfg. Co., Research Engineer, 1949-50; Field checking of installations, 1950-51. Marshall Field & Co., Staff Industrial Engineer, 1951-53. Ingram Oil & Refining Co., Meraux, La., Chief Engineer, foundation design, structural work, 1953 to date.

ENGINEERING BRIEFS

New Device Prevents Humidity From Interrupting Television and Radio Programs. Interruption of television and radio programs due to objectionable humidity in transmission lines is now prevented by a new device—a manual reset humidity alarm control.

The new control was originally designed for use in all kinds of communication transmission lines where dry air, supplied by any means, is relied upon to maintain satisfactory, high-quality insulation or dielectric properties. For about one year, it has been used by television, telephone, and radio engineers for continuously monitoring the dry air supply that is fed into underground coaxial cables, transmission ducts, and other electrical conductors.

If the air supply to these transmission systems should fail, or if the humidity of the air supply should rise for any reason, the controller of the new alarm immediately senses the increasing humidity, whereupon a red light will appear on a panel or an alarm bell will ring to give warning of impending failure and resultant automatic disconnection of the transmission line.

By determining the proper humidity value of the air supply to the transmission lines and setting the controls of the new device accordingly, the visual or audible warnings will permit corrective action before humidity rises to a point that would cause interruption of programs. After corrective measures have been taken, the warning system is turned off by pushing a manual reset button, whereupon the air-dryness monitor resumes operation.

The new device makes it impossible for the alarm to be turned off by momentary conditions of low humidity. Until dry air is again available or the electric power is intentionally disconnected, the alarm will continue to function.

The alarm system contains a one-inch pipe-threaded mounting for a humidity sensing element, connecting cables, meter indicator, internal contacts for turning off the warning light or audible alarm, a manual-reset button, and cable for connecting to the power supply.

The new device is one of the latest additions to the line of electric hygrometer devices developed and manufactured by the American Instrument Co., Inc., Silver Spring, Md., from whom details may be obtained.

—*Aminco Laboratory News.*

* * *

Industrial Waste Disposal Program Inaugurated by Case Institute. Case Institute of Technology is undertaking a research program on industrial waste disposal in the Cleveland area. This program has been endorsed by the Committee on Industrial Wastes of the Cleveland Chamber of Commerce and the Ohio Department of Health.

Directing this carefully planned study will be Prof. George E. Barnes, assisted by Dr. Leon W. Weinberger.

According to Prof. Barnes, the focal point of the project will be to crystallize the city's and industry's thinking on what the objectives should be in the area. Case's facilities and previous studies in this field place it in an excellent position to aid in the development of objectives, definitions, and methods.

In outlining the program Prof. Barnes said it will be primarily concerned with the pollution potential of industrial wastes in metropolitan Cleveland and the status of industrial waste disposal in this area. Later phases will take up studies on the effect of various wastes on unit processes, such as sedimentation, aeration, and sludge digestion.

—*Aminco Laboratory News.*

* * *

Element 100 Produced. Swedish scientists have manufactured the heaviest element in the universe, No. 100, it was learned recently. This is believed to be the first time that scientists outside the United States have succeeded in making an element heavier than uranium, No. 92, which is the heaviest occurring naturally.

Announcement of the discovery of element 100 by a University of California group led by Nobelist Glenn T. Seaborg was made in February 1954, but the date of their work was not given.

The Swedish scientists made an isotope of element 100 by bombarding uranium with charged oxygen particles in a cyclotron. The isotope has a half life of about half an hour according to Drs. Hugo Atterling, Wilhelm Forsling, Lennart W. Holm, Lars Melander, and Bjorn Astrom of the Nobel Institute of Physics, Stockholm, Sweden.

The Swedish scientists made the element 100 with oxygen ions having energies of 180,000,000 electron volts. The uranium was forced to take on, in one step, the eight protons necessary to change it into the new element.

—*Aminco Laboratory News.*

* * *

Goodbye, Old Paint. New types of paint are available for almost any surface, from stucco walls to washing machines. Development of improved coatings has paralleled the introduction of plastics raw materials; as these new resins have been introduced they have been adopted for use in paints. In 1953, 25 per cent of total synthetic resin production was used in coatings.

Important types of coating materials are alkyds; phenol-, melamine-, and urea-formaldehyde resins; and polyvinyl resins. Chemical cellulose—a basic raw material for rayon, acetate, cellophane, and photographic film—is used in large quantities in the manu-

facture of synthetic lacquer, Styrene, most familiar to consumers in brightly colored household and novelty products, is used in large quantities in the popular latex paints and in smaller proportions in other new types.

The water-thinned latex paints were introduced in 1949, and grew to seven per cent of total paint sales by 1953, largely because of the ease of application, lack of odor, and facility in cleaning equipment. Most of the latex paints now available are limited to interior use, but exterior paint formulations are under development. Some types have already proved satisfactory for exterior use in the southwest and far west, where only light rainfall and a limited temperature range are encountered. Elsewhere, climatic conditions and the preference for wood construction limit the market; water-thinned paint raises the grain of some woods and may streak if the wood itself contains water extractable materials. Non-flammable water-thinned enamels for use on such industrial products as automobiles, furniture, machinery, and toys are now available, but with industrial products made of steel problems of corrosion and satisfactory wetting of oily surfaces are encountered. A fully satisfactory non-flammable substitute for the versatile and economical oil-based enamels and lacquers now used as industrial finishes remains to be developed.

Sparked by the success of the water-based latex paints, use of odorless solvents in oil— and alkyd-based paints has grown substantially. Alkyd paints, with odorless solvents, have had great success, especially for interior applications. In 1953, about seven million gallons of the "odorless" solvents were used in interior paints; growth to some 20 million gallons per year is expected within five years. Additional large quantities are used for household dry-cleaning solutions. Actually these solvents, by-products of aviation gasoline manufacture, are not completely odorless, but the irritating effects of older types of solvent vapors are virtually eliminated.

"Polka-dot paint" is a new specialty lacquer in which fine droplets of different colored lacquers are suspended in an aqueous medium. The color used in the largest quantity appears as the background when the lacquer is sprayed, while the other colors appear as dots in relief on the surface. The product is expected to find its most important outlet in furniture finishes. Another potential market is in development housing, to provide an unusual decorative effect for interior walls.

Epoxy Coatings

Epoxy resins, used in adhesives and laminating compounds, find their biggest application in coatings. The first U. S. plant went into production in 1947; output in 1953 was about 10 million pounds, of which approximately eight million went into industrial coatings.

Epoxy paints have excellent adhesion, flexibility, and resistance to attack by water and chemicals. Perhaps the largest application is for undercoatings for washing machine tubs, previously porcelain coated, to provide resistance to the alkali in soap. Another big market is in metal can linings.

Because of their high cost, around 60 cents a pound, epoxies are generally restricted to specialty applications. One, for example, is in packaging products like tomato paste in collapsible aluminum tubes; the coating film does not crack, hence the acid does not attack the metal when the tube is rolled up. Epoxy-based paints are also used to line black-plate steel drums, replacing stainless steel. New applications may double the market for epoxy coatings in the next five to ten years.

—*Consulting Industrial Research, Arthur D. Little, Inc.*

—*Industrial Bulletin of Arthur D. Little, Inc.*

* * *

Synthetic Mica. Without mica, the electrical industry would be severely handicapped, yet the United States depends upon imports—chiefly from India, Brazil, and Canada—for over 90 per cent of the 15 million pounds used here annually for vacuum tubes, condensers, capacitors, and other electrical equipment. Actually the United States produces the world's greatest tonnage of mica, but most of this is mined indiscriminately and ground to small crystals. These are then used in fire-resistant paints, roofing materials, and heat insulation. Synthetic mica, in the early stages of commercial development, is superior to natural mica in some respects. Since it is still relatively expensive, it will probably be limited to specialty applications, and will have little effect on the volume of mica imported.

Natural block mica can be split into extremely thin and flexible sheets, but this must be done by hand. The United States imports 97 per cent of its mica splittings from India, where labor costs are low and the mica supply plentiful. Some companies take native U. S. "junk" mica, and mechanically separate it into thin, but tiny, flakes. These flakes can then be "reconstituted" into thin usable sheets of commercial size, but limited in application by their weak mechanical strength. When synthetic mica is made in sheet form, the strength is superior to reconstituted natural mica. Ceramic mica is crystalline mica bonded by sintering techniques similar to those of powder metallurgy into large, strong forms. For this type of product also, synthetic mica is often superior to the natural product.

During World War II the Germans and Japanese, without sheet mica, worked on synthetic; the Germans claimed to have synthesized crystals as large as four inches square. In 1946 and '47, the German line of experimentation was carried on in this country, and in 1948 three other projects were set up. In one project, sponsored jointly by the U. S. Bureau of Mines, the Office of Naval Research and the Army Signal Corps, over a hundred different types of mica were synthesized, but only three showed practical promise for the immediate future. One of these, the type called fluorophlogopite, in which fluorine replaces one constituent of natural mica, is superior to the natural product in its thermal resistance and chemical purity. A ton of raw materials costs about \$200, and all the ingredients are readily available in the United States.

Synthetic mica is being produced by two processes. In one, mica crystals are formed when a batch of raw materials is fused by direct electrical resistance heating to 2370° F., and carefully cooled. Mica flakes may be obtained from these crystals and used to make reconstituted sheets with better mechanical strength than those from natural mica. When the flakes are sufficiently large, they may be used for vacuum-tube spacers. With further refinement of this process, it may ultimately be possible to synthesize large crystals for use in all those applications where natural mica is considered critical, and which take some two thousand tons of mica annually. The company that has taken over this process expects eventually to have a capacity of a thousand tons per year, but while the process is relatively economical, the cost of hand splitting remains too high for it to compete with imports from India.

Hot-pressed Synthetic

In the second process, an intimate mixture of the raw materials is reacted in the solid state at temperatures in the range between 1830° F. and 2190° F. The product is tiny crystals of synthetic mica that are now being hot-pressed and machined to close tolerances to give strong, weather-resistant shapes with excellent electrical properties; they have been substituted for both steatite and block talc as electrical insulators. This type of synthetic mica may be incorporated with powdered metal to produce machinable electrical insulators; matrix material for grinding wheels; brazing jigs, and other specialized parts; or with abrasives and solid lubricants, such as graphite and boron nitride, to make special heat-resistant parts.

—*Industrial Bulletin of Arthur D. Little, Inc.*

MINUTES OF THE MEETINGS AND BUSINESS OF THE SOCIETY

Minutes of Meeting of the Board of Direction held November 1, 1954

The meeting was called to order by President Macdonald with Messrs. Abrahm, Freeman, Kelly, McLellan, Nelson, Wallace and Fernandez present. Messrs. Robert H. Grehan, B. M. Dornblatt, Calvin T. Watts and Henry Howard also were present by invitation.

Mr. Kelly moved that minutes of the preceding meeting be accepted as read, seconded by Mr. Abrahm and carried.

The secretary read abstracts from minutes of meeting of the Louisiana Council of Engineers held on October 12 and President Macdonald stated that the Council's action had been recommended by the Legislative Committee of which Mr. Watts was Chairman. Mr. Watts then explained the recommendations for the committee.

Mr. Dornblatt, Chairman of the Committee on Honors and Awards, announced that his committee was divided in its choice of a recipient for the Civic Activities Medal and that no nominee had received a majority vote. After much discussion and the presentation and withdrawal of a motion, Mr. Dornblatt agreed to have his committee reconsider and vote again on this matter, eliminating those who had received fewest votes. He advised that his report would be submitted on Monday, November 15, whereupon Mr. Seago moved that a special meeting of the Board of Direction be held on Tuesday, November 16. Motion seconded by Mr. Freeman and carried.

A letter from Mrs. L. V. Cressy expressing thanks for the obituary of her late husband was read.

A letter from Mr. R. H. Meier, Electrical Engineer of Michigan, asking for employment in this area was read. The secretary was instructed to forward same to the employment Committee.

A draft of the certificate to be presented to former presidents of the society was presented and the secretary reported prices for the various types of certificate that had been suggested, after which he was instructed to have the certificates ready for presentation at the next regular meeting of the society.

Upon the recommendation of the board, President Macdonald appointed Mr. Waldemar Nelson to act as Master of Ceremonies for "Presidents' Night".

President Macdonald reported that the Honorary Membership Committee, of which he is chairman, had voted by secret ballot upon a petition for honorary membership. Of the votes cast, more than 90% were in favor of granting the petition. However, the percentage of favorable votes received to ballots sent was slightly less than 80%. Section 2, Article 7 of the constitution was read carefully and it was decided that the constitutional requirement is 80% of the entire committee, those not voting to be considered as having cast negative votes. After this interpretation of the constitution it was decided that action on the honorary membership petition be postponed until the special meeting on November 16.

Review of the proposed constitution for the Louisiana Council of Engineers was postponed until the special meeting; however, the secretary read a letter from the Shreveport Section in which they inquired whether the Louisiana Council of Engineers would be a state-wide organization or should a single council be formed in Shreveport.

President Macdonald announced that the secretary's work has greatly increased during the last few years and if possible he should be adequately compensated. With the concurrence of the board, he appointed a committee consisting of Messrs. Seago, Wallace and himself to make recommendations to the board.

The meeting then adjourned so that the society's regular meeting could begin on time.

JOHN P. FERNANDEZ, Secretary-Treasurer

**Minutes of Regular Meeting of the Louisiana Engineering Society held Jointly
With the New Orleans Section, AIEE on November 1, 1954 in the
Jackson Room, St. Charles Hotel**

The meeting was called to order by Vice-President Seago, who welcomed members and guests of A.I.E.E. Approximately 120 were in attendance.

Reading of minutes of the preceding meeting was dispensed with, and the secretary then read minutes of a meeting of the Board of Direction held in October.

Mr. Oliver H. Schulingcamp, Vice-Chairman, Speakers Bureau of the Greater New Orleans Educational Television Foundation, gave a short talk in behalf of that organization, after which Mr. Seago announced that the nominating Committee for 1955 officers would receive suggestions for ten days following this meeting and urged members to send in their nominees' names.

The chair then was relinquished to Mr. Herbert C. Swan, Chairman, AIEE, who called on a member of his organization to introduce the principal speaker of the evening, Mr. Joseph Dechovitz, Toll Transmission Engineer, Southern Bell Tel. & Tel. Co., Atlanta, who gave a most informative talk on 'The Transistor—Its Nature and Applications'. After a lively question period the chair was returned to Mr. Seago who adjourned the meeting with a rising vote of thanks to the speaker.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Board of Direction Held on November 16, 1954

The meeting was called to order by President Macdonald with Messrs. Freeman, McLellan, Nelson, Seago, Wallace and Fernandez present. Messrs. Robert H. Grehan, Assistant Secretary, and Calvin T. Watts, Chairman, Legislative Committee, also were present. Mr. McLellan moved that minutes of the preceding meeting be accepted as read; motion seconded by Mr. Freeman and carried.

President Macdonald, as Chairman of the Honorary Membership Committee, reported that 82% of the ballots mailed were cast in favor of awarding honorary membership to Mr. Norman E. Lant, whereupon the board members present voted unanimously to make this award.

A report of the Committee on Honors and Awards, headed by Mr. B. M. Dornblatt, was read. Therein it was recommended that no award of either the A. M. Locket Civic Activities Medal or the Technological Accomplishment Medal be made this year. Mr. McLellan moved that the committee's report be accepted and its recommendation followed, seconded by Mr. Nelson and carried, with Mr. Freeman abstaining from vote.

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Mr. Wallace then moved that, in view of the fact that no medal awards will be made during the 1955 annual meeting, the presentation of honorary membership be scheduled for the General Interest Meeting on Thursday, January 13. Motion seconded by Mr. McLellan and carried.

Mr. McLellan, Chairman of a committee appointed to select a recipient for the society's annual Certificate of Appreciation for outstanding service rendered during the year, reported that his committee had considered many deserving members and finally decided to recommend Mr. Calvin Watts to be honored for his service as Chairman of the Legislative Committee and particularly for his excellent handling of House Bill No. 1113. Mr. McLellan then moved that Mr. Watts receive the Certificate of Appreciation, seconded by Mr. Freeman and carried.

Mr. Seago moved that, since no medals be awarded this year, the Certificate of Appreciation be presented to Mr. Watts at the Thursday Night General Interest Program on January 13. Motion seconded by Mr. Nelson and carried. It was then recommended that Mr. Roy Sessums be asked to make the presentation.

The report of the Nominating Committee then was read, in which the following slate of nominees for the December election of officers was submitted:

For President	R. Mallard Seago
For First Vice-Pres.	Wayne P. Wallace
For Second Vice-Pres.	Waldemar S. Nelson
For Secretary-Treas.	John P. Fernandez
For Directors	Wm. J. Drawe, Jr., Francis M. Taylor

As Chairman of a Special Finance Committee consisting of Messrs. Seago, Wallace and himself, President Macdonald submitted a proposed budget for 1955 showing an increase in the secretary-treasurer's salary of \$50.00 per month. Mr. Seago then moved that, in view of the fact that the present board was not empowered to approve expenditure for 1955, the secretary's salary be increased to \$250.00 per month effective December 1, 1954. Motion seconded by Mr. Freeman and carried.

A letter from Mr. Oliver P. Schulingcamp, thanking the society for permitting him to address its November meeting in behalf of Educational Television, was read.

Mr. Nelson moved that Richard L. Johnson, Jr., be reinstated to Junior membership in the society, seconded by Mr. Seago and carried.

Letters from Messrs. M. C. Abrahm and Carl M. Hadra concerning the proposed constitution for the Louisiana Council of Engineers were read. After much discussion of the subject Mr. Nelson moved that, since the extent of participation by the L. E. S. in the Louisiana Council of Engineers is involved in an overall study of finances and possible reorganization of the society now being made, it is therefore deemed advisable to defer action on the proposed constitution of the Council until such study is further developed. Motion seconded by Mr. Wallace and carried.

In accordance with the constitution, Mr. McLellan moved that Mr. Albert H. Wehe, Jr., be dropped for non-payment of dues, seconded by Mr. Seago and carried.



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Upon the recommendation of the board, President Macdonald appointed Messrs. James S. Janssen and Mario G. Zervigon to prepare an obituary in honor of the late George J. Richaud.

Mr. Nelson moved that the ladies be invited to attend the December meeting of the society, seconded by Mr. McLellan and carried. After some discussion of the activities of the Committee on Reorganization of the Society headed by Mr. Clayton L. Nairne, and announcement that it would meet in Baton Rouge at an early date, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

**Minutes of Meeting of the Louisiana Engineering Society Held on Monday,
December 6, 1954, In the Jackson Room, St. Charles Hotel**

The meeting was called to order by President Macdonald with approximately 100 in attendance. The president welcomed members and guests. Mr. Freeman moved that the reading of minutes of the preceding meeting be dispensed with, seconded by Mr. McLellan and carried. On account of the length of the program, President Macdonald suggested that reading of minutes of the November board meetings be dispensed with. Accordingly, motion was made by Mr. Williamson, seconded by Mr. Freeman and carried.

The president announced that the annual meetings of the Baton Rouge and Shreveport Sections would be held in December and invited the membership to attend.

Mr. Abraham, Chairman of the Nominating Committee, announced that his committee had met in accordance with the constitution and submitted the following slate of nominees for the forthcoming election of officers for 1955:

For President	R. Mallard Seago
For First Vice-President	Wayne P. Wallace
Second Vice-President	Waldemar S. Nelson
For Secretary-Treasurer	John P. Fernandez
For Director for 2 Years	Francis M. Taylor
For Director for 2 Years	Wm. J. Drawe, Jr.

Mr. Abraham then moved that the recommendations of his committee be accepted and placed on the ballot. Motion seconded by Mr. Freeman and carried. President Macdonald then announced that nominations from the floor were in order. There being none forthcoming, Mr. Todd moved that the nominations be closed. The motion was duly seconded and carried.

Mr. Waldemar S. Nelson then made the presentation of certificates of appreciation to former presidents of the society, after which a moment of silence was observed in memory of all departed leaders of the organization. Mr. Todd, speaking for the presidents, expressed their thanks and assured the membership that serving the society was sufficient gratification in itself without further recognition.

President Macdonald then introduced Mrs. Mario Zervigon, President of the Woman's Auxiliary to the Louisiana Engineering Society, who was in attendance.

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An obituary in memory of the late George J. Richaud was read by Mr. Mario Zervigon, following which a moment of silence was observed. Mr. Zervigon then moved that the obituary be spread upon the minutes of the society, published in the Proceedings and copies sent to the surviving family of the deceased member. The motion was seconded by Mr. James Janssen and carried.

Mr. John S. Burke then introduced Mr. Joseph Leininger, Consulting Engineer of New Orleans, who in turn introduced a panel of speakers who gave a most interesting discussion on the multiple phases of "Home Air Conditioning". Following this, President Macdonald thanked the speakers and the meeting adjourned with a rising vote of thanks.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Annual Meeting, Thursday, January 13, 1955

The meeting was called to order by President Macdonald in the Claiborne Room, St. Charles Hotel with approximately 80 members and guests present. Rabbi Leo A. Bergman of Touro Synagogue gave the invocation.

Mr. A. W. Durning moved that the reading of minutes of the preceding meeting be dispensed with. The motion was duly seconded and carried. Mr. Billingsley moved that the reading of board meeting minutes be dispensed with, seconded by Mr. Todd and carried.

President Macdonald then introduced the presidents of state sections who were in attendance, after which he introduced President R. L. Ropp of Louisiana Polytechnic Institute, who delivered the key-note address, entitled "The Engineer Looks Ahead". Following the lecture, Mr. Macdonald thanked Mr. Ropp and the audience gave him a rising vote of appreciation.

The secretary-treasurer presented his annual report, copy of which is attached to these minutes.

President Macdonald then delivered his annual report, giving the highlights of his administration.

Dr. W. P. Wallace then introduced certain resolutions, copies of which are attached to these minutes, and moved that they be accepted. The motion was seconded by Mr. Todd and carried.

The president then awarded certificates of merit and prizes to the following speakers at the student conference:

Carroll L. Oubre, Southwestern Louisiana Institute—"The Metal Titanium".
William H. McCasland, La. Polytechnic Institute—"Mat Foundations."
J. M. Daigle, La. State University—"Motion and Time Study."
Charles G. Battig, Tulane University—"The Color Television System."

The president presented certificates of life membership to the following who have completed 30 years of active membership in the society:

A. Lee Dunlap, David W. Godat, Allan J. Harris, Robert J. Kuhn, Hampton Reynolds, Reinhard A. Steinmayer, A. R. Wingate, Jr.

Mr. M. C. Abrahm, Chairman of the Nominating Committee, then announced that 343 ballots had been cast and that, in addition to the newly elected officers who would be introduced, the Board of Direction for 1955 would include the following state section presidents:

Mr. C. C. Edwards, Jr., President, Alexandria Section.
Mr. Wiley D. Poole, President, Baton Rouge Section.
Mr. Charles J. Russell, President, Lafayette Section.

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Mr. Charles R. McBride, President, Lake Charles Section.

Mr. Alvin P. Andrews, President, Monroe Section.

Mr. Osborn J. Dykes, Jr., President, Shreveport Section.

Mr. Abraham then requested the following gentlemen to escort the respective officers and board members to the rostrum:

Mr. William H. Rhodes, escorting Mr. E. M. Freeman, incumbent board member.

Mr. Lionel J. Cucullu, escorting Mr. E. A. McLellan, incumbent board member.

Mr. A. Lee Dunlap, escorting Mr. Wm. J. Drawe, Jr., newly elected board member.

Mr. Charles S. Williamson, Jr., escorting Dr. F. M. Taylor, newly elected board member.

Mr. Reinhard A. Stemmayer, escorting Mr. John P. Fernandez, Secretary-Treasurer.

Mr. James M. Todd, escorting Mr. Waldemar S. Nelson, Second Vice-President.

Dr. Leo J. Lassalle, escorting Dr. Wayne P. Wallace, First Vice-President.

Mr. David W. Stewart, escorting Mr. R. Mallard Seago, President.

Retiring President Macdonald then handed the gavel to President-Elect Seago, who accepted the office with a brief message of appreciation and asked the membership to continue the excellent work that has been done in the past.

Mr. A. W. Durning, General Chairman of the 1955 Annual Meeting, then presented retiring President Macdonald with a gift of a token of appreciation for his outstanding leadership while in office.

After announcement of the remainder of the program the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

**Minutes of Annual Meeting of the Board of Direction with State Section
Officers Held on Friday, January 14, 1955 at Arnaud's Restaurant**

The meeting was called to order by President Seago with Messrs. Abraham, Andrews, Barron, Burgess, Drawe, Durning, Dykes, Freeman, Fernandez, Hadra, Innes, Kelly, Knight, Knost, Macdonald, McLellan, Nairne, Nelson, Poole, Russell, Taylor and Wallace present. The president asked each to introduce himself, and then announced that the object of the meeting was to obtain closer working cooperation among all members throughout the state. In order to refresh the memories of those present on what transpired at the meeting last year, he called on the secretary to read minutes of the 1954 meeting.

President Seago then announced that there present the chairmen of several committees whose activities affected every section of the society. He then called on Mr. Clayton Nairne, Chairman of the Reorganization Committee, who outlined three plans studied by his committee:

(1) To continue the society's present plan of operation, with the exception that dues be increased to provide funds for greater rebates to sections and for the development of worthwhile engineering activities.

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(2) To revise the constitution so that New Orleans would become a local section and a state-wide governing board, consisting of a president, a vice-president, a treasurer and a full-time paid executive secretary, be elected by the membership. Said board would also include directors from local sections, varying in number according to total section membership.

(3) A compromise of Plans 1 and 2, whereby New Orleans would become a section and there would be a state-wide board of direction as outlined in Plan 2 with the omission of the full-time paid executive secretary. This board would meet semi-annually, and the work of the full-time executive secretary would be performed by the New Orleans secretary, who would be provided with clerical assistance.

Mr. Nairne stated that his committee had held its final meeting at noon of that day and had concluded it was not advisable to alter the society's present plan of operation at this time. The committee recommended, in order to provide additional funds for larger section rebates and for publicizing and developing engineering activities such as the Vocational Guidance JET program, that membership dues be increased to the following amounts:

New Orleans Members and Affiliates	\$12.00
State Members and Affiliates	10.00
Junior Members	5.00
Rebate to Sections — 50% of amount collected from section dues	

Mr. Dykes stated that the Shreveport Section recommended that the organization of the State offices within the New Orleans Section remain as at present, and that section membership dues be increased to \$10.00 and collected locally, one-half of the amount collected to be retained by the local section.

Mr. Innes stated that he believed himself to be responsible for the formation of the Reorganization Committee, and knowing the committee's personnel and the work it has done, he felt that the right answer had been reached, although he is of the opinion that eventually his suggestion to separate the state-wide organization from the New Orleans Section would be carried out. He expressed his appreciation to the committee for its splendid work.

Mr. Barron stated that the present organization has worked satisfactorily, although he felt that a parent organization should be state-wide; however, this angle could be improved by having the officers visit the sections and attend their meetings. Discussion followed on the financial difficulties encountered by sections and it was disclosed that only two sections levied local dues. Mr. Andrews stated that the Monroe Section assesses local dues of \$2.00 per year and by comparison with other sections has little financial difficulty, though no charges are made for food and refreshments at meetings. He added, however, that additional funds would be most welcome.

Mr. Seago presented a schedule of average rebates per member under the present set-up and the amount anticipated under the Reorganization Committee's recommended plan. Mr. Freeman moved that the board receive the committee's recommendation and take it under advisement for approximately 30 days until the next meeting. The motion was seconded by Mr. Nelson. Discussion followed whether there should be any delay in acting on the matter, and after several suggestions had been made, Mr. Macdonald made a substitute motion in which he moved that the recommendation of the Reorganization Committee be discussed at the March meeting of the Board of Direction in New Orleans, and that any board member who could not attend would be privileged to forward his vote by mail. The motion was seconded by Mr. Russell, and it was brought out during the discussion that most section presidents would wish to discuss the matter with their executive committees. The Motion then carried.

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Mr. Barron moved that Mr. Nairne be given a vote of thanks for the splendid work done by his committee, seconded by Mr. Wallace and carried.

Mr. William J. Drawe, Jr., Chairman of Engineers' Week Committee, reviewed the plans and the organization set up for the observance of Engineers' Week in New Orleans and urged the sections to follow a similar plan, announcing that chairmen had been appointed in each section and kits of material had been furnished them. President Seago then thanked Mr. Drawe for his report.

Mr. Andrews stated that a committee for Engineers' Week had been appointed at Monroe and that \$50.00 had been allotted for this program. Mr. Drawe then advised that the Monroe Section had done a wonderful job in 1954 and he was sure they would do equally well in 1955.

Mr. Freeman moved that Mr. Kelly be thanked for providing the refreshments at the Engineers' Club preceding dinner. The motion was promptly seconded and carried.

Mr. Knost, Chairman of the Vocational Guidance Committee, gave his report on the 1953-54 school year. His report was divided into sections, the most important undertaking during the year being the Junior Engineer Training Schedule known as JETS. He then called on Mr. J. T. Knight, Jr., Chairman of a sub-committee in charge of the JET program. Mr. Knight explained what the program is and advised that one Jet unit had been organized at De La Salle High School, another would be organized within thirty days at Fortier High, and a third within sixty days at Martin Behrman High. He stated that his committee was greatly in need of manpower in order to plan, organize and keep these JET units active. Mr. Knight's report was received with great interest.

Mr. Seago advised that, in order to carry on the society's business without interruption, certain motions were necessary. For instance, the Finance Committee should prepare the 1955 budget for presentation at the first meeting of the Board of Direction. He then requested a motion to appoint same, whereupon Mr. Russell moved that Messrs. W. P. Wallace, Chairman, J. P. Fernandez and F. W. Macdonald be appointed to this committee for 1955. Motion seconded by Mr. Dykes and carried.

Mr. Nelson moved that the president and the Secretary-Treasurer be authorized to sign checks. Motion second by Mr. McLellan and carried. Mr. Russell moved that the President or the Secretary-Treasurer have access to the safety deposit box. Motion seconded by Mr. Hadra and carried.

Mr. Freeman moved that Mr. R. A. Steinmayer be appointed to represent the society at the Chamber of Commerce, seconded by Mr. Poole and carried.

Mr. Abraham urged that the sections take active part in civic affairs of their localities to such an extent that all engineers would look to the Louisiana Engineering Society for leadership in professional matters in preference to any other organization.

Discussion followed concerning a constitution for the Louisiana Council of Engineers, during which Mr. Nelson pointed out that a motion had been passed at the last board meeting tabling action on the matter until the reorganization committee's recommendation had been acted upon.

Mr. Russell invited the society to hold an annual meeting at Lafayette, after which the meeting adjourned with a rising vote of thanks to Dr. Durning for the efficient and pleasing manner in which the annual meeting was progressing.

JOHN P. FERNANDEZ, Secretary-Treasurer

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Minutes of Meeting, Baton Rouge Section, Louisiana Engineering Society

Date, November 17, 1954; Time, 7:30 p. m.; Place, Esso Standard Oil Company-Employee Relations Assembly Room.

Officers present: T. J. Innes, President; Wiley D. Poole, 1st Vice-President, and Randall Meyer, Secretary and Treasurer.

Seventy-seven members and visitors were present as guests of Esso Standard Oil Company. President Innes conducted a short business session, and introduced Mr. D. O. Swan, Head of the Technical Division, Esso Standard Oil Company. Following a movie explaining modern refining processes Mr. Swan talked about Esso and the Baton Rouge Refinery and the significant role of engineers in the Company's operations. After a break for refreshments in the Company Main Cafeteria, all present were taken on guided bus tours of the refinery with stops at Nos. 9 and 10 pipe Stills and the Central Mechanical Building.

Adjournment at 10:30 p. m.

RANDALL MEYER, Secretary-Treasurer

Minutes of Meeting, Baton Rouge Section, Louisiana Engineering Society

Date, December 9, 1954; Time, 7:00 p. m.; Place, Mike and Tony's—Cypress Room.

Officers present: T. J. Innes, Jr., President; Wiley D. Poole, 1st Vice-President; F. G. Hornsby, 2nd Vice-President, and Randall Meyer, Secretary-Treasurer.

A total of 106 persons including members, their wives, and other guests met for the 16th annual meeting of the Baton Rouge Section. After a social hour and dinner, Mr. Innes opened the business session by introducing a number of special guests. Among these were state officers President Frank W. Macdonald, 1st Vice-President R. Mallard Seago, and 2nd Vice-President Wayne P. Wallace. Also, Mrs. Wiley Poole, President of the Baton Rouge Women's Auxiliary. After a brief resume of the year's activities by Mr. Innes, reports were heard from all officers and committees for 1954. Some of the highlights of these reports were the success of the 1954 program for visiting a number of Baton Rouge industries, the sizeable increase in membership of the Baton Rouge Section, the increased attendance at regular meetings, the active work of the Vocational Guidance Committee, revision of the By-Laws to bring them up-to-date and to provide for Members-At-Large on the Executive Committee, and the excellent publicity received for the year's activities.

The following slate of officers was nominated and unanimously elected for the coming year:

President—Wiley D. Poole.

1st Vice-President—F. G. Hornsby.

2nd Vice-President—Randall Meyer.

Secretary-Treasurer—Walter L. Sutton.

Member-At-Large to Serve on Executive Committee for

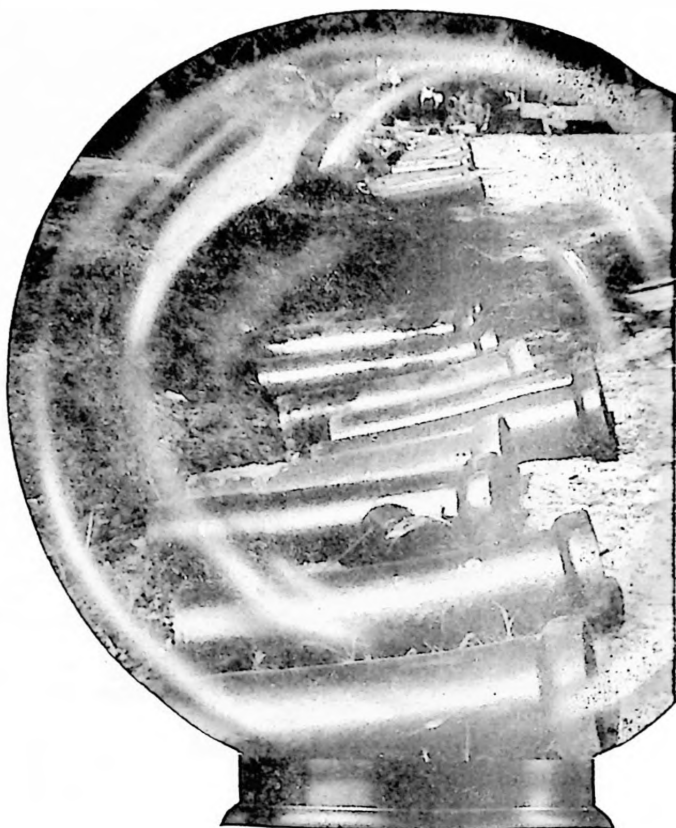
Two-Year Term—J. B. Carter.

In accordance with the By-Laws of the Section, Past Presidents H. L. Landry and T. J. Innes will also serve as members of the Executive Committee.

Following adjournment of the business meeting, Lee Fortier's orchestra provided music for dancing.

RANDALL MEYER, Secretary-Treasurer

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**Minutes of Meeting of the Lafayette Section, Louisiana Engineering Society
December 14, 1954**

The December meeting of the Lafayette Section of the Louisiana Engineering Society was held Tuesday, December 14, 1954 at 7:30 p. m. at Poor Boy's Riverside Inn.

The evening was begun with a supper, after which the business meeting was called to order by President Russell.

Mr. Z. L. Loflin moved that we dispense with the reading of the minutes. The motion was seconded by Mr. A. M. Bujard and carried.

President Russell called upon the guests and new members to introduce themselves.

After the introductory period, President Russell announced that the annual meeting of the Louisiana Engineering Society would be held in New Orleans, January 13, 14, and 15. He requested that as many members as possible attend the annual meeting.

There being no old business to discuss, the chair was turned over to Mr. Z. L. Loflin who introduced the guest speaker for the evening, Mr. Michael C. Abrahm, recent past president of the Louisiana Engineering Society.

In honoring the past presidents of the Lafayette Section, Mr. Abrahm presented certificates, in behalf of the members of the Lafayette Section, to Messrs. H. R. Mason, J. E. Jarman, A. M. Bujard, T. A. Bonnet, and F. J. Boudreaux.

After the presentation of the certificates, Mr. Abrahm gave an interesting and informative talk entitled, "Potentialities of Louisiana Engineers".

After a question and answer period the chair was resumed by Z. L. Loflin who thanked Mr. Abrahm on behalf of the Lafayette Section.

The chair was turned over to President Russell, who requested that we hear from the past presidents. They, in turn, expressed their appreciation.

Mr. T. A. Bonnet moved that the next meeting be held at Poor Boy's Riverside Inn January 18 instead of January 11 in order that more members from the Lafayette Section could attend the State Meeting of the Louisiana Engineering Society. The motion was seconded by Mr. H. R. Mason and carried.

After a discussion pertaining to the possibility of having the annual meeting of the Louisiana Engineering Society in Lafayette, Mr. Z. L. Loflin moved that we appoint a committee to study the feasibility of having the annual meeting in Lafayette. The motion was seconded by Mr. A. M. Bujard and carried. President Russell appointed Messrs. T. A. Bonnet, A. M. Bujard, and F. J. Boudreaux to this committee.

Mr. F. J. Boudreaux moved that the meeting be adjourned.

ALFRED W. SCHOEFFLER, Secretary-Treasurer

Minutes of Meeting of the Lake Charles Section of The Louisiana Engineering Society, December 13, 1954

The meeting was called to order by President Vincent at 7:45 p. m. at the Gulf States Utility Company office.

The minutes of the last meeting were read and approved.

The nominating committee report was presented by Mr. W. M. Davis, as follows: C. R. McBride, President; G. B. Wooster, Vice-President; R. R. L. Ward, Secretary-Treasurer.

There were no nominations from the floor and the nominating committee report was adopted.

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Mr. Burgess made a report of committee on reorganization and raising of dues. This matter was tabled until the annual meeting.

A motion was made by Mr. R. E. Burgess, seconded by Mr. W. M. Davis, that the Lake Charles section go on record as favoring leaving the organization of the Louisiana Engineering Society as presently set up with sufficient increase in dues to meet the necessary expenses. The motion carried.

President Vincent introduced Mr. Ed Turnley of Southern Bell Telephone Company who showed two very interesting films. One film was on transistors and the other one was on micro-wave and coaxial systems.

A question and answer period followed the showing of the films.

The meeting adjourned at 9:20 p. m.

G. B. WOOSTER, Secretary-Treasurer

**Minutes of Meeting of Monroe Section, Louisiana Engineering Society,
December 7, 1954**

The meeting was called to order in the Auditorium of the United Gas Service Center in Monroe at 7:45 p. m.

The announcement of the State meeting of the LES in Baton Rouge on December 9th was made.

A letter from the Louisiana Engineering Council was read in which they announced their present long list of proposed changes to the engineering law had been reduced to two for presentation to the Legislature in 1955. The changes were in general the addition of "An Engineer in Training" classification and amending of the definition of an Engineer to include this period of training. This letter asked that this Section indorse this change so that the Council would be in a better position to vote on accepting these changes in their next meeting early in 1955.

Mr. Jack Thigpen made a motion that the Section approve this action as read. After much discussion he amended his motion to read that copies of these recommendations be made and sent to each member of this section and a letter ballot answer be requested.

Mr. A. C. Thigpen announced that National Engineers Week would be February 20-26 and asked that a committee be appointed to work with him on this matter. Action on this was deferred for the new President to handle.

Mr. Leo Strole, United Gas Corporation Corrosion Engineer gave an interesting lecture and demonstration on "The Corrosion of Bare Metals" and "Catahotic Protection, The Prevention of Corrosion."

Mr. A. D. Williams of the nominating committee had the following nominations for the offices for the coming year:

President, Mr. A. P. Andrews; First Vice-President, Mr. R. A. Smith; Second Vice-President, Mr. Ellis Ross; Secretary-Treasurer, Mr. C. L. Denson.

This was put into the form of a motion, seconded and carried by acclamation.

Mr. Sidney Gill, Outgoing President, turned over the gavel to the Incoming President, Mr. Andrews, and the meeting was adjourned for refreshments.

F. W. ADAMS, Secretary-Treasurer

**Minutes of the Meeting of the Shreveport Section of the Louisiana
Engineering Society, Held December 7, 1954**

The meeting was called to order by President Hadra at 7:00 p. m. in the Palm Room of the Jefferson Hotel. Twenty-five members and one guest were present.

Mr. E. M. Gillen read a letter from the Louisiana Engineering Society concerning proposed reorganization and changes in the dues of the parent organization. After a discussion of the matter had taken place Mr. J. H. Ellis

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moved that a committee of three members be appointed to study this matter and make suggestions. Mr. A. A. Lyons seconded the motion, which was passed unanimously.

Mr. O. J. Dykes, Jr., spoke concerning the observance of National Engineers Week. All present were in favor of supporting this project.

Secretary Snyder read a letter concerning proposed changes to our By-Laws. Mr. Ralph S. Segall moved that acceptance or rejection of the proposed changes be voted on individually. The motion was seconded and passed unanimously. Article VI, Sec. 1—Mr. A. A. Lyons moved that it be accepted. The motion was seconded and passed 17 for, 3 against, 5 not voting. Article VII, Secs. 1 and 2—Mr. A. A. Lyons moved that it be rejected. The motion was seconded and passed by a large majority.

ARTICLE VI, SECTION 1—DISBURSEMENT OF FUNDS

The disbursement or use of the funds residing in the treasury of the Shreveport Section, or the disbursement or use of any funds collected by or in the name of the Shreveport Section, or the disbursement or use of any funds at any time accruing to the credit of the Shreveport Section shall be restricted to expenditures directly contingent upon the administration of the Shreveport Section and/or to expenditures in strict conformance to the objectives of the Louisiana Engineering Society as stated in the Constitution.

President Hadra read a list of the persons recommended by the Nominating Committee to be the 1955 Officers of our Section. They are:

President—Mr. O. J. Dykes, Jr.; First Vice-President—Mr. W. C. Sorenson; Second Vice-President—Mr. H. Lane Mitchell; and Secretary-Treasurer—Mr. William E. Fitzgerald (P. O. Box 886).

Mr. E. M. Gillen moved that these officers be elected by acclamation. Mr. J. H. Ellis seconded the motion which passed unanimously.

Program Chairman Segall introduced Mr. A. W. Hogan, Chairman of the Board of Appeals and Adjustments for the Shreveport Comprehensive Building Code of 1953, who discussed this new code and its operation and answered questions about it asked him by the members present. The speech was most interesting and informative.

President Hadra called attention to the annual meeting of the Louisiana Engineering Society in January, 1955.

There being no further business the meeting was adjourned.

MILLARD P. SNYDER, Secretary-Treasurer

Minutes of the Meeting of the Shreveport Section of the Louisiana Engineering Society Held January, 1955

The meeting was called to order by President O. J. Dykes, Jr., at 7:00 p. m., in the Garden Room of the Captain Shreve Hotel. Nineteen members and five guests were present.

It was moved by Mr. Ralph Segall and seconded by Mr. Robin Hood that the reading of the 7 December 1954 minutes be dispensed with and that they be approved as written. This motion carried and was so ordered.

Mr. E. M. Gillam, Chairman of the Committee to study and report concerning the proposed reorganization of the State Office of L.E.S. and proposed dues changes, made the following recommendations as developed by the committee.

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1. That the organization of the State Offices with the New Orleans section remain as at present;
2. That the Section annual membership dues be collected at the local level and be increased to \$10.00. One half of this amount would then be sent to the State Office. The finding of this committee were approved by those present.

It was moved by Mr. Snyder and seconded by Mr. Segall that the President be paid \$60.00 to cover his expenses at the annual meeting of the L.E.S. this month. This motion was approved by the members present.

Mr. Dykes then announced the appointment of his standing committees for the year 1955, as follows:

1. CHARTER AND RULES—W. W. Alsup, Chairman; J. H. Ellis, Cliff Frey.
2. ENTERTAINMENT AND PROGRAM—Robin Hood, Chairman; Quentin Hargrove, Wm. E. Fitzgerald.
3. PUBLICITY—Frank Grant, Chairman; Cris Demopulow, W. C. Sorrenson.
4. MEMBERSHIP—R. F. Fitzgerald, Chairman; Lane Mitchel, Wesley Glassell.

It was moved by Mr. Lyons and seconded by Mr. Snyder that the following resolution be referred to the Charter and Rules Committee for due consideration. This motion was approved by the membership and so ordered.

WHEREAS it has been the custom to send out notices of dinner meetings of this organization, and

WHEREAS it has been the custom to accept reservations for those dinner meetings, and

WHEREAS in the past it has become necessary for this organization to pay out of the treasury monies for reservations not honored,

WHEREAS the funds have been depleted to some extent due to this practice;

BE IT RESOLVED by the Shreveport Section of the L.E.S., that in the future, unless reservations are cancelled within 24 hours of time of meeting, the member making reservation and not attending or cancelling same shall be billed with the cost of same to this organization."

Program Chairman, Ralph Segall introduced Mr. Dewey Somdal, member of the Shreveport Planning Commission who discussed the Greater Shreveport Master Plan. Mr. Somdal was assisted by Mr. Ralph Bender, an Engineer, employed to assist the Planning Commission with their work. The discussion was most interesting and informative.

There being no further business, the meeting was adjourned.

WM. E. FITZGERALD, Secretary-Treasurer

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INCOME:

Advertising	\$ 881.23	
Annual Meeting	2,534.00	
Annual Outing	941.07	
Certificates, Sale of	54.00	
Dividends and Interest	285.72	
Dues, Gross	9,092.50	
Monthly Meetings (pro-rata of other societies)	316.69	
Proceedings, Sale of	4.00	
		\$ 14,109.21

EXPENDITURES:

Annual Meeting	\$2,735.49	
Annual Outing	789.04	
Annual Dinner	91.57	
Auditor's Fee	140.00	
Certificates, Cost of	27.50	
Dues, Chamber of Commerce	50.00	
Dues, Rebates to Sections	1,709.50	
Engineers' Week, Cost of	144.05	
Floral Offerings	41.10	
Louisiana Council of Engineers	95.60	
Library Service	48.00	
Medal Awards	40.00	
Miscellaneous	41.83	
Monthly Meetings, Cost of	883.43	
Office Supplies	98.71	
Postage	327.06	
Stationery and Printing	1,031.01	
President's Travel Expense	163.65	
Proceedings, Cost of	2,345.36	
Presidents' Appreciation Certificates	36.96	
Retiring President's Gift	60.00	
Salaries	2,450.00	
Scholarship Tuition	75.00	
Taxes	54.00	
March of Dimes	35.67	
		13,519.53
Operating Increases for 1954		\$ 589.68
Capital Expenditure:		
Cost of Binding Proceedings for 10 years		67.98
Net Increase for the Year		\$ 521.70

STATEMENT OF ASSETS

December 31, 1954

Cash, Whitney National Bank Checking Account		\$ 4,189.28
U. S. Savings Bonds, Series F:		
1942	\$1,000.00	
1943	980.00	
1945	914.00	
	887.00	
1950	1,572.00	
		5,353.00
Homestead Investments:		
Columbia Homestead Association	\$ 376.86	
Commonwealth Building and Loan Association	306.92	
Greater New Orleans Homestead Association	1,917.52	
Security Building and Loan Association	500.00	
Sixth District Building and Loan Association	500.00	
Union Savings and Loan Association	500.00	
		4,101.30
*Emblems on Hand		560.59
Total Liquid Assets, December 31, 1954		\$14,204.17
Total Liquid Assets, January 1, 1954		13,682.47
Increase during the Year		\$ 521.70
*Emblems on hand January 1, 1954	\$ 700.09	
Sales during the year	139.50	
		\$ 560.59

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1954 MEMBERSHIP REPORT

GAINS:

Elected:

Members	98	
Affiliate Members	8	
Junior Members	41	
Student Members	21	168

Reinstated:

Members	6	
Affiliate Members	1	
Junior Members	1	8

Total Gains 176

LOSSES:

Honorary Member deceased	1	
Life Members deceased	4	

Members:

Deceased	3	
Resigned	10	
Dropped	24	37

Affiliate Members:

Deceased	1	
Resigned	2	
Dropped	3	6

Junior Members:

Resigned	4	
Dropped	24	28

Total Losses 76

Net Gain 100

TRANSFERS:

Member to Honorary Member	1
Member to Life Member	7
Junior to Member	19
Student to Junior Member	18

SUMMARY:

Charter Member	1
Honorary Members	9
Life Members	71
Members	1033
Affiliates	70
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ENGINEERING REGISTRATION — ITS VALUE TO THE PROFESSION

By Ben T. Bogard*

Tonight, it seems that Dr. Donald Derickson should be talking to you about engineering registration. Dr. Derickson, whom most of you know, is probably the dean of all engineers who have had anything to do with registration in the State of Louisiana. He lives and breathes the subject, and devotes himself completely and untiringly to the betterment of the engineering profession and the work of the Louisiana State Board of Registration for Professional Engineers and Land Surveyors. During the five years that I have been privileged to serve with him on the Board, he has been a constant source of inspiration for the acquisition of greater knowledge and better understanding of engineering professionalism and the registration movement. Never have I left a board meeting without feeling that I had been, in some way, enlightened by his great fund of knowledge about engineering and about the place that the engineer occupies today in shaping the economic forces that control our modern society.

* Dean of the School of Engineering, Louisiana Polytechnic Institute, Ruston, La. Presented at a meeting of the Society, April 4, 1955.

Even so, I feel out of place coming to New Orleans to tell a group of New Orleans engineers about engineering registration. New Orleans has been the headquarters and the center of activities for engineering registration in Louisiana since the movement got started. Certainly, I doubt there is much I can tell you about the subject that you don't already know.

Actually, attempting to prepare a set of remarks or to find an avenue of approach that would bring you something different about the subject of engineering registration, something that you might not have given thought to, can leave one in a rather confused state. I could talk to you at some length about the mechanics of engineering registration, about the operation of the registration board, about the statistics of this work, or about many other things that might be of the nature of surface problems. It seems preferable not to dwell on those things, but to talk about other less tangible aspects, about the real purposes of engineering registration.

An engineer traveling around this state and in many other States, conscious of finding out what other engineers think about engineering registration and about engineering professionalism, will be amazed at the lack of interest, the lack of understanding, and the indifference of many engineers and of the general public to the subject. This revelation of the public's attitude and of the attitude of many registered and non-registered, but qualified, engineers, is quite disturbing to us. We are constantly concerned because our profession is not recognized or accepted like those of law and medicine. We want it so recognized, and bemoan the fact that it isn't.

Are we as engineers responsible for the lack of interest, the lack of understanding, the attitude that exists among large groups of engineers and among the general public toward the engineering profession? Yes, we are, and what do we do about it? Generally, we just continue our indifference. If you sow indifference you will reap indifference. Unionization of engineers is a problem that faces us today. If we are indifferent to unionization and to the forces that destroy solidarity of the profession, we will reap indifference from the public and from the young beginning engineers. If we are indifferent to the processes that bring about elevation, recognition, and prestige to the profession and its practitioners, you can rest assured that we will reap indifference from the public, and from the business concerns that employ engineers. If we are indifferent to the fact that the engineering profession is a public trust, that we owe the best services possible to the public, you can be sure that we will reap indifference from the public.

Recently, I had occasion to attend a meeting of one of our state boards that has jurisdiction over the distribution of millions

of dollars of state funds every year. During this board meeting a question arose about getting an engineering study performed. It was the decision of the board to get the study performed, and to seek bids from several engineering firms. A non-board member pointed out to the board that they should not request bids from engineering firms, as this was not generally acceptable practice, and that many firms, if they understood they were being asked to bid against other engineering consultants, would refuse to do so. The board disregarded this plea from a non-board member, and pointed out that only in the recent past they had had to have an engineering study made, had requested bid prices from several engineering firms, found that it was quite easy to get a number of them, and that the prices were quite different. Of course, this is a matter of ethics, and many of our engineering firms, if they realized that a price request sought in this fashion was actually a bid against another firm, would refuse to submit one. Such actions as this can be dangerous to the welfare and standing of the engineering profession. We do not commonly hear of medical clinics or groups being asked to bid on the performance of medical services, and for engineers to do so can only mean corner-cutting and lowering of quality of performance to secure highly competitive work. If bidding practices were common among engineers, certainly the public and public boards or bodies would not look with more favor on the engineering profession.

I know that all of you, or many of you, on one or more occasions recently, must have attended engineering meetings during which some engineer volunteered the information that his company didn't care whether its engineers were registered or not, he wasn't registered and he didn't see any value in being registered, since it would have nothing to do with his work or with his rate of progress with the company. Now, this same engineer, on other occasions, has probably wondered many times why his company officials or supervisors have assigned him tasks to perform that were beneath his capabilities and training. Doubtless, at many times, he has become very much concerned over the fact that his pay rate is low and no apparent way exists for getting it raised to where he thinks it should be. He is disturbed to notice that a bricklayer or a steam-fitter, or someone else, with less training and even less work experience, is being compensated at a higher rate than he is. He is disturbed because he doesn't get any greater recognition or any more say in the operation of the company, but he still never sees any reason to become a registered engineer and to desire that all other engineers in the company, who are equal or superior to him in training and abilities be registered. What is the answer to his dilemma? Possibly, it is education and unification; education of our

many highly trained and well-qualified engineers as to the value of professionalism and professional attitudes, and unification of the branches of the profession, and of the many engineering societies that exist today.

We must seek common goals, common purposes, and common standards of achievement. Is there any need for us to go in as many different directions as you can draw radii from the city of New Orleans? What is engineering registration except one step on the path toward unity? Aren't we trying to standardize requirements at a high level for practice of the profession in our state and to unite with other States in the same endeavor? Aren't we trying to reach a national standard of proficiency for engineering practice? Unity is essential in our profession if proper recognition is to be gained.

N. W. Dougherty, Dean of Engineering at the University of Tennessee, writing in the December 1954 issue of *The American Society for Engineering Education Journal* says, "We talk about unity, we organize for unity, and yet each group goes its merry way. Unity in the profession will probably come after a new generation of students has been conditioned for it."

We frequently wonder why the process of acceptance of engineering as a profession and the engineer as a professional man is taking place so slowly. If you read the current non-technical literature and a great deal of the semi-technical literature, you cannot help but encounter many articles severely criticizing the engineer. Some of this you must discount as coming from those who have merely an opinion but no basis in fact to the statements they make, but some of the criticisms and analyses of what's wrong with the engineer and the engineering profession, are sound and deserve sincere consideration on our part. Recently I read something from a book by Philip H. MacDonald, Professor of English in the College of Engineering at New York University. Professor MacDonald said,

"The types of college men who most definitely show the limits of a specialized education are the laboratory scientist and the engineer. There are, of course, plenty of narrow-minded graduates in other professions, but a lawyer, a minister, or even a physician seems to come sufficiently into contact with history and the arts to give him a tolerance of human nature that broadens his sympathies. Thousands of alert young Americans flock yearly to technical schools to be trained in the principles of physics, chemistry, biology, or engineering. By nature these youths have a knack for measurement and machinery, are apt at mathematics and laboratory experiments, perhaps possess ability at organizing research and systematizing labor. American industry makes use of such graduates and profits highly from their work. These young men give their con-

scientious efforts to our great corporations, but receive rather inadequate compensation. Their wages are often small in comparison with those of salesmen, legal employees, or even skilled labor. Handicapped for participation in administration and leadership by their background and their intense application to detail, such workers have a tendency to get tied down or to end in a technical blind alley. Many of them consciously adopt a policy of strenuous nose-to-the-grindstone concentration while neglecting important opportunities a little distance off. In a spirit of routine that they impose upon themselves, they narrow their abilities to highly specialized work and become engrossed in activities of the most confining kind."

George S. Odiorne, in an article entitled, "The Trouble With Engineers," appearing in the January 1955 issue of Harper's Magazine, says, "Anyone who doubts the seriousness with which industry takes the engineer shortage need only refer to the Help Wanted-Male section of any large metropolitan newspaper. An informal check I have made of the Sunday New York Times off and on over an extended period has generally revealed about 15 columns among the 50-odd in the classified section to be ads for engineers. This tops even the shortage of salesmen who rank second with about 11 columns. Rarely do the most enlightened discussions raise the question we ought to ask, which is how to use effectively the engineers we already have.

"The National Society of Professional Engineers is a notable exception, for a study it has made indicates the serious possibility that we are now wasting our most scarce and expensive manpower. Assuming this is true, the solution would appear to be simple. Study what engineers do, identify the non-engineering portions of it, and solve the engineering shortage by eliminating them. Unfortunately, this is not so easy as it sounds, for in first asking what an engineer is, we will encounter conflicting views. One is the engineer as society sees him, which is anyone who has accumulated technical knowledge above the workman stage, a definition that could easily include many salesmen and accountants. Second, there is the theoretical scientist version of the engineer, which pictures him as a watered-down physicist, chemistro-mathematician—a sort of hair-chested scientist gone wrong, who strides aggressively around the factory pretending to be a scientist. Allied with this is the business man's view of the engineer, which reflects similar scorn. Third, and most complicated of all, is the engineer's own view of what he is. If you ask the graduate of an engineering college what an engineer is he will probably tell you that an engineer is the graduate of an engineering college. He and his fellow degree-holders see themselves as the real members of the

profession as opposed to the hybrids and parasites that cling about the fringes. The degree-holders compose the influential societies which, in turn, have a large influence on the engineering colleges. They make up the voice of engineering. Unfortunately, it is from these men that the greatest pressure comes for the isolation of engineering from both science and business. Confident that the engineering curriculum is a thing of enduring and beautiful perfection, they attribute to the engineering graduate alone that set of habits called "the engineering mind,"—a tool so versatile and unique that it confers a virtual monopoly over logical processes to its possessor. In any society that keeps careers open to all, each professional group has the delicate task of maintaining standards without becoming an exclusive club. The basic demands on engineers will always be that their bridges and buildings stand up, but the idea of any profession as a closed corporation is inevitably frustrating, both to outsiders and to its members. As long as the folklore of the trade pictures the engineer as poised and self-sufficient, evenly balanced between two chasms into which he must never fall, then he will feel a rigid determination not to be tipped too far either way, lest the whole guild come crashing down. And it is such anxiety in good part which underlies the overt complaints about salary, job definition, and a higher place in the industrial hierarchy. To their credit many thoughtful engineers recognize this and realize also that the solution lies in the voluntary evolution in engineers' ideas about themselves.

"Much of the watering-down of engineering jobs, which I would heartily endorse and prefer to call 'bleeding', has been brought about at engineers' initiative. Their need is for an ability to visualize the culture in which they live, not as a collection of castes in which theirs alone is custodian of the public weal, but as a moving balance of interests that naturally conflict, intermingle, and change. They must undo the damage of an education which treats engineering as knowledge and engineers as individuals as though they could not be identified with the real needs and aspirations of the rest of society."

Certainly we as engineers don't want to accept such castigation as contained in these and many similar articles and do nothing about it. Our interest and concern is aroused and we must apply sound principles of analysis and logic—and good logic, on which the engineer prides himself, and, after we have sifted from the literature of adverse criticisms those things which are trivial and meaningless, take those remaining meaningful and factual statements and chart our courses for correction. Can we rightfully say that our work is of professional nature and those that practice it are, or should be, professional men? Dean W. R. Woolrich of the

College of Engineering of the University of Texas, writing in a recent issue of the *American Society for Engineering Education Journal*, cites an incident concerning the preparations for the American Society of Civil Engineers Centennial Celebration. He says, "About three years ago the members of the American Society of Civil Engineers, in planning a fitting celebration for the Centennial of their origin, sought out the proper officials in Washington and persuaded them to design and distribute a commemorative postage stamp that would pay fitting tribute to the professional engineers of North America. The ready response of the Post Office Department was commendable, but their judgment and knowledge of professional engineers came up short. As you will recall, the first stamp issued was to the honor and glory of one Casey Jones. Now all Americans enjoy the folklore and legends of the unusually rugged individuals who were so unique that they highlighted the parade of humanity in the growing up of our frontier states and in this group we would pay homage to the recounted prowess of railroad engineer Casey Jones. This does not, however, justify an authorized official of a great nation in making a selection of this driver of the throbbing locomotive as typifying the great contributions of the professional engineers of our nation for the current century of outstanding constructive accomplishment.

Another quote taken from a recent issue of the magazine *Consulting Engineer* from its page entitled, "Scraps and Shavings" says, "Any engineer with half an eye aimed away from the drawing board should know that the public does not consider him a professional man. He can meet with other engineers and discuss fees, bidding practice, codes of ethics, and engineering education, but the warm rays of professionalism shining down on the group are invisible to the general public. A full-page advertisement was recently carried in many daily newspapers under the heading, "I Am an Engineer". It showed a fine-looking young man neatly dressed in overalls. The commercial artist who presumably knows something about the subject he is depicting saw the engineer as a man in overalls and the advertising account executive approved the impersonation. We cannot deny that the general public thinks of the engineer as a mechanic in overalls or a surveyor in puttees. We may be professional men when we talk to ourselves, but we are manual laborers when we step on to the street".

The article goes on to point out that we all want professional recognition and at the end sums up into points the things which the writer of the article believes to be most essential for consideration if we are to get such recognition. He says, "There is the question of registration. Considerably less than half the graduating engineers today are registered with any state. Doctors and lawyers must be

registered to call themselves doctors and lawyers to practice. Eventually the same requirements must be imposed upon engineers. Method of compensation has much to do with our lack of recognition. Approximately three per cent of the engineers in this country work on a fee basis. This is the reverse of the situation with doctors and lawyers. If we are to have professional recognition the percentage of engineers in private practice must be increased. Still another requirement is a recognized and unified engineering organization. Without in any way giving up the many important societies dealing with specific branches of engineering we must have an engineers equivalent of the American Medical Association and the American Bar Association. Last, we must have one accepted code of ethics—a code that is taught in all engineering schools and one that is observed by all engineers. The code must be enforceable in that any engineer that acted outside of the code could be removed from the rolls of the society and his registration revoked”.

Need we go any further to realize that the things which we most want—an improved position from which to render and offer our services to the public, an improved social status, greater recognition of our efforts, and abilities, and greater monetary returns for our work, must come as a result of actions within our own ranks. Going to Webster's International dictionary for the definition of a profession, we find it stated to be, “The occupation if not purely commercial, mechanical, agricultural or the like to which one devotes oneself; the calling in which one professes to have acquired some special knowledge used by way either of instructing, guiding, or advising others, or of serving them in some art, as the profession of arms, of teaching, of chemists. The three professions, or *learned professions*, is a name often used for the professions of theology, law, and medicine. Broadly, one's principal calling, vocation, or employment”.

Immediately we would say certainly our work is of a nature to classify it as a profession. We may then wonder why ours is not classified among the learned professions. The qualities which the professional engineer must possess, in addition to those specified in the dictionary, are recognizable. All of us would agree, I believe, that the engineer must be a scholar, to some extent he must be seeking further knowledge about his specialized field and about society and about his relationship to mankind's endeavors. He must be well-educated in order that his viewpoint will be broad, he must be up-to-date in his field of endeavor because vast knowledge of a highly specialized process or processes is no guarantee of usefulness, for no matter what the extent of his knowledge the process may, as they are doing every day become obsolete and leave him with it by the wayside.

And, finally, the truly professional man must minister to the public, and I am sure we can say that is the one requirement of all professions. Recognizing these as the requirements of the engineer, let us go further and realize that the public—the industrialist, the business man, the tradesman—has not the interest or understanding to judge us as we wish to be judged, or to place us in the category we desire and deserve as to be placed. Don't misunderstand me, for it is not intended to imply that progress hasn't been made, but rather to lead up through this lengthy process to the steps that have been taken and are being taken to bring about the elevation and recognition of our profession. There is no need to delay in either of the steps, education or registration of engineers. For the benefit of all they can be taken concurrently. Our engineers must be educated to an awareness of their real usefulness in order that they accept registration, and they must be registered in order that a record of the competent men to practice the work of the profession will be available to the public and to the industrialist.

All that has been said here was realized many years ago by a group of leaders of the engineering profession who organized the Engineering Registration Movement. Wyoming took the first step, and passed an Engineering Registration Act in 1907, the Act having been brought about by need for determination of the men qualified to handle surveying in the water rights disputes that were occurring. Louisiana followed in 1908 with an act regulating the practice of civil engineering only. Now the 48 states and four territories have Engineering Registration Acts administered by state or territorial boards. Engineering registration got its real impetus in the early 20's when a great number of the states began to pass Registration Acts. As late as 1931 there were only 20,000 registered professional engineers in the United States and its territories. As of June 1954 there were only 200,000 registered engineers in this nation out of a potential of approximately 400,000. Although there has been a rather anemic professional spirit among engineers as a group, it now seems to have caught hold in a way that assures registration is here to stay, and that more engineers day by day are becoming away of its values and its possibilities. It is not designed for protection of the registrant from competition from the qualified and when registration is complete, there will be no free area allowing competition between the competent and the non-qualified. We do not have engineers registration laws for selfish, unnecessary reasons. We have them because the competent, qualified and trained have the right to expect to get protection against unethical practices and misrepresentation of the incompetent and untrained. Without registration laws there is no way to stop the practice of engineering by the non-engineers. There is no way to

stop the misuse and abuse of the designation "engineer" and there is no way to remove from the profession those who prove unqualified and unworthy. The registration laws define the scope of practice of the professional engineer and will prevent us from being subordinated to other professions or of having our profession fragmented. Many have thought of engineering as a combination of trades and specialties, and this feeling must be subordinated and rejected. Engineering should not be classified as a particular area of endeavor. It is more a point of view. A professional engineer must always possess analytical ability. Those who perform outstanding work usually possess exceptional creative ability. The professional engineer must be capable of designing, planning, investigating and supervising technical procedures requiring technical skill and engineering knowledge and training where individual responsibility and integrity are involved. He must understand his relationship to man's progress and economic and social development. It is for us to proclaim and work toward the unity of our profession. No matter whether we call ourselves chemical engineers, mechanical engineers, electrical engineers, or civil engineers, we have fundamentally the same basic educational training, the same governing professional qualifications, the same method of analytical approach to technical problems, the same professional ideals and the same interest in the profession's problems.

Engineering registration is bringing the legislators and the public to recognition of the fact that engineering is not an empirical calling, but a learned scientific profession. Registration has had a strong influence on the program of accrediting our engineering schools and colleges. It has done much to raise the standards in many schools and to make those who seek to obtain or retain accredited status uphold and improve standards. Since Act 73 of 1950, Louisiana has been registering engineers in all major branches of the profession. There is yet, however, one requirement that should be in our law that is totally lacking. That is a requirement of four years of professional practice after a graduate leaves the accredited engineering curriculum before he can receive full professional licensure. Associated with this should be the Engineer-in-Training Provision. The procedure of certifying young men as engineers in training immediately at the time of their graduation was inaugurated in New York State in 1943. It has rapidly gained favor as one of the most desirable features of the Engineering Registration Program. It is being used by 32 states and permits the young graduate to take part of the qualifying examinations immediately before or after graduation and, upon successfully passing these, he is officially certified as an engineer-in-training. This bridges the gap of the four years between graduation and receipt of the

license and serves to identify the young engineer with the profession during the most difficult period of his career. He is earlier acquainted with professional obligations and ideals, and develops a pride in his profession at an earlier date. He has the benefit of associations with older established engineers whose help and guidance to him will be invaluable. A recent check of the records reveals that 46 state and 4 territories now require some years of experience after graduation. Forty-three require 4 years, 4 require three years, 3 require two years, and Louisiana and Virginia are the only states of our nation that register graduates without experience. It certainly behooves us to work toward the addition of the experience and engineer-in-training provisions to our act in Louisiana, if we are to meet the high standards of the profession.

I hope that I have in some measure convinced you that engineering registration is the movement that will aid most materially on the national scale in effecting complete recognition and definition of the engineering profession.

* * *

Our Annual Outing. July 14, Thursday, has been selected as the day for golf and horseshoes and a general good time for our members and guests. In the evening, a dinner will be served, followed by entertainment. The place of these activities is the Colonial Country Club, New Orleans. John Rebold is Chairman and Bernard Louviere, Vice-Chairman. Further details will be sent later, but plan NOW to attend.

A STATEMENT FROM THE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND LAND SURVEYORS

Facts of the Curtis McDaniel Case. This is a matter which the Board of Registration for Professional Engineers feels is of vital importance to all the professional engineers of the State of Louisiana as well as the public at large. For this reason your Board which is charged, under the statute, with the supervision of professional standards of admission and practice in your profession, feels that you should be advised of the facts promptly.

Early in the year 1954, the Board was advised, through a complaint filed by a registered professional engineer, that certain construction was going on in the vicinity of Crowley, which involved the application of professional engineering principles, without an engineer being employed to supervise. Inquiry developed the fact that a Mr. Curtis McDaniel, of the City of Crowley, who advertised himself as a general contractor, was preparing plans and working drawings for the construction of rice dryers, rice storage plants, and other similar large structures. The Board was able to obtain photostatic copies of such plans and drawings prepared and issued by Mr. McDaniel but not signed by any professional engineer. Letters were written to Mr. McDaniel who conceded that he was not a professional engineer and had no engineers in his employ. Mr. McDaniel employed an attorney in Crowley who corresponded with the Board.

After some correspondence the Board proposed to Mr. McDaniel, and his attorney, that the facts in this case would be laid before the Attorney General of the State of Louisiana with an agreement that if the Attorney General ruled that McDaniel's activities were in violation of the regulatory statute (Act 73 of 1950) he would immediately cease and desist. If, on the contrary, the Attorney General ruled that there was no violation the Board would immediately close its file. Mr. McDaniel refused this proposal. Subsequently, it was reported to the Board that Mr. McDaniel was asked why he did not agree to submit the matter for decision to the Attorney General and he replied that he did not do it because he knew that the Attorney General would rule against him.

In view of McDaniel's attitude, the Board saw nothing to do but to present the matter to the District Attorney of Crowley.

On December 20, 1954, the District Attorney wrote to the attorney representing Mr. McDaniel stating that it was his opinion that Mr. McDaniel was in violation of the engineering statute. Thereafter, on instructions of the Board, one member of the Board filed the necessary affidavit charging Mr. McDaniel with practicing or offering to practice professional engineering without being prop-

erly qualified. The District Attorney, thereafter, of his own volition, laid the facts before the Attorney General and, on February 25, 1955, the Attorney General ruled, in an opinion, that Mr. McDaniel was in violation of the statute.

Your Board considers that the established facts make it plain that Mr. McDaniel is flagrantly violating the engineering statute and is, in fact, practicing professional engineering without proper qualification which, in the opinion of the Board, justifies a civil suit against McDaniel enjoining him from such activities. It is our intention promptly to proceed with such a civil suit against McDaniel looking toward an injunction to prevent his further violation. We believe that this civil action is the only course now available to the Board. It is our intention to take every step available in law to us to see that this situation is remedied and the offender properly brought to task.

We believe that there has been a great deal of publicity in this case and that the professional engineers are entitled to a statement of the facts. We feel that you should make this situation known to your friends and other interested parties. The Board is aware that no board or regulatory body which is forced, in the discharge of its duty, to press for compliance of law, can ever expect to avoid all criticisms or to always be popular. We are convinced, however, and we know that the professional engineers are convinced, that a proper modern regulatory statute such as Act 73 of 1950 is not only a matter of sound public policy but is of vital importance both to all members of the profession and to the public interest as well. Its vigorous and impartial enforcement is equally important.

This is a situation in which all members in the engineering profession are concerned. We hope and respectfully urge that you will give this statement such circulation as you feel is proper. If you wish additional copies we will be glad to have you write the secretary of the Board for them.

If you have suggestions or comments as to the course of action or procedure which the Board should follow, we will, of course, welcome them since, basically, the Board is the servant and the representative of the entire profession.

Yours sincerely,

State of Louisiana, Board of Registration for
Professional Engineers and Land Surveyors

Donald Derickson, Chairman, B. T. Bogard,
Vice-Chairman, Jesse Coates, A. D. Jackson,
Leo M. Odom, E. E. Taylor, and F. W.
zur Burg.

May 6, 1955

ENGINEERING BRIEFS

Highway and Public Works Engineers Aided by New Strain and Deflection Measuring Devices. Two devices announced recently should be of great interest to highway and public works engineers. One is a soil strain meter for measuring strains within earth fills, embankments, and other earthworks. The other is a deflection gage for measuring movement of concrete pavements, dams, embankments, and the like.

Direct determinations obtained by means of these devices are particularly important as a check on and an aid to the theory of design. Correlations with stress measurements are then possible in the determination of the modulus of elasticity at internal points of earth or concrete structures.

Either device may be permanently or temporarily embedded individually at various remote or inaccessible locations in dams, embankments, pavements, etc., either before or after construction. Readings may be taken intermittently or recorded continuously on automatic devices. Both devices have a range up to 2 in.

Strain sensitivity is nominally 0.0001 inch per inch. More or less of this value depends upon the sensitivity of the external indicating equipment and circuits. The sensitivity is independent of the range. Laboratory experimentation has shown that a sensitivity of 0.00001 inch per inch, and even greater, can be attained.

Deflection measurements are accurate to within 0.001 inch. The gage itself is capable of far greater accuracy but the mounting accuracy is usually of the order of 0.001 inch.

Electrical parts are sealed against effects of moisture, acids, and alkalis usually encountered in soil and concrete. Temperature effects are negligible.

Details are given in Bulletin 2258-N which is obtainable from the American Instrument Co., Inc., Silver Springs, Maryland.



New Drug Reduces Blood Pressure. One small tablet of a new inexpensive drug known as Su-3088, taken before breakfast, reduces blood pressure to normal throughout the day, according to a report made to the American College of Physicians by Dr. Keith S. Grimson of Duke Medical School and Duke Hospital.

Chemically, the new drug is dimethylaminoethyl tetrachloroisindolene bismethochloride. It was synthesized by Dr. Albert J. Plummer and associates at the Ciba Foundation, Summit, N. J.

The new drug is not of much use in mild cases of hypertension or when coronary arteries, kidneys, or brain have been damaged. It may, however, help most hypertensive patients, according to Dr. Grimson.

Prior to the discovery of Su-3088, hexamethonium (C-6) had been widely prescribed for the consistent reduction of blood pressure, but 4 to 16 tablets had to be taken. Another widely used drug for the purpose was ansolysen. A small first dose (50 to 100 mg.) of Su-3088 is said to produce longer-lasting effect than either C-6 or ansolysen.

According to Dr. Grimson, several drugs can be injected to reduce blood pressure, but no drug taken orally will reduce blood pressure, after a single dose, as effectively as SU-3088.



Long-Lived Radioactive Isotope of Aluminum Now Manufactured. A new long-lived isotope of aluminum known as aluminum-26, was discovered and is being made by scientists at the Carnegie Institute of Technology, Pittsburgh, Pa., headed by Dr. Truman P. Kohman. It takes about a million years for the substance to lose half its radioactivity. Previously known isotopes of aluminum had lifetimes of only a few minutes at most.

The discovery of aluminum-26 will allow it to be used in radioactive tracer studies, and makes possible the application of isotopic tracing to all known chemical elements.

Aluminum-26 was made by atomic bombardment of a magnesium target.—*Aminco Laboratory News.*



Notes.—Radio Corporation of America has recently announced a "music synthesizer"—electronic equipment that can imitate any known musical instrument and also create a multiplicity of sounds for which there is no known mechanical means of generation. The device has an endless capacity for rhythmical variety as well; to the electronics engineer, if not to the professional musician, it may open up an entirely new concept of music.

There may be more to this than meets the eye or ear. For example, one could start with the mathematically-expressed criteria for good music laid down by G. D. Birkhoff in his book "Aesthetic Measure," written 20 years ago. Then, using these criteria as a guide, one need only use the "slide-rule" for popular song composition, devised a few years back, to produce a saleable popular tune. A rhyming dictionary would enable the practitioner to (di)versify substantially away from the moon-June-tune routine.

Or, to employ a more technological approach, one might program slide-rule instructions on magnetic tape, used to control an electronic calculator whose product would be another magnetic tape capable of driving the music synthesizer. The music so generated need not even be listened to, after all; it could be recorded, at highest fidelity, and measured for aesthetic content by frequency analysis and punched-card classification of the phrasing. Furthermore, this measurement could be expressed in arbitrary units as a quality rating, i.e., an index of relative standing on the Hit Parade. A simple attachment might provide for automatic writing and mailing of royalty checks to ASCAP.

Thus, perhaps by 1984, with this whole procedure handled efficiently by machine, those who care to do so could console themselves with the sounds of nature, about which Ogden Nash has said:

"That's what shepherds listened to in Arcadia
Before somebody invented the radia."

— *Industrial Bulletin of Arthur D. Little.*



Speak Easy. Interlingua, an international language using the vocabulary of science and technology common to all the Western languages, is finding widespread use. Its application to technical literature, under the sponsorship of Science Service, dates only from 1953, but it is already used for summaries of articles appearing in twelve medical journals with international circulation, and one university has a course in Interlingua.

In the last century, over 300 international languages have been invented; some have a considerable literature. Interlingua shows unusual promise, however, because it is built from a common occidental word-root stock that already exists. Language reflects patterns of culture; today's pattern is Western science, and its vocabulary and concepts are embraced even by non-occidental scientists. Because the vocabulary of science is drawn largely from Greek and Latin roots, Interlingua resembles a Romance language heavily endowed with words common to English. It is easy to read for anyone who knows even a little of a Romance language, and it is easy for others to learn, since the grammar is so simple. There is no problem of gender, no declension of nouns and adjectives, no change of stem or personal inflection of verbs, and there is only one form of the articles.

Interlingua Summaries

The first journal to use Interlingua summaries was *Blood* (The Journal of Hematology), which started doing so in January, 1954. Now some twelve medical journals, including the South American *Archivos Peruanos de Patología y Clínica*, summarize their articles in Interlingua. Application to medical communication received considerable encouragement when the principal address of the International Congress of Hematology at Paris in September, 1954, was given in Interlingua. In the same month, abstracts of all the papers presented at the Second World Congress of Cardiology in Washington were published in the program in English and Interlingua. The same procedure was followed at the Symposium on Pediatrics held at Syracuse in October.

Hodie le jornales medical in le Statos Unite ha acceptate Interlingua como un facto, e un simile disveloppamento se ha initiate in Sudamerica. Altere campos scientific va sin dubita sequer. Il pare probable que le chimia va esser le proxime campo pro iste nove lingua.

There are three publications entirely in Interlingua: *Spectroscopia Molecular*, *Novas de Interlingua*, and *Scientia International*. The last is a translation of *Science News Letter*; excerpts are used in the Brazilian *Jornal de Ciências*. Other publications now available are "Interlingua a Prime Vista", an Interlingua-English Dictionary, an Interlingua Grammar, and primers for French- and German-Interlingua. Spanish and Italian primers are in preparation.

Communication is one of the greatest problems in science today. Any step that promises to speed up translation and publication is of tremendous interest. Interlingua, unlike other "new" languages, makes no claim to unify the languages of the world, but only to aid scientific communication; its range of application parallels that of science itself. Other languages, for cultural functions of a non-scientific nature, will maintain their place.—*Industrial Bulletin of Arthur D. Little, Inc.*



EMPLOYMENT INFORMATION. The Louisiana Division of Employment Security has established a Commercial and Professional Employment Office at 442 Canal Street, third floor, to assist technical engineers in their efforts to locate employment with the assurance that their application be kept in confidence and, further, that they be interviewed by personnel trained in the technique of professional job placement. This office also serves sales, clerical, managerial and other professional applicants.

The Louisiana State Employment Service also has available job placement facilities for industrial and service workers at 630 Camp Street and similar facilities for all job applicants living on the West Bank of the Mississippi River at an office located at 600 Second Street, Gretna, Louisiana.

All offices are open Monday through Friday from 8:00 a.m. to 5:00 p.m. There are **no fees** charged for any service rendered by these offices.

Those persons residing outside of the New Orleans area may file their application with the nearest office of our affiliated employment service where they will find similar facilities available for placement in the community as well as in other areas.

The Louisiana Engineering Society also maintains a standing Employment Committee that is ready and willing to assist both employer and employee in the engineering field. If you are seeking employment or need personnel, contact one of the following:

Raymond P. Bassich, Chairman, 824 Union St, New Orleans 12.

Eugene L. Fithian, Vice-Chairman, 318 Camp St., New Orleans 12.

* * *

New Members. The following have been elected to membership in our Society.

For Member

RICHARD O. BECKHAM, JR., Lafayette; age 39. Endorsed: A. B. Bell, O. E. Barron, J. A. Hebert. Birmingham-Southern College, A.B. 1937. Registered E.E., No. 3029. Southern Bell Tel. & Tel. Co., Jr. Engr., Engr., 1937-51; Exchange Plant Engineer, 1951-54; District Engineer, 1954-date.

GERALD R. DYSON, Shreveport; age 30. Endorsed: F. E. Hogan, C. K. Oakes, C. T. Watts. La. Polytechnic Institute, B.S.C.E. Jan. 1950. La. State University, M.S.C.E. Aug. 1954. Junior Member ASCE. Registered C.E., La., Tex. Roy O. Martin Lbr. Co., Inc., land surveying, mapping, subdivision development, 1950. La. Dept. of Highways, Project Engineer, 1950-52. La. Dept. of Public Works, Asst. Hydraulics Engineer, Area Engineer, 1952-date.

FRANK S. FOSTER, JR., New Orleans; age 35. Endorsed: W. E. Blessey, R. N. Bruce, Jr., T. J. Rennie. Tulane University, B.S.C.E. 1950. Member Society of Tulane Engineers. Registered C.E., La. Chas. V. Frey, C.E., research, land surveying for subdivisions, 1950. Geo. J. Glover Co., estimates, design, construction, 1950-51. Housing Authority of N. O., 1953-54. Portland Cement Ass'n., office engineer in charge of district office, 1954-date.

AUDLEY P. GUILLORY, Ville Platte; age 46. Endorsed: C. D. Brown, W. J. Johnson, W. E. Robert. Registered C.E., La. Member La. Hwy. Engrs. Ass'n. La. Dept. of Highways, Instrumentman, 1938-42. U. S. Army, Staff Sergeant, 1942-45. La. Dept. of Highways, Instrumentman, Party Chief, Project Engr., 1945 to date.

ELLIOTT H. HEWES, Lafayette; age 48. Endorsed: G. G. Hughes, J. C. Baehr, T. C. Morgan, Southwestern La. Institute, B.S. General Eng. 1928. Member SAME. Registered C.E., La. U.S. Army Dept., Corps of Engineers, N.O. District, Surveyman, Eng. Aide, Hydraulic Engineer, Civil Engineer, 1928-54.

CHARLES K. LANGLINAIS, Broussard; age 44. Endorsed: J. E. Jarman, C. J. Russell, W. E. Robert. Tulane University, B.S. course 1929-30. Registered Land Surveyor, La. State of La., Dept. of Highways, Rodman to Chief of Party, 1930-40; R/W Draftsman, 1940-42. Pan-American Airways, Inc., Chief of Party to Office Engineer, air and sea base construction in Brasil, S. A. 1942-44. U.S. Army Combat Engrs., 1944. Private practice of land surveying, 1945-date.

FRANK W. IRLAND, Shreveport; age 33. Endorsed: R. A. Nyquist, J. Kniveton, J. D. Smith. Bradley University, Peoria, Ill. B.S.M.E. 1949. Member Engineers Club of St. Louis. Registered E.I.T., State of Missouri (M.E.). Minneapolis-Honeywell Reg. Co., Application Engineer, 1949-51; General Steel Casting Corp., Mechanical Construction Engr., 1951-52. Sclas Corp. of America, Test and construction engineer, 1952-53. Libbey-Owens-Ford Glass Co., Mechanical Engr., Glass Technologist, Dec. 1953 to date.

PAUL J. MAYNE, Opelousas; age 40. Endorsed: C. D. Brown, W. J. Johnson, Jr., R. K. Rothrock, J. E. Jarman. La. State University, B.S.C.E. 1935. Member Nat'l Society Professional Engrs., American Cong. Surveying and Mapping, Nat'l Ass'n Corrosion Engrs. Registered C.E., La., Fla. La. State University, Instrumentman, Street and Bldg. layout, 1935. Dupont Co., Party Chief, Area Engr., Asst. Div. Eng., industrial plant construction, 1941-44. Gulf Engineering Co., layout, planning, supervision, marine pipe and equipment 1944-45. Self-employed, Civil Engineering and Surveying, 1945-47. Littrell Eng. and Const. Co., Municipal engineering, 1947-49. Private practice of civil eng. and surveying, Jan. 1949 to date.

CHARLES B. MOORE, Baton Rouge; age 35. Endorsed: D. A. Donald, R. H. Hudson, R. Meyer, T. J. Innes, Jr. Georgia Tech, B.S.Ch.E., 1947; graduate Ch.E. course, 1947. Junior member AIChE, 1953. Esso Standard Oil Co., Chemical Engineer, 1948-date.

ROBERT E. NEUMANN, New Orleans; age 44. Endorsed: C. B. Gamble, D. P. Mabel, C. Q. Wiggins. University of Minnesota, B.E.E. 1936. Associate Member AIEE. Registered E.E., La. Minneapolis-Honeywell Regulator Co., Sales Engineer, 1936-37. Self-employed Electrical Engineer and Contractor, 1937-date.

FRANCIS J. RICHARDSON, JR., New Orleans; age 37. Endorsed: D. P. Levy, Frank Riess, C. E. Reed. La. State University, B.S.M.E. 1939. Member Society of Naval Architects and Marine Engrs. Registered M.E., La. Gulf Refining Co., Lubricating Engineer, 1939-42. U.S. Navy, Engineering Officer, 1942-46. George Engine Co., Sales Engineer, 1946-48. Richardson Engineering Co., President, construction and repair of oil field boats and barges, 1948-53. Mechanical Equipment Co., Sales Engineer, 1953--date.

JOHN H. RUSCH, JR., New Orleans; age 31. Endorsed: A. H. Jensen, R. M. Seago, D. W. Stewart. Case Institute of Technology, B.S.Ch.E. 1945. Member Alpha Chi Sigma. Registered P.E., New York, West Virginia. U.S. Navy, Deck Officer, 1945-46. Dowell, Inc., 1946-55, present position, District Sales Engineer.

GEORGE H. SCHMITT, JR., New Orleans; age 39. Endorsed: H. M. Blain, Jr., J. H. Collins, Sr., J. S. Janssen. La. State University, B.S.E.E. 1938. N.O. Public Service Inc., Measurement Engineer, 1939-41 and 1945-date. Active duty, armed services, 1941-45.

LEE N. SPINKS, New Orleans; age 36. Endorsed: F. B. Grevemberg, M. P. Watson, L. E. Stewart, S. E. Trouard. La. Polytechnic Institute, B.S. M&EE, 1939. Nat'l Ass'n of Corrosion Engrs., Member. Registered E.E., La. United Gas Pipeline Co., Rodman, chairman, draftsman, 1939-40; Asst. Engineer, 1940-52. Cathodic Protection Service, Senior Corrosion Engr., 1952-date.

ROGER G. STEVENS, Lafayette; age 56. Endorsed: E. Domingue, J. R. Troxler, F. J. Boudreaux. University of Ill., B.S.Ch.E. 1920; M.S.Ch.E. 1922. Harvard University, AM & PhD, Chemistry, 1927. Member AIChE, American Chemical Society, American Society for Engineering Education. Registered Ch.E., La. Western Electric Co., Metallurgical Engr., 1927-28. Chicago Detergent Laboratories, Vice-Pres., part owner, 1928-29. Continental Can Co., Chemical Engr. and Food Technologist, 1929-46. Stevens Foods, Inc., Vice-Pres.-Gen. Mgr. and part owner in charge research and manufacturing, processing of food products, 1952. Southwestern La. Institute, Professor and Head, Dept. of Chemical Engineering, Feb. 1952-date.

JAMES S. TARBUTTON, Ruston; age 45. Endorsed: B. T. Bogard, M. R. Johnson, W. E. Owen. La. Polytechnic Institute, B.S.E.E. 1930. La. Highway Dept., Rodman, Levelman, 1930-32. Self-employed, radio and refrigeration service, 1932-40. La. Polytechnic Inst., Radio and Electrical Engr., Dept. of Bldgs. and Grounds, 1940-43; Acting Supt. B & G, 1943-46. Northwestern Jr. College of LSU, Instructor, all engineering courses offered, 1946-49. North La. State College, Asst. Professor, E.E., Sept. 1954-date.

WILLIAM B. WELBORN, JR., Lafayette; age 52. Endorsed: R. T. Brooks, E. E. Guillot, Jr., J. E. Jarman. Member La. Hwy. Engrs. Ass'n. Registered C.E., La. (Public Employee). Gayne Electrical School, Chicago, 1926-27. La. Hwy. Commission, Sr. Plant Inspector, Rwy. Inspector, 1930-40. La. Dept. of Highways, Asphalt, Section Foreman, Jr. Traffic Engr., Jr. Project Engr., Asst. District Engr., Resident Mtce. Engr., 1952-55.

For Transfer From Junior To Full Member

ALFRED J. LOUP, JR., Baton Rouge; age 34. La. State University, B.S.C.E. Registered C.E., La. La. Dept. of Highways, Bridge Designer, 3½ years. Dunham Wilson Co., Chief Draftsman, 2 years. The Wilson Co., drafting, design, erection of steel fabrication, 1 year.

HAMPTON PRIMEAUX, Franklin; age 38; Southwestern La. Institute, B.S.C.E. 1949. Registered C.E., La. (Public Employee). U.S. Army, 29th Eng. Topo. En., 1939-46. La. Dept. of Highways, Party Chief, Jr. and Sr. Project Engr., 1949 to date.

JAMES A. STELLY, Baton Rouge; age 28. Louisiana State University, B.S.E.E. 1949. Registered E.E., La. Gulf States Utilities Co., Lighting Engineer, Industrial Engineer, Supervisor Commercial Sales, 1950 to date.

JACOB B. SWANSON, JR., Baton Rouge; age 32. Louisiana State University, B.S.M.E. Esso Standard Oil Co., June 1947 to date. (Equipment Inspector, 2 yrs. Maint. and Construction Engr., 2 yrs., Process Division Foreman, 3 yrs., Process Eng. Dept., ½ yr.)

For Affiliate Member

JOHN GORDON WALLIS, New Orleans; age 41. Endorsed: W. J. Drawe, Jr., H. A. Liles, T. H. Nolan. Georgia School of Technology, 1932-37, B.S. (Four years of Architecture, finished in Industrial Management). Napko Paint and Varnish Works, Houston, 1946-54. Regional Manager, La. Division, sales and service of paint and protective coatings to architectural, marine and industrial users in La. and Miss.

For Junior Member

HAROLD F. LEIENDECKER, Baton Rouge; age 22. Northwestern University, B.S.C.E. 1954. Tennessee Valley Authority, Engineering Aide (Student Engineer) as part of co-operative education college curriculum. Esso Standard Oil Co., Engineer, June 1954 to date. Junior Member ASCE.

OBITUARY OF HAMPTON REYNOLDS

The death of Hampton Reynolds on February 3, 1955 removed from the ranks of the Louisiana Engineering Society one of its life members and most distinguished Civil Engineers.

Mr. Reynolds was born in the City of New Orleans on December 20, 1874, the son of Emma Leonora Waters and Henry William Waterman Reynolds.

He received his education at the Louis T. Leche School for Boys, Tulane High School, and Tulane University.

Mr. Reynolds was the husband of the late Elma Lewis Friou and is survived by one brother, Charles Reynolds; two sisters, Mrs. Dora Tanner and Mrs. W. W. Reeder; three daughters, Mrs. Richard W. Leche, Mrs. George L. Bott and Mrs. Oscar P. Wren; and six grandsons.

Hampton Reynolds' life work was in the civil engineering and construction fields on so many of the major projects in the city of New Orleans and elsewhere.

Mr. Reynolds constructed wharves for the Port of New Orleans, foundations for the huge Army Supply Base, now the Port of Embarkation for the Armed Forces, many, many miles of paved streets, several of the large storm water drainage canals of New Orleans, highways such as the Old Gentilly Highway to Chef Menteur, plus a large list of heavy construction jobs.

Hampton Reynolds served as the first Civil Engineer for the Public Belt Railroad of New Orleans; handled for the City of New Orleans many of the Civil Works Administration and Public Works Administration projects during the dark days of the early Thirties depression; prepared the first Lakefront project at New Orleans, including the paving of such boulevards as Lakeshore Drive, Canal Boulevard, Marconi Drive, Beauregard Avenue, Elysian Fields Avenue, Franklin Avenue, Southline Drive, and the landscaping of the lake front.

He was instrumental in developing the plan for the Lake Vista Subdivision located on the lake front, which is one of the finest residential subdivisions in the country.

He was one of the first members of the Board of Commissioners of the Housing Authority of New Orleans; a Member of the Southern Yacht Club, the Lakeshore Club, and the Louisiana Engineering Society.

Hampton Reynolds attained stature in his chosen field in this city and environs—as has been noted—abounding in testimonials to his talents. Yet it is not only in this respect that his passing is a distinct loss to the community as well as to his family, members of the Louisiana Engineering Society and his other friends. Mr. Reynolds was an individualist in whom there existed energy, drive, tenacity and inventiveness that combined to surmount obstacles that would have dismayed an ordinary man. Being human, he was subject to human frailties, but he was conscientious in everything he undertook, without regard to prejudice or favor, cherishing with jealous eye his well-deserved reputation for professional integrity of the highest quality.

It is fitting, therefore, that this obituary be read at a meeting of the Louisiana Engineering Society, entered into the Minutes and published in the Proceedings, and that copies of this obituary be sent to members of the family of the late Hampton Reynolds.

J. GILBERT SCHIEB
ROBERT J. KUHN
HENRY BOH

OBITUARY OF DAVID W. STEWART

No words of ours, nor the hundreds who admired, respected and loved him could possibly convey the full extent of the sorrow and regret that all felt at the death of our beloved member and friend, David W. Stewart, who at the age of 65, in the prime of a fruitful, productive, and active life, passed on to his reward on the 23rd day of February, 1955—the day following Mardi Gras.

Although a native son of Scotland, no individual could have become a more ardent and active American citizen than this man, whom hundreds of us affectionately knew as "Dave", nor could anyone have pursued with greater zest and relish both the professional and personal side of his life, either of which do more than full credit to him as a person and as an exemplary American citizen.

Dave joined the staff of the New Orleans Public Service Inc., in 1917, having come to them from the Jacksonville (Florida) Municipal Power Plant. At the time of his death, he had advanced to one of the key positions in the entire operation and was in charge of the mechanical operations of all power plants operated by New Orleans Public Service Inc. at the Market Street and Paterson Stations. It was largely his guiding hand which conceived and aided in the tremendous expansion of the facilities of these power plants.

Despite the tremendous energy and enthusiasm with which he followed his work and with which he inspired all of his associates, Dave gave generously of his time and interest to many civic endeavors, all of which will serve as living monuments to his memory. Dave was particularly interested in the Boy Scout movement and served as City Commissioner from 1938 to 1949. He was President of the Kiwanis Club in 1944 and was extremely active in all of its work, particularly those phases dealing with various youth activities they sponsored. He was Vice-President of Kingsley House Association since 1951. Dave was also prominent in church work, Masonic affairs and in the activities of various professional engineering societies.

He was one of the principals in the conception and organization of the Engineers' Club of New Orleans and had just recently been elected its President. He also was a member of the Edison Electric Institute and the American Society of Mechanical Engineers.

In addition to his having been elected President of the Engineers' Club of New Orleans, Dave had received many similar honors from his professional friends and associates in other forms. In 1941 he was elected a member of Tau Beta Pi, national honorary engineering fraternity. In the same year he served as President of the Louisiana Engineering Society, and in 1950 was awarded Life Membership in that organization.

No job nor any person was too large or too small to deserve, in Dave's opinion, his full and heartfelt interest. While his achievements in both his chosen work and in the business and social aspects of the professional world are legion, Dave will no doubt be best remembered for the cheery, enthusiastic, considerate and kindly touch with which he pursued his daily work and dealt with his fellow men. Typical of his entire life, Dave was on the job working, planning, guiding, and counseling when his final hours arrived. While he is no longer among us, a little of Dave Stewart will live on forever in the hearts of all of us who were fortunate enough to have known him.

JAMES M. TODD
WALTER COOKE
ALLAN J. HARRIS, Chairman

MINUTES OF THE MEETINGS AND BUSINESS OF THE SOCIETY

Minutes of Meeting of the Board of Direction Held on Monday, February 7 at the Engineers' Club of New Orleans, Hotel DeSoto

The meeting was called to order by President Seago with Messrs. Drawe, Freeman, Macdonald, McLellan, Nelson, Poole, Taylor, Wallace and Fernandez present. Mr. McLellan moved that minutes of the preceding meeting be accepted as corrected, seconded by Mr. Wallace and carried. A report of the Employment Committee for 1954 was read, after which discussion took place on the feasibility of listing job openings and qualifications of available engineers in the Proceedings. The secretary was instructed to take up the matter with the editor.

A report of the Reorganization Committee was tabled until the next meeting, when action on its recommendations is to be taken.

Mr. Wallace, Chairman of the Finance Committee, presented a budget for 1955 and moved that it be accepted. Motion was seconded by Mr. Poole and carried.

A note of thanks for flowers sent to the family of the late Lester F. Alexander was read.

A letter of appreciation from Mr. Robert J. Kuhn, recently elected to life membership in the society, was read.

The secretary reported that, at the request of Louisiana State University, programs for a High-speed Computer Conference to be held there on February 15-15-16 were sent to all L.E.S. members.

A letter from Mr. Hermann Lehmann giving information for the May meeting program was brought to the attention of the board.

Mr. Freeman moved that Section 1 of Article 6 of the Shreveport Section's constitution, entitled "Disbursement of Funds" be approved as submitted by the section. Motion seconded by Mr. Nelson and carried unanimously. (A copy of this addition to the section's constitution is attached hereto.)

Upon motion by Mr. Macdonald, seconded by Mr. Poole, Emeterio I. Ramirez was reinstated to junior membership in the society.

Upon motion by Mr. McLellan, seconded by Mr. Drawe, resignations of the following were accepted with regret: Thomas H. Arnold, A. A. Balcom, Jr., J. B. Coltharp, S. L. Kennedy, Robert W. Seymour, W. S. Steed, John L. Wantland.

Upon motion by Mr. Poole, seconded by Mr. McLellan, Roy W. Best was dropped from the roll in accordance with his own request.

In accordance with the constitution, Mr. Nelson moved that the elections of David C. Rosser and Jack J. Tarto be declared void since more than 90 days have elapsed since notice of election was forwarded and they have not accepted same. Motion seconded by Mr. Drawe and carried.

Mr. Wallace moved that the board approve the action taken by the president and the secretary in cashing a Series F U.S. Savings Bond that had matured and placing the proceeds from same in the checking account. Motion seconded by Mr. McLellan and carried. This action was taken because the bond had matured and no longer earned interest. It was agreed that at the next meeting the Finance Committee would recommend a new investment for these funds.

Mr. Drawe gave an outline of the program for Engineers' Week to be observed February 20-26. Mr. Nelson moved that the Program Committee consider Engineers' Week activities when making plans for the 1955 program. Motion seconded by Mr. Wallace and carried.

After some discussion the board recommended that President Seago appoint committees to prepare obituaries for the late esteemed life members, Lester F. Alexander and Hampton Reynolds.

Mr. Macdonald moved that the next annual dinner meeting be held at another locality because of the noise prevalent at Arnaud's Restaurant this year. Motion seconded by Mr. Poole and carried.

President Seago presented a list of personnel for 1955 standing committees.

Mr. McLellan moved that the Committee on Honors and Awards be appointed in a manner similar to the other standing committees. Motion seconded by Mr. Wallace and carried.

Mr. Macdonald moved that the president appoint the above mentioned personnel to the respective committees and that he have the authority to make necessary substitutions for those who may not be able to serve. Motion seconded by Mr. Wallace and carried.

Mr. Nelson moved that the names of all applicants for membership approved by the Membership Qualifications Committee during 1955 be placed on the quarterly ballots. Motion seconded by Mr. Drawe and carried.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Regular Meeting of the Society held Jointly with the N. O. Section American Society of Mechanical Engineers, Engineers' Club, Hotel DeSoto Monday, February 7, 1955

The meeting was called to order by President Seago with approximately 100 members and guests present. The president welcomed members and guests of A.S.M.E. Mr. Freeman moved that the reading of minutes of the preceding meeting be dispensed with, seconded by Mr. Davis and carried. The secretary then read minutes of the annual meeting of the Board of Direction with State Section Officers.

Mr. Drawe gave an outline of the activities to be held in New Orleans during Engineers' Week, February 20-26.

The chair then was relinquished to Mr. Max P. Watson, Chairman, New Orleans Section, A.S.M.E., who introduced the speaker of the evening, Mr. A. W. Francis, Vice-President, National Tank Company, Tulsa, Oklahoma, who spoke on "Low Temperature Separation Equipment for Gas-Condensate Wells". The lecture was illustrated with colored slides and was most interesting and informative.

After the usual question period, the meeting adjourned with a rising vote of thanks to the speaker.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Board of Direction Held on Monday, March 7, 1955

The meeting was called to order by President Seago with Messrs. Andrews, Drawe, Edwards, Freeman, Gillen, Macdonald, McLellan, Nelson, Poole, Taylor, Wallace and Fernandez present. Messrs. M. C. Abraham and C. T. Watts also were present by invitation.

Minutes of the preceding meeting were accepted as read after which President Seago requested that the order of business be dispensed with so that late-comers could participate in the discussion on reorganization.

Upon the recommendation of the board, President Seago appointed Messrs. Allan J. Harris, Chairman, James M. Todd and Walter Cooke to prepare an obituary for the late life member and former president of the society, David W. Stewart.

The secretary reported that he had contacted the editor of the Proceedings with regard to publishing data on positions available and qualifications of engineers seeking employment and that the editor had stated he would willingly do so, but since printing of each issue requires a month and since the magazine appears only at quarterly intervals the information would be at least one month and as much as four months old and consequently of little value. The board members agreed and it was suggested that a box notice or an article in the Proceedings stating that the society has an Employment Committee might be worth while.

Mr. Nelson moved that the following members be dropped for delinquency in dues and because of unknown address:

W. W. Barnes, Jr., Lake Charles; Charles E. Cole, Lake Charles; F. V. Daigle, New York; C. W. Gorton, Indiana; K. D. R. LaCroix, Baton Rouge; J. R. Norman, Texas; M. S. Pendergast, Jr., Lafayette; J. E. Prado, Brazil; S. V. Shields, Lake Charles; V. O. Spiller, Monroe.

Mr. Wallace moved that the secretary be authorized to purchase a cabinet to contain the society's addressograph plates. Motion seconded by Mr. Nelson and carried.

A note of appreciation from the family of the late Hampton Reynolds was read.

Mr. Poole moved that the resignation of R. L. Green be accepted with regret, seconded by Mr. Andrews and carried.

Mr. Andrews moved that Gerard R. Poirier be dropped from the roll in accordance with his request, seconded by Mr. Poole and carried.

Mr. Wallace, Chairman of the Finance Committee, moved that the society reinvest the funds received from the U. S. Savings Bond recently redeemed in a new savings bond, and that the treasurer be authorized to do likewise with proceeds from another bond due to mature in April. Motion seconded by Mr. Macdonald and carried.

Minutes of the Reorganization Committee's meeting held on January 14 were read by the secretary, after which Mr. Edwards moved that the board accept the recommendations of the committee; that, while a state organization of L. E. S. is desirable the present membership does not justify such an organization at this time and therefore it is not advisable to reorganize. Motion seconded by Mr. McLellan and carried.

Discussion followed on the question of whether the membership dues should be increased. Mr. Edwards stated that he believed dues should be raised, but suggested that state dues for members and affiliates be increased to \$8.00 and collected by the parent organization, which would rebate only \$3.00 to the section. The local section would then assess its members \$2.00 additional dues, which would be collected by the local secretary. It was his

opinion that collection at section level creates interest and closer relationship between officers and members of the section. He displayed a local membership card issued by the Alexandria Section upon payment of the local assessment.

Mr. Andrews stated he was not sure that Mr. Edwards' suggestion would be popular because of the double collection and the fact that the amount of rebate would remain the same as at present. He advised that the present set-up of the Monroe Section includes collection of local dues such as Mr. Edwards recommended and in his opinion one billing for total annual dues is preferable.

The secretary suggested that, should one billing be recommended by the board and adopted, the sections could issue local membership cards upon receipt of rebate from the parent organization.

Mr. Poole believed that everyone should pay the same amount of dues, but advised he was willing to go along with the recommendation of the committee.

Mr. Gillen, former president of the Shreveport Section and speaking for them unofficially, approved of the amount recommended and stated that he did not anticipate any difficulty in collection nor any drop in membership in the Shreveport area due to such an increase in dues.

A telegram from Mr. Russell, President of the Lafayette Section was read, in which he advised that the Lafayette Executive Committee opposed the proposed increase in dues to \$10.00 for members and affiliates and \$5.00 for juniors, but stated that his vote could be cast for \$8.00 and \$4.00 respectively.

Mr. Abraham then summarized the three plans presented at the meeting. Mr. Macdonald, a member of the Reorganization Committee, stated that a number of plans and modifications had been thought of and discussed by the committee, and he was of the opinion that the board should confine its action to the recommendation of the committee. He also complimented President Seago for mailing to each board members a clear, concise and impartial presentation of the issue.

Mr. Macdonald moved that the committee's recommendation be accepted and submitted to the membership-at-large as a proposed amendment to the constitution in conformance with Article 14; but that prior to so doing a letter be sent to the membership informing them that the board is in favor of the following revised schedule of dues:

	Annual Dues	Section Rebate
New Orleans Member or Affiliate	12.00	—
Section Member or Affiliate	10.00	5.00
New Orleans Junior Member	5.00	—
Section Junior Member	5.00	2.50
Out-of-State Member or Affiliate	5.00	—
Out-of-State Junior Member	3.00	—

In the discussion that followed it was agreed that, should this amendment be adopted, the new schedule of dues would become effective January 1, 1956. Motion seconded by Mr. Wallace and carried, with one dissenting vote by Mr. Russell of Lafayette as stated in his telegram above mentioned.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of L.E.S. held on Monday, March 7, 1955 in the Jackson Room, St. Charles Hotel

The meeting was called to order by President Seago with approximately 60 members and guests present. Mr. Taylor moved that the reading of minutes of the preceding meeting be dispensed with, seconded by Mr. Graham and carried. The secretary then read minutes of the regular meeting of the board of direction held on February 7.

Mr. Michael C. Abraham then read an obituary of the late Life Member Lester F. Alexander, after which a moment of silence was observed in his memory.

President Seago then introduced the speaker of the evening, Mr. John Gammell, Director of Graduate Training, Allis-Chalmers Manufacturing Company, who spoke on the subject "Economic Growth and Security Depends on Scientists and Engineers".

After an interesting question period, the meeting adjourned with a rising vote of thanks to the speaker.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Board of Direction held on Monday, April 4, 1955

The meeting was called to order by President Seago, with Messrs. Andrews, Drawe, Freeman, Macdonald, McLellan, Nelson, Taylor, Wallace and Fernandez present. Messrs. Calvin T. Watts and Bernard Louviere also were present by invitation. Mr. Nelson moved that minutes of the preceding meeting be accepted as read, seconded by Mr. McLellan and carried.

In the absence of Mr. Johnnie E. Rebold, Chairman, due to illness, Mr.

Bernard Louviere, Vice-Chairman of the Outing Committee presented a program for the 1955 outing, to be conducted similar to last year's affair at the Colonial Country Club on July 14. Fees for golf, horseshoe pitching and dinner to be the same as last year. Mr. Nelson moved that \$150.00 be allowed for underwriting the 1955 outing and that Mr. Louviere be authorized to proceed according to his recommendations. Motion was duly seconded and carried.

The secretary reported that all applicants named in the March ballot had been elected to their respective grades. A copy of the ballot is attached to these minutes.

Mr. Drawe moved that the following resignations be accepted with regret: James Y. Briggs, Shreveport; W. David deLaureal, New Orleans; Leon Godchaux II, New Orleans; Frank R. Groves, Jr., Non-res., (J); Willis D. Morris, Baton Rouge; Robert E. Weaver, New Orleans, (J); E. L. Wheless, Shreveport; Ernest R. Perez, Jr., New Orleans.

A letter from Mr. John R. Tusson on the subject of establishment of a modern technical library to serve industry in the New Orleans area was read. Dr. F. M. Taylor advised that he would obtain additional information on the matter, therefore action was postponed until the May meeting.

A letter from Mr. A. D. Strange-Boston endorsing the proposed increase in dues was read.

The secretary advised that, in accordance with the motion carried at the last meeting, a \$1,000 U. S. Savings Bond (No. M-156155-J) had been purchased in the name of the society.

The secretary also reported that a cabinet to hold addressograph plates had been ordered.

Mr. Nelson moved that the secretary be authorized to purchase a new addressograph machine, the cost not to exceed \$400.00. Motion was duly seconded and carried.

The secretary was instructed to include in the May meeting notice advice that discussion of the constitutional amendment regarding dues would be on the agenda.

A letter from Mr. B. R. Stanerson, Assistant Secretary, American Chemical Society, Washington, D. C., was read, in which attention was brought to that organization's statement of policy relating to specialized personnel in connection with the Universal Military Training and Service Act. During the discussion that followed it was brought out that this policy has been endorsed by the AIChE, AIEE, AIMME, ASCE, ASME and other national engineering societies. Accordingly, Mr. Wallace moved that the Board of Direction endorse the above mentioned statement of policy by the American Chemical Society. Motion was seconded by Mr. Freeman and carried unanimously.

It was moved, seconded and carried that the following members be dropped for non-payment of dues:

New Orleans Members: Norman G. Alvis, Charles R. Camp, Jr. (J); Eugene A. Frisch, Jr. (J); George H. Dudley, Edward J. Goller (J); Nils E. Hansen, Boleslaus M. Kopacz, Albert E. Marks, Russell E. Pardee, H. P. Puyper (J); Michael H. Reilly.

Lake Charles Members: John M. Condren, Gaylord H. Cox, Conrad E. Grafton, L. R. Hays, Roscoe B. Jones (J); Matthew McC. Spangler (J); George B. Walther, Jr.

Lafayette Members: Rene F. Delahoussaye (J); Pierre L. Delcambre (J); Robert F. Helms.

Baton Rouge Members: Louis A. Bergeron (J); Carey J. Hodges (J); Byron P. Lyons, Jr., (J); Austin J. Mary, J. J. Munding, Bryce K. Tomlin (J).

Shreveport Members: Thomas L. Aubin, Jr. (J); John W. Easom (J); Andrew H. McDonald; Conrad W. Marvin; Charles W. Taylor.

Non-Resident Members: Quincy O. Craig, Marshall B. Leicht (J); George B. McGuire, William C. Nation (A); L. E. Petty, (J); Cecil S. Sonnier, (J); Bobby R. Votaw, (J).

Upon the request of several board members, action on Messrs. Hodges, Marv. Munding, Tomlin and McDonald was postponed.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the L.E.S. held on Monday, April 4, 1955 in the Beauregard Room, St. Charles Hotel

The meeting was called to order by President Seago, with approximately 100 members and guests present. Mr. Knost moved that the reading of minutes of the preceding meeting be dispensed with, seconded by Mr. Rombach and carried. The secretary then read minutes of the board meeting held in March.

The secretary read an obituary of the society's late esteemed member and former president, David W. Stewart, after which a moment of silence was observed in memory of the deceased.

Mr. Max P. Watson, Chairman, N. O. Section, ASME, announced that on Friday, April 15 his society would have Dr. Robert T. Knapp of California Institute of Technology to speak on "Cavitation", and that members and friends of L. E. S. were cordially invited.

Dean Lee H. Johnson of Tulane University then introduced the principal speaker of the evening, Dean Ben Bogard of Louisiana Polytechnic Institute, who gave a most interesting talk on the Engineering Registration act in Louisiana. After a very lively question period, the meeting adjourned with a rising vote of thanks to the speaker.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of Alexandria Section of the Louisiana Engineering Society

A joint session was held of The Alexandria Section of The Louisiana Engineering Society and the Women's Auxillary on Thursday night, April 21st at the Alexandria Country Club. A shrimp supper was served and dancing was enjoyed. A very nice time was had by all.

It was voted that \$50.00 be allotted to the Scholarship Fund of the Women's Auxillary from the local treasury for this year.

C. W. COOK, Secretary-Treasurer

Minutes of Meeting of Baton Rouge Section Louisiana Engineering Society

Date, January 6, 1955; Time, 7:00 p.m.; Place, Bob and Jake's.

Officers present: Wiley D. Poole, president; F. G. Hornsby, 1st vice-president; Randall Meyer, 2nd vice-president; W. L. Sutton, secretary and treasurer; T. J. Innes, Jr., past president.

The meeting was called to order by Wiley D. Poole, president, and the first item on the agenda was the setting up of committees for 1955. Members of the New Orleans Committees were also selected at this time. The next item on the agenda was a discussion of a type of program to be presented during 1955. Actual plans for the February and March meetings were firmed up at this time.

A motion was made and passed to spend \$14.00 on placards and advertising material for Engineers Day.

There being no further business, the meeting was adjourned.

W. L. SUTTON, Secretary-Treasurer

Minutes of Meeting of Baton Rouge Section, Louisiana Engineering Society

Date, February 23, 1955; Time, 7:30 p.m.; Place, Louisiana State University Agricultural Engineering Auditorium.

Officers present: Wiley D. Poole, president; Randall Meyer, 2nd vice-president; W. L. Sutton, secretary and treasurer; T. J. Innes, Jr., past president; J. B. Carter, member at large.

The meeting was opened by Wiley D. Poole, president, who welcomed the guests from the American Institute of Electrical Engineers, American Institute of Chemical Engineers, and the American Institute of Industrial Engineers. Total attendance was seventy-five members and guests.

The speaker of the evening was Mr. Ernest D. Wilson, Director of the Greater Baton Rouge Port Authority. Mr. Wilson was introduced by Mr. Stuart Wiley, Manager of the Baton Rouge Port Commission. Mr. Wilson's talk was on Baton Rouge's future port and he gave a history of Baton Rouge's port operation from 1910 to the present time. Mr. Wilson discussed the fifteen million dollar bond issue that the Greater Baton Rouge Port Authority has issued and gave reports on the construction of the grain elevator, molasses storage, and general cargo docks which are scheduled to be completed this year. Mr. Wilson also discussed the number of ships that will be serviced by the grain elevator and the amount of money that will be spent in Baton Rouge as a result of the new port facilities. At the end of this meeting refreshments were served to the members and guests.

W. L. SUTTON, Secretary-Treasurer

Minutes of Meeting of Baton Rouge Section, Louisiana Engineering Society

Date, March 10, 1955; Time, 7:00 p.m.; Place, Bob and Jake's.

Officers present: Wiley D. Poole, president; F. G. Hornsey, 1st vice-president; Randall Meyer, 2nd vice-president; W. L. Sutton, secretary and treasurer; J. B. Carter, member at large.

After dinner the meeting was called to order by President Wiley D. Poole and all of the Committee Chairmen were present except Mr. C. H. Hall. Fred Hanneman gave a preliminary report on the Citizens Committee and stated that a full report would be given at the next meeting.

Plans for the annual outing were discussed and June 4 was picked as a tentative date for the annual outing. John Smiley of the Arrangements Committee was instructed by President Poole to investigate several places to hold the annual outing and at the same time to make preliminary arrangements for the December annual meeting.

Mr. Nick Carter, Chairman of the Vocational Guidance Committee, gave a report on the activities of his committee and presentations have already been made to two schools.

President Poole instructed the Secretary to make a consolidated list of all Committees to be mailed to all Committee Chairmen.

There being no further business, President Poole adjourned the meeting.

W. L. SUTTON, Secretary-Treasurer

Minutes of Meeting of Baton Rouge Section, Louisiana Engineering Society

Date, March 31, 1955; Time, 7:00 p.m.; Place, Agricultural Engineering Auditorium, L. S. U.

The meeting was called to order by President Wiley D. Poole and a short talk was given on recruiting by Tom Alexander, Chairman of the Membership Committee. The speaker for the evening was Professor McLean, Associate Professor of Electrical Engineering at L. S. U. Professor McLean gave a very interesting and practical talk on high fidelity sound equipment and a demonstration of this equipment was made by the Louisiana Radio and Television Company of Baton Rouge. There were only twenty-three members and guests present. This low attendance was due to the fact that there were numerous conflicting engagements in the city of Baton Rouge on this same evening.

W. L. SUTTON, Secretary-Treasurer

**Minutes of Meeting of the Lafayette Section, Louisiana Engineering Society,
January 18, 1955**

The January meeting of the Lafayette Section of the Louisiana Engineering Society was a dinner meeting and was held at Poor Boy's Riverside Inn at 7:30 p. m. on January 18, 1955.

After the dinner, the meeting was called to order by President Russell. President Russell called upon the members to introduce their guests.

Mr. J. A. Bonnet was called upon to report on the annual meeting of the Reorganization Committee. Mr. Bonnet reported that the committee proposed that the dues be increased in order to provide additional funds for larger section rebates and for publicizing and developing engineering activities. He also reported that the dues proposed would be \$12.00 for New Orleans Members and Affiliates, \$10.00 for State Members and Affiliates, and \$5.00 for Junior Members. The Sections are to get a 50% rebate on dues.

Mr. A. M. Bujard was called upon to present the proposed changes in Act 73 of 1950. After the proposed changes were presented the chair was turned over to Mr. Z. L. Loflin who introduced the guest speaker of the evening, Mr. Ben T. Bogard, Dean of the College of Engineering at Louisiana Polytechnic Institute. Mr. Bogard explained the proposed changes in the State Registration of Professional Engineers.

After a lively question and answer perload, Mr. Z. L. Loflin moved that we approve the first proposed change in Act 73 of 1950. The motion was seconded by Mr. C. A. Bell and carried.

Mr. R. Hetherwick moved that we approve the second proposed change in Act 73 of 1950. The motion was seconded by Mr. F. Sessums and carried.

Mr. Bogard then gave an interesting talk pertaining to the Essentiality of the Registration of Engineers.

President Russell thanked the guest speaker on behalf of the section.

President Russell announced that the week of February 20-26 would be designated as Engineers Week.

President Russell appointed the following to serve as a committee to promote Engineers Week: D. J. O'Rourke, Chairman; F. L. Larue, E. Domingue, F. Boudreaux.

Mr. R. J. Cambre moved that the section contribute \$35.00 to defray the expenses of this committee. The motion was seconded by Mr. J. E. Jarman and carried.

Mr. F. Boudreaux moved that the next meeting be a dinner meeting. The motion was seconded by Mr. R. Hetherwick and carried.

The meeting was adjourned with a rising vote of thanks to the speaker.

ALFRED W. SCHOEFFLER, Secretary-Treasurer

**Minutes of Meeting of the Lafayette Section, Louisiana Engineering Society,
February 8, 1955**

The February meeting of the Lafayette Section of the Louisiana Engineering Society was held at Poor Boy's Riverside Inn at 7:30 p.m. on February 8, 1955.

After the dinner, the meeting was called to order by President Russell.

Mr. J. E. Jarman moved that we dispense with the reading of the minutes of the January meeting. The motion was seconded by Mr. K. H. Woodward and carried.

President Russell called upon Mr. D. J. O'Rourke, chairman of the Engineer's Week Committee, who gave a report of the plans and progress of his committee.

After Mr. O'Rourke's report the chair was turned over to Mr. F. Boudreaux. Mr. Boudreaux introduced Mr. R. Mallard Seago, President of the State Section of the Louisiana Engineering Society, Mr. Wayne P. Wallace, 1st Vice-President; Waldemar S. Nelson, 2nd Vice-President; and Allan Harris, Chairman of the Membership Committee.

Mr. Seago gave a short talk about the functions and potentials of the Louisiana Engineering Society.

After Mr. Seago's talk the chair was resumed by President Russell.

There being no old business to discuss, the chair was turned over to Mr. J. E. Jarman. Mr. Jarman introduced the guest speaker of the evening Mr. Avery Carlisle, Assistant Director of the Louisiana Department of Highways. Mr. Carlisle gave an informative and interesting talk pertaining to the "Appraisal of Louisiana's Highway Needs".

After a lively question and answer period, Mr. J. E. Jarman thanked the guest speaker on behalf of the society.

There being no new business to discuss, the meeting was adjourned with a rising vote of thanks to the guest speaker.

ALFRED W. SCHOEFFLER, Secretary-Treasurer

**Minutes of Meeting of Monroe Section Louisiana Engineering Society,
March 2, 1955**

After a delicious "shrimp and oyster" supper in the Louisiana Tech Mechanical Engineering Laboratory the meeting was called to order, in the engineering library, at 8:15 p.m. by President A. P. Andrews.

Dean Ben T. Bogard was introduced who welcomed the group to the Tech campus and invited the Louisiana Engineering Society to attend "Engineer's Day" at Tech on April 2, 1955.

Guests and new members were introduced by the individual members who brought them. There were a total of twenty-four guests, new members and applicants. A roll call was made with the member answering by giving the company he represented.

The minutes of the December 7, 1954, meeting were read and approved.

Committee reports were as follows:

Membership—Henry Poulan, Chairman. Reported that several applicants were being processed at the present time and that more applications had been passed out at this meeting. The members of this committee were named for the benefit of all present.

Publicity—John Huffman, Chairman. Requested that all who had anything of interest to report please do so to any of his committee.

National Engineer's Week—A. C. Thigpen, Chairman. Reported on the work done by his committee and the publicity given "National Engineers' Week." Reported on the television program on KNOE-TV and the convocation on the Tech campus.

The secretary read a letter from R. L. Ropp, President of Louisiana Polytechnic Institute to A. P. Andrews, President of Monroe Section LES extending a cordial invitation to the LES to the Tech campus and expressing his appreciation for being asked to be on the KNOE-TV Jaycee Roundtable.

President Andrew reported that results of the letter ballot on the new engineering law indicated that a majority were in favor of the changes and that this information had been passed on to the Louisiana Engineering Council.

President Andrews then introduced Mr. H. Lehman, Chief of the Highway Department Testing Laboratories at Baton Rouge. Mr. Lehman then presented the guest speaker, Mr. Grady Carlisle, Assistant to the Director of Highways in Louisiana.

Mr. Carlisle gave a very informative discussion of the "Appraisal of Highway Needs in Louisiana" which dealt with "Highway Classification," "Actual Costs of Needs" and "Programming".

Mr. Carlisle led an interesting question and answer period after his talk.

President Andrews announced that the next meeting would be held on the first Tuesday in June.

Motion to adjourn was made by Mr. Strole and seconded by Mr. Gill.

Meeting adjourned at 9:45 p.m.

C. L. DENSON, Secretary-Treasurer

MEMBERSHIP LIST

C. M.—Charter Member
 H. M.—Honorary Member
 L. M.—Life Member
 A.—Affiliate Member
 J.—Junior Member

C. E.—Civil Engineer
 Ch. E.—Chemical Engineer
 E. E.—Electrical Engineer
 M. E.—Mechanical Engineer
 R.—Registered, La.

A

- ALFRED E. ABAUNZA, (1938), C. E. R., Ajax Machine Works. 3133 Tchoupitoulas St., New Orleans 15.
 HENRY G. ABBOTT, (1925), Ch. E., Esso Standard Oil Co., 1104 Elizabeth Ave., Elizabeth, N. J.
 MACK ABRAHAM, (1948), M. E., R. Cities Service Refining Corp. Butadiene Plant, Lake Charles, La.
 CARL E. ABRAHAMSON, (1940), C. E., R., La. Dept. of Hwys., P. O. Box 1002, Baton Rouge 1.
 NILS C. C. ABRAHAMSON, (1944), C. E., Department of Hwys., P. O. Box 1002, Baton Rouge 1.
 MICHAEL C. ABRAHM, (1936), M. E., E. E. R., New Orleans Public Service Inc., 317 Baronne Ct., New Orleans 9.
 AARON ABRAMSON, (1946), M. E., Ch. E., R., Petrolane Gas Co., Inc., P. O. Box 4067, Sta. F., New Orleans 18.
 FARRELL W. ADAMS, (1948), M. E., R., United Gas Corp., Box 1601, Monroe, La.
 FRED R. ADAMS, (1940), E. E., R., Southern Bell Tel. and Tel. Co. 304 Iris St., Lake Charles.
 GEORGE C. ADAMS (J), (1953), M. E., R., R. J. Jones & Sons, P. O. Box 991, Alexandria, La.
 SAMUEL L. ADAMS, (1954), E. E. R. Texas Gulf States Utilities Co., Baton Rouge, La.
 JERRY W. AFFOLTER, JR., (1952), Ch. E., Esso Standard Oil Co., 745 Parlange Drive, Baton Rouge 6.
 FELIX L. ALCUS, (1922), (L.M.), M. E., E. E., R., self employed. 219 Pan American Bldg., New Orleans 12.
 LEWIS SCHERCK ALCUS (L. M.), (1923), M. E., R., 474 Audubon St., New Orleans 18.
 ALBERT M. ALEXANDER, (1944), C. E., R. La., Miss., Consulting Engineer, 201 Nola Bldg., New Orleans 12.
 MILLER H. ALEXANDER, (1950), M. E. and Hydraulic E., R., American Rice Growers. 904 Kirby St., Lake Charles.
 TOM E. ALEXANDER, (1946), M. E., E. E., R. Crane Packing Co., 644 Carol Marie Drive, Baton Rouge.
 JOHN W. ALLEE, (J), (1948), C. E., B. M. Dornblatt & Associates, 119 Elvis Court, New Orleans 20.
 HUNTER S. ALLEN, (A), (1948), C. E., R. Black Rogers & Co 304 La. Nat. Bank Bldg., Baton Rouge.
 JACK W. ALLEN, (1949), M. E., E. E., R., The Celotex Corp. 236 Ridgewood Drive, New Orleans 20.
 JAMES E. ALLEN, (J), (1949), C. E., A. The Allen Const. Co., Box 3044, Shreveport, La.
 ROBERT D. ALLEN, (1947), M. E., R., Gulf Engineering Co., 1000 S. Peters St., New Orleans 13.
 WINFIELD W. ALSUP, (1949), C. E., R., J. B. Beaird Co., P. O. Box 1115, Shreveport, La.
 ROBERT W. AMMON, (1951), M. E., Esso Standard Oil Co., 833 Geranium St., Baton Rouge, La.
 WALTER J. AMOSS, (1943), C. E., Valentine Sugars Co. 1571 Henry Clay Ave., New Orleans 18.
 NATHAN L. ANDERSON, (J), (1951), M. E., Kaiser Aluminum & Chemical Corp., Rt. 1, Box 158, Chalmette, La.

- HERMAN M. ANDREAS, (1951), Texas-Bitulithic Co. Box 8044, New Orleans 22.
- ALVIN P. ANDREWS, (1947), Surveyor, C.E., R., Dept. of Public Works. P. O. Box 1206, Monroe, La.
- PHILIP P. ANGIER, (1942), C. E. R., La. Dept. of Highways, Rt. 5, Box 286, Shreveport, La.
- LESTER H. ARBO, JR., (J), (1954), C.E., 1019 Bellecastle St., New Orleans.
- JULIUS B. ARBOUR, (J), (1947, M. E., Esso Standard Oil Co. of N. J., La. Div. 2952 Belmont Ave., Baton Rouge, La.
- AUSTIN P. ARDOIN, (J), (1950), E. E., Southern Bell Tel. Co., 3903 Jande St., Lake Charles, La.
- ROBERT L. ARGUS, (1938), M. E., R., Pan-Am Southern Corp., Destrehan, La.
- WILBERT L. ARGUS, (1938), C.E., R., Alumaglass Bldg. Products Inc., 223 N. Carrollton Ave., New Orleans.
- HENRY G. ARMATIS, (1953), C.E., M.E., R., La., Neb. Welding & Mfg. Co., 3650 Fairmont Drive, New Orleans, La.
- M. GEORGE ARNETT, (1950), M. and E.E., R., Central La. Electric Co., P. O. Box 1096, Lafayette, La.
- ALANSON J. ARNOLD, (J), (1948), M.E., R. American Radiator and Standard Sanitary Corp. 1933 Wilton Drive, New Orleans 22.
- CLIFTON J. ARNOLD, (1955), E.E., Kaiser Aluminum & Chem. Co., Chalmette, La.
- VERNON W. ASHWORTH, (J), (1953), M.E., R., Active Duty USAF, 2549 Drexel St., Shreveport.
- BEN D. ATCHLEY, SR., (J), (1951), C.E., R., City of Shreveport. 1830 Jenkins St., Shreveport.
- OREN H. ATKINS, (1953), M.E., E.E., R., Pogue-Atkins Co., Inc. 502 Austin Ave., W. Monroe, La.
- JAMES G. ATTEBERRY, (J), (1950), C.E., R., Gulf Oil Co. 336 W. Laurel St., Eunice, La.
- WILLIAM W. AYER, JR., (1953), Pet.E., R., Citiles Service Refining Corp., 161 Mustang St., Sulphur, La.
- SAUNDERS AYMOND, (A), (1951), (C.E.), Draftsman, Pan-American Engineers, 1022 Tenth St., Alexandria, La.

B

- BENTON P. BABIN, (1945), E. E. ,R., Westinghouse Electric Corp., 1241 N. Rampart St., New Orleans 16.
- LIONEL J. BABIN, JR., (J), (1948), M.E., B & M Corp. P. O. Box 6, Houma, La.
- WILLIAM M. BABINGTON, JR., (J), (1954), M.E., Gaylord Container Corp., 911 Mississippi Ave., Bogalusa, La.
- FRED J. BAEHR, JR., (J), (1953), M.E., R., N. O. Public Service Inc. 1600 So. Peters St., New Orleans 13.
- JEROME C. BAEHR, (1931), C.E., R., U. S. Engineer Corps, New Orleans District, 7407 St. Charles Ave., New Orleans 18.
- RAYMOND V. BAILEY, (1954), Ch.E., R., Tulane University, New Orleans 18.
- ROBERT E. BAILEY, (J), (1954), M.E., Box 75, Rt. 2, Bogalusa, La.
- JOE M. BAKER, (1948), Production Supt., Union Sulphur Co., 3819 Drake St., Houston 5, Texas.
- OREN BAKER, (1951), C.E., R., La. Dept. of Highways, Box 872, Alexandria, La.
- JOSEPH L. BALCH, (J), (1950), E.E., address unknown.
- SAMUEL L. BALENTINE, (J), (1954). Howard L'Heureux, Consulting Engrs. 322 Carl St., Alexandria.
- ROBERT A. BANCK, (1953), M.E., R. Mich., Riley-Stoker Corp. 504 Pan American Bldg., New Orleans 12.
- FRED N. BANKER, (A), (1950), Telephone Eng., Gonzales Telephone Exchange, Box 36, Gonzales, La.
- WARREN K. BANKSTON, (1948), M.E., N. O. Public Service Inc., 5958 Argonne St., New Orleans 24.
- PAUL M. BARBER, (1951), Surveyor. 3541 N. Market St., Shreveport.

- CHARLES C. BARNARD, (1937, C. E., R., Barnard & Burk, 1023 Nicholson Dr., Baton Rouge, La.
- CHARLES P. BARNARD (J), (1954), C. E., R., Barnard & Burk, Box 268, Baton Rouge.
- BEN BARNES, (A), (1944), C. E., R., Dept. of Highways, 110 Germantown Road, Minden, La.
- ROBERT LELAND BARNES, (1942), C. E., R., La. Dept. of Highways, Fordoche, La.
- VAN A. BARNETT, (1949), C. E., R., Consulting Engineer, Private Practice, 214 Simon Bldg., Shreveport, La.
- JOSEPH H. BARNWELL, (1951), M. E., R., Gen'l Electric Co., 2925 Halsey Dr., Schenectady 4, N. Y.
- WILLIAM A. BARNWELL, JR., (J), (1951), Ch. E., Dow Chemical Corp., Box 91, Lake Jackson, Tex.
- WILLIAM C. BARNWELL, (1949), M. and E. E., R., Gaylord Container Corp., 823 N. Border Dr., Bogalusa, La.
- HAROLD T. BARR, (1947), Agricultural E., R., Agricultural Experiment Station L.S.U., 409 Cornell Ave., Baton Rouge.
- OTHA E. BARRON, (1951), E. E., R., Southern Bell Tel. & Tel. Co. 825 Murray St. Alexandria.
- OTHA E. BARRON, JR., (1952), E. E., Robbins & Meyers, Inc., 6731 General Diaz St., New Orleans 19.
- ROBERT H. BARTHOLOMEW, (1948), Ch. E., Shell Oil Co., Inc., Norco, La.
- ANTHONY J. BARTLETT, (1954), E. E., R., N. O. Public Service Inc., 1600 S. Peters St., New Orleans 13.
- Z. W. BARTLETT, (1949), Mining E., R. La., Tex., Freeport Sulphur Co., 1904 American Bk. Bldg., New Orleans 5.
- JOHN C. BARTLEY, (1940), C. E., R., Bartley & Binnings, 433 Gravier St., New Orleans 12.
- RAYMOND P. BASSICH, (A), (1929), N. O. Blue Print & Supply Co., Inc. 824 Union St., New Orleans 12.
- AYLMER P. BATCHELOR, (1952), M. E., R., United Gas Pipe Line Co. 940 Oakley Drive, Shreveport, La.
- JOHANNA O. BAUMAN, (A), (1947), Gulf States Utilities Co. 3126 Monroe Ave., Baton Rouge.
- GROVER C. BAYLES, (1955), Elliot Co., 256 Lee Circle Bldg., New Orleans 13.
- CLAYTON M. BEAMER, (1945), Ch. E., Esso Standard Oil Co., 15 West 51st St., New York 19, N. Y.
- THOMAS M. BEAMON, (1954), Ch. E., Esso Standard Oil Co., Baton Rouge, La.
- THELBERT C. BEASLEY, (1954), M. E. Mayor, City of Ruston, P. O. Box 485, Ruston, La.
- HAL C. BECKER, (1953), E. E., R., Tulane University School of Medicine, 1430 Tulane Ave., New Orleans 12.
- RICHARD O. BECKHAM, JR., (1955), E. E., R., Southern Bell Tel. & Tel. Co., 209 Gen'l Gardner St., Lafayette, La.
- WILLIAM K. BECNEL, (1941), C. E., R., Bedell & Nelson, 2702 Manley Ave., New Orleans 20.
- JOHN G. BEDELL, (1946), C. E., V. J. Bedell Co. 840 Union St., N. O. 12.
- VICTOR J. BEDELL, (1936), C. E., R. La., Ark., Miss., Bedell & Nelson. 840 Union St., New Orleans 12.
- ELLIS L. BEGNAUD, (J), (1951), E. E., L. F. Gaubert & Co., 724 Aline St., New Orleans 15.
- ALEXANDER B. BELL, (J), (1950), Communications E., Southern Bell Tel. & Tel. Co., General Delivery, Broussard, La.
- BEN H. BELL, (L.M.), (1920), E. E., R., New Orleans Public Service Inc. 4604 S. Derbigny St., New Orleans 15.
- CHARLES A. BELL, (1954), C. E., R., La. Dept. Public Works, P. O. Box 377, Lafayette, La.
- PHILIP L. BENFIELD, (J), (1952), Agri. E., Agricultural Eng. Bldg., L.S.U., Baton Rouge, La.
- R. F. A. BENSON, (1938), M. E., Gulf Refining Co. 4480 Arts St., New Orleans 22.
- JOSEPH H. BENTON, (1954), C. E., Esso Standard Oil Co., 1897 Blouin Ave., Baton Rouge, La.

- CHAILLE CLAUDE BERNARD, (1943), C. E., R., La., Miss., La. Dept. of Highways. 2040 Oleander St., Baton Rouge 6.
- JOHN H. BERNHARD, (L.M.), (1921), Consulting E., 1728 N. Third St., Clinton, Iowa.
- CHESTER R. BEST, (1952), E. E., R., College of Eng., La. State University, Baton Rouge, La.
- ALLEN W. BETZ, (1945), Ch. E., R., Betz Engineering Sales Co. 6 Wavertree Court, New Orleans 20.
- MALCOLM L. BIENVENU, (J), (1949), E. E., address unknown.
- CECIL W. BIGGS, (1949), C. E., Tellepson Const. Co., Route 4, Winnsboro, La.
- ARTHUR E. BIGLER, (1946), E. E., R., La. Power & Light Co. 353 Soniat Ave., Harahan, La.
- F. N. BILLINGSLEY, (L.M.), (1915), C. E., E. E., M. E., R., La., Ala., Billingsley Engineering Corp., 2122 Jefferson Ave., New Orleans 15.
- ROGER BISSINGER, (J), (1952), E. E., R., Electrical Sales Co., 2413 Pine St., New Orleans 18.
- CHARLES BITTENBRING, III, (1940), C. E., R., U. S. Navy, Hq. Support Activities, Navy No. 510, F.P.O., New York.
- F. B. BLACKSTONE, (1944), M. E., R., Freeport Sulphur Co., Port Sulphur, La.
- HUGH M. BLAIN, JR., (1941), M. and Ch. E., R., New Orleans Public Service Inc. 527 Magnolia St., New Orleans 13.
- GLEN P. BLANCHARD, (1949), M. E., C. B. Construction Co. 4633 Underwood Ave., Baton Rouge.
- LEE J. BLANCHARD, JR., (J), M. E., 103 Maurice St., Lafayette, La.
- JOHN G. BLANCHE, (1949), M. E., R., L.S.U., 3239 Morning Glory Ave., Baton Rouge, La.
- ROBERT F. BLAND, (J), (1948), C. E., R., R. P. Farnsworth & Co. 1626 Napoleon Ave., New Orleans 15.
- WALTER E. BLESSEY, (1943), C. E., R., College of Engineering, Tulane University, New Orleans 18.
- ALBERT R. BOELTE, (1937), C. E., R., Board of Commissioners, Port of New Orleans. 5624 Canal Blvd., New Orleans 24.
- J. EDWIN BOELTE, (A), (1945), M. E., E. E., R., Sperry Gyroscope Co., Inc. 19 Maryland Drive, New Orleans 20.
- BEN T. BOGARD, (1949), M. E., R., La. Polytechnic Institute. 36 University Drive, Ruston, La.
- HENRY BOH, (1949), C. E., Boh Brothers Construction Co. 2400 Cypress St., New Orleans.
- PHILIP W. BOHNE, (1950), Ch. E., R., Kaiser Aluminum & Chem. Corp., 21-A Fontainebleau Dr., New Orleans.
- WILLIAM H. BOHNE, (1940), C. E., R., R. P. Farnsworth Co. 1520 Dufossat St., New Orleans, La.
- EARL G. BOND, (J), (1952), E. E., General Electric Co. 713 Griffith Ave., Owensboro, Ky.
- THOMAS A. BONNET, (1950), E. E., R., Central La. Electric Co. 625 St. Louis St., Lafayette, La.
- JAMES H. BOOKSH, JR., (1950), C. E., R. United Gas Corp., 105 Lewis St., New Iberia, La.
- W. RAY BOOTH, (J), (1949), Ch. E., R., Colin Gas Transmission Corp., Box 531, Opelousas, La.
- HENRY BORDELON, (1951), Engineering Aide, City of Alexandria, City Hall, Alexandria, La.
- LEONARD H. BOSSIER, (1955), M. E., R., L. H. Bossier, Contractor, 212 Maryland Ave., Alexandria.
- CONRAD O. BOSTROM, (J), (1947), C. E., R., Bartley & Binnings. 1783 Coliseum St., Apt. 28, New Orleans.
- CLARENCE N. BOTT, (1927), C. E., R., 2551 Metairie Rd., New Orleans.
- FELIX J. BOUDREAUX, (1950), E. E., Southwestern La. Institute. Box 503, S.L.I., Lafayette, La.
- HAMILTON J. BOUDREAUX, JR., (1941), M. E., R., Godchaux Sugars, Inc. Box 422, Reserve, La.
- PAUL C. BOUDREAUX, (1954), C. E., Arch., R., 1752 Spain Street, Baton Rouge.
- JAMES B. BOULET, (J), (1954), E. E., Citiles Service Refining Corp., Butadiene Plant. 1509 Shaw St., Lake Charles.

- TRUMAN A. BOURGEOIS, (J), (1950), M. E., R., Braun Construction Co. 5213 Claycut Road, Baton Rouge, La.
- ROSCOE H. BOWERS, (1946), E. E., R., Mass., American Forest Products Corp., 461 Mayfield Drive, Centerville, Calif.
- JAMES A. BOX, JR., (1949), Ch. E., Gaylord Container Corp., Box 647, Bogalusa, La.
- CLIFTON C. BOYD, (1950), Agricultural E., Portland Cement Ass'n. 504 Cole Ave., Monroe, La.
- AUBRA A. BRADDOCK, (A), (1951), C. E., R., La. Department of Highways, Box 345, Columbia, La.
- CHARLES A. BRAGG, (A), (1954), C. E., Eustis Engineering Co., 3635 Airline Highway, New Orleans 20.
- WILLIAM G. BRANCH, (1949), C. E., La. Dept. of Highways, 2043 Perkins Road, Baton Rouge, La.
- SHIRLEY C. BRASELMAN, (L. M.), (1919), American Creosote Works, 1305 Dublin St., New Orleans 18.
- VAL D. BREAUX, JR., (J), (1949), C. E., C. F. Braun Co., Gueydan, La.
- GRADY L. BREECE, (1945), M. E., R., McWilliams Dredging Co. P. O. Box 584, New Orleans 7.
- JOHN O'R. BREEDEN, (J), (1949), M. E., R., Lamatt Agency, Inc., 534 Homestead Ave., New Orleans 20.
- EDWARD S. BRES, (H. M.), (1925), C. E., R. Major General U.S.A. (Retired). 5325 38th St., N.W., Washington 15, D. C.
- RICHARD H. BRETZ, (1949), Ch. E., Esso Standard Oil Co. 1365 Thibodaux Ave., Baton Rouge.
- BARNET BREZNER, (1944, C. E., R. La. and Mich., Private practice. P. O. Drawer 1030, Alexandria, La.
- ERNEST N. BRODNAX, (A), (1944), C. E., Surveyor, R., La. Dept. of Highways, 502 McCreight St., Bastrop, La.
- A. W. BRODTMAN, (1938), C. E., R., C. B. Spencer Co., Inc., 944 Bragg St., New Orleans 24.
- AUGUST J. BRODTMANN, (1936), Ch. E., N. O. Public Service Inc. 317 Baronne St., New Orleans 9.
- V. HUBERT BROGDON, (1947), M. E., R., Freeport Sulphur Co., Port Sulphur, La.
- DUGAL A. BROOKS, (1953), Mining E., R., La., Tex. Freeport Sulphur Co. P. O. Box 727, Port Sulphur, La.
- ROBERT TERYL BROOKS, (1942), C. E., R., Dept. of Highways. Box 232, Hammond, La.
- AMABE J. BROUILLETTE, (J), (1952), La. Dept. Public Works. 63 Shannon Rd., Alexandria.
- FREDERICK D. BROUSSARD, (1953), E. E., Esso Standard Oil Co. (La. Div.), Baton Rouge, La.
- OLIVIER BROUSSARD, III, (J), (1950), C. E., R., La. Dept. of Highways. Box 481, Westlake, La.
- A. RINGGOLD BROUSSEAU, (1935), Engineer of Mines, Manufacturer's Representative. P.O. Box 5276, New Orleans 15.
- CHARLES DONALD BROWN, (1950), C. E., R., La. Dept. of Highways. 1265 S. Market St., Opelousas, La.
- HARWOOD I. BROWN, (1948), M. and E. E., R. Private Practice. 319 Warrington Dr., New Orleans 22.
- HENRY NEWTON BROWN, (1948), C. E., R., La. Dept. of Highways. P. O. Box 260, Shreveport, La.
- JAMES WESLEY BROWN, (1950), C. E., R. Miss., State of California, 206 Warrington Drive, New Orleans.
- JOHN A. BROWN, (1949), C. E., R., La. Dept. of Highways. 2375 Myrtle Ave., Baton Rouge, La.
- VERNON M. BROWN, (J), (1948), M. E., Columbia Southern Chemical Corp. 1324 Rosetta St., Lake Charles, La.
- WALTER BROWN, (1952), M. E., R., La., Ohio, Tex. 917 Kirby Place, Shreveport, La.
- JOHN H. BROWNE, JR., (1954), M. E., R., Columbian Carbon Co., P. O. Drawer 1562, Monroe, La.
- FRED C. BROWNLEE, (1953), M. E., R., M. Kaplan & Son, Inc. P. O. Box 183, Monroe, La.

- JOHN S. BROYLES, (1949), C. E., R., Texas. United Gas Pipe Line Co. P. O. Box 1407, Shreveport, La.
- THOMAS S. BROYLES, (1954), C. E., Texas Bitulithic Co., Box 8044, New Orleans 22.
- ROBERT N. BRUCE, JR., (J), C. E., R., Raymond Concrete Pile Co., 502 Pine St., New Orleans 18.
- LAWRENCE C. BRUNE, (1933), M. and E. E., U. S. Engineer Corps, New Orleans District, 4625 Spain St., New Orleans 17.
- T. C. BRUNS, (1940), C. E., R., Bruns Bridge Co., Whitney Bldg., New Orleans 12.
- MARION C. BUBENZER, (1952), Petroleum E., R., La. Tex. Southwest Natural Gas Co. 636 Rutherford St., Shreveport, La.
- LOUIS M. BUJA, (1922), C. E., R., City of New Orleans, Room 304 City Hall, New Orleans 12, La.
- A. M. BUJARD, (1950), M. E. and E. E., R., United Gas Corp., New Iberia, La.
- ROBERT J. BUJOL, (1954), Ch. E., Esso Standard Oil Co., 810 Rittiner Drive, Baton Rouge.
- DEWEY E. BURCHETT, (1952), C. E., R., Bossier Parish Police Jury, Benton La.
- WILLIAM A. BURFORD, JR., (J), (1951), C. E., R., International Paper Co. 704 Belleview St., Moss Point, Miss.
- RAY E. BURGESS, (1945), C. E., R., La., Tex. Cities Service Refining Corp. 3939 Ryan St., Lake Charles, La.
- RAY WESLEY BURGESS, (1948), C. E. and M. E., R., Stone and Webster Engineering Corp. 4822 Mohican St., Baton Rouge, La.
- ERNEST A. BURGUIERES, JR., (1954), M. E., La. Ernest Burguires & Co., Apartado 90, Managua, Nicaragua, C. A.
- JACK S. BURK, (1944), C. E., R., Barnard and Burk, Consulting Engineers, Box 268, Baton Rouge 1.
- JOHN S. BURKE, (1946), Heating and Ventilating E., R., N. O. Public Service Inc. 317 Baronne St., New Orleans 9, La.
- PEARL PIERCE BURKE (MRS.), (1950), Geologist, U. S. Corps of Engineers. 1839 S. Carrollton Ave., New Orleans 18.
- DANIEL F. BURKHALTER, JR., (J), (1954), E. E., R., Self Employed, 414 Louisville St., Monroe, La.
- JOHN O. BURNETT, (1944), C. E., Burnett & Lambert, Box 386, Denham Springs, La.
- RICHMOND S. BURNSIDE, JR., (J), (1949), C. E., R., Shell Oil Co., 910 S. Carrollton Ave., New Orleans 18.
- CHARLES A. BURTON, (1945), M. E., Monsanto Chemical Co., Texas City, Texas.
- HENRY WM. BUSCH, (1950), E. E., R., Mike Baker Brick Co. P. O. Box 1209, Oil Center, Lafayette, La.
- HENRY G. BUSE, (1953), E. E., R., Self Employed, Balter Bldg., New Orleans 12.
- SOULE BUTLER, (1945), C. E., City of Alexandria, City Hall, Alexandria, La.
- WALTER C. BYRNE, JR., (1947), M. and E. E., Motorola, Inc. 5354 W. Madison St., Chicago, Ill.

C

- RALPH CAFFERY, (J), (1949), C. E., R. Tex. Gulf Oil Corp., 1708 Kipling St., Liberty, Tex.
- JOHN D. CALHOUN, (1950), M. E., R., La. Polytechnic Institute. Box 307. Tech Station, Ruston, La.
- ROBERT L. CALHOUN, (J), (1952), E. E., Southern Bell Tel. & Tel. Co., Rt. 1, Boyce, La.
- SEYMOUR CAMBIAS, JR., (1946), E. E., New Orleans Public Service Inc., 1606 Charleton Drive, New Orleans 22.
- PRUDENT B. CAMBRE, (1954), M. E., The Texas Pipe Line Co., 509 W. St. Joseph St., Lafayette.
- ROLAND J. CAMBRE, (1952), M. E. Southwestern Louisiana Institute. Box 115, S.L.I., Lafayette, La.
- SALVADOR J. CAMPAGNA, (J), (1949), M. E., R., Kaiser Aluminum & Chemical Corp., Rt. 1, Box 368, Chalmette, La.

- PHILIP H. CAMPBELL, (1926), C.E. Union Industrial & Astilleros Barranquilla. Apartado Aero No. 319, Barranquilla, Colombia, S. A.
- KOHLMAN CAMPELL, (1949), Ch. E., R., International Lubricant Corp. 117 Melody Drive, New Orleans 20, La.
- HALSEL A. CANAVIER, (A), (1952), M.E. Ebasco Services Inc. 638 Sizeler Ave., New Orleans 21.
- GEORGE S. CANNON, (J), (1949), E. E., R., Tex. Gulf States Utilities Co. 1120 Water St., Navasota, Texas.
- C. GLENN CAPPEL (H. M.), (L. M.), (1915), C. E., R. La. and Texas. W. Horace Williams Co. 833 Howard Ave., New Orleans.
- ROY GLENN CAPPEL, (1948), C.E., R., La., Ala., Horace Williams Co. 833 Howard Ave., New Orleans.
- THORNTON L. CAPPEL, JR., (1951), E. E., Standard Oil Co. 2026 Avondale St., Baton Rouge.
- M. H. CARAWAY, (A), (1947), Quantity Surveyor. M. H. Caraway Co. 2723 S. Broad Ave., New Orleans 15.
- FRANK C. CAREY, (1943), C. E., U.S. Corps of Engineers, East Atlantic Dist., A.P.O. 30, USAF, c/o Postmaster, N. Y.
- MARSDEN B. CARMICHAEL, (1952), M.E., Esso Standard Oil Co. 4311 Hyacinth Ave., Baton Rouge, La.
- S. STEVE CARNEGIE, (1940), C.E., R. Carnegie & Smith, 3009-A Dalrymple Drive, Baton Rouge 13, La.
- J. B. CARTER, (1939), C. E., R. La. Dept. of Highways. 302 Amherst Ave., Baton Rouge 14.
- JAMES LEWIS CARTER, (1949), C. E., R. La., Tex. Southwest Gas Production Co., Inc., 607 South 4th St., West Monroe, La.
- WILLIAM H. CARTER, (1939), Agricultural E. La. State University. 113 Atkinson Hall, University Station, Baton Rouge, La.
- GERARD P. CARUSO, (1948), Ch. E., R. International Lubricant Corp. 3709 Dumaine St., New Orleans 19.
- DAVID J. CARVILLE, (1950), M. E., R. Barnard & Burk, 1023 Nicholson Drive, Baton Rouge, La.
- JULES A. CARVILLE, JR., (1948), E. E., R., Tex. Shell Oil Co., Norco, La.
- CHARLES E. CASSAGNE, JR., (1937), C. E., R. Miss. River Bridge Authority, New Orleans 12.
- N. S. CATCHINGS, (1939), C. E., R., Miss., La. Metal Culvert Co. Box 2427, Baton Rouge, La.
- D. B. H. CHAFFE, JR., (L. M.), (1920), M. & E. E. Southern States Equipment Co. 425 Celeste St., New Orleans 11.
- HENRY G. CHALKLEY, (1948), M.E. Captain, U.S.N.R. Box 558, Lake Charles, La.
- A. E. CHAMPEAU, (1943), Marine E. Koch Ellis Marine Contractors, Inc., P. O. Box 481, Kenner, La.
- HOWARD CHANEY, (1950), Marine Engineer. Gulf States Utilities Co. 3105 Washington Ave., Baton Rouge, La.
- A. WATSON CHAPMAN, (1945), Ch. E. Celotex Corp. 1211 N. Lasalle St., Chicago 10, Ill.
- HOMER T. CHAPMAN, (A), (1952), M.E. Matheison Chemical Corp. Rt. 1, Box 438, Lake Charles, La.
- ROBERT R. CHAPMAN, (J), (1949), M.E., Lake Arthur Machine Shop, Box 386, Lake Arthur, La.
- ROBERT E. CHAPPUIS, (1950), M.E., Central La. Electric Co. P. O. Box 112, Baldwin, La.
- FREDERICK E. CHARLES, (1950), Ch. E. Cities Service Refining Corp. 26 Poinsettia Road, Maplewood, La.
- FREDERIC M. CHATRY, (1949), E. E. U.S. Engr. Corps, N. O. District. 4653 Gaines St., New Orleans 22.
- THEO. T. CHENET, (L.M.), (1923), C. E., R., Dept. of Highways, 707 Eleventh St., Lake Charles, La.
- ROGER E. CHESNUT, (1944), M.E., Private Practice, Rt. 1, Box 191, Picayune, Miss.
- WOODROW W. CHEW, (1954), Ch. E., R., Louisiana Polytechnic Institute. Box 36, Tech Station, Ruston, La.
- LLOYD E. CHIASSON, (J), (1954), E. E. Address unknown.
- CLYDE S. CHILDERS, (A), (1952), Estimator, Matheison Chemical Corp., P.O. Box 334, Orange, Tex.

- ROY P. CHILDRESS, (J), (1954), C.E., R. Chicago Bridge & Iron Co., P. O. Box 2567, Houston 21, Texas.
- A. R. CHOPPIN, (1948), Ch. E., R. La. State University., Baton Rouge, La.
- LOUIS C. CHRISTIAN, JR., (1950), E.E., R. Gulf States Utilities Co., Box 2431, Baton Rouge, La.
- J. GALE CHUMLEY, (1949), M.E., La. Polytechnic Institute. 126 Calvin St., Ruston, La.
- BYRON E. CLARK (A), (1951), C.E., R. La. Dept. of Highways. 120 Reynolds St., New Iberia, La.
- CARROLL A. CLARK, (J), (1952), C.E., U. S. Navy. Address unknown.
- RUSSELL S. CLARK, (1948), M.E., R. Ohio. Southern Alkali Corp. 216 Wilson Ave., Lake Charles, La.
- THOMAS D. CLARK, JR., (J), (1951), M.E. Southwestern La. Institute. Box 144, S.L.I. Station, Lafayette, La.
- F. T. CLARKE, (1942), C.E., R., La., Tex. Union Sulphur & Oil Co., Inc. Bank of Commerce Bldg., Houston 2, Texas.
- VERNE CLAWSON, (1950), Ebasco Services, Inc. 6129 Vicksburg St., New Orleans 19.
- JESSE COATES, (1953), Ch. E., R., Louisiana State University. 2320 Terrace Ave., Baton Rouge.
- C. M. COCKRELL, (1945), M.E., R., La., Texas. Freeport Sulphur Co., 6539 Gen. Diaz St., New Orleans, La.
- AUBREY G. CODE, (1933), C.E., M.E., E.E., R., La. and Texas. Curtis and Davis. 4936 Mandeville St., New Orleans 22.
- GERARD O. COIGNET, (1947), E.E., C.E., R., Louisiana Geological Survey. 610 University Walk, Baton Rouge.
- TOM F. COLBERT, (1942), C.E., R. La. Dept. of Highways, P. O. Box 523, Alexandria, La.
- JULIUS W. COLE, (1950), C.E., R., Winkler Mfg. Co. 818 North Blvd., Baton Rouge.
- AUBIN J. COLEMAN, JR., (J), (1953), E.E. General Electric Co. Drawer 352, Morgan City, La.
- JAMES HOWARD COLLINS, (1929), M. and E.E., R., Ebasco Services Inc. 1310 Short St., New Orleans 18.
- JEFFREY H. COLLINS, SR., (1943), M.E., R., New Orleans Public Service Inc. 317 Baronne St., New Orleans 9.
- RALPH E. COMPAGNO, (J), (1947), C.E., R., U.S. Naval Construction Battalion Center. 2152 Halls Mill Rd., Mobile, Ala.
- RUSSELL G. CONE, (1949), C.E., R. Silas Mason Co., Box 1162, Shreveport, La.
- GEORGE M. CONNELL, (A), (1952), C. E. Central Culvert Corp., P.O. Box 9, Alexandria, La.
- JOHNSON S. CONNER, (1952), E. E. La. State University. 477 W. McKinley St., Baton Rouge, La.
- FRED A. CONSTERDINE, (1950), C.E., R., La. Dept. of Highways. 100 Highland St., Lafayette, La.
- JOSEPH E. CONVERSE, (L.M.), (1921)), C.E., R. National Bureau, Ala., Fla., Ga., Miss., La. and Texas. J. B. Converse & Co., 106 Joseph St., Mobile 6, Ala.
- CHARLES W. COOK, (1950), C.E., M.E., E.E., R. La., Tex. City of Alexandria. City Hall, Alexandria, La.
- WALTER COOKE, (1954), M.E., E.E., R., Private Practice. Suite 305, 816 Howard Avenue, New Orleans 12.
- ALVA LEE COOPER, (J), (1949), E.E., General Electric Co. 121 Cornwall Ave., Utica, N. Y.
- ROBERT COOPER, JR., (A), (1952), C.E., R., La. Dept. of Highways. P. O. Box 754, Hammond, La.
- CLARENCE E. COPELAND, (1950), Senior Inspector, United Gas Pipe Line Co., P. O. Box 1407, Shreveport 92, La.
- STEPHEN H. CORDILL, (1949), Petroleum E. Union Sulphur Co. Route 2, Box 24, Sulphur, La.
- GLEN LEE CORRIGAN, (1949), Petroleum E., R. La., Texas, Okla. Louisiana Polytechnic Institute. Tech Station, Ruston, La.
- HILTON I. COTTEN, JR., (1954), Ch.E., R., Freeport Sulphur Co., Port Sulphur, La.

- FRANK HUGH COUGHLIN, (1945), C. E., M. E., E. E., R., La. Texas, Central La. Electric Co. Box 111, Alexandria, La.
- JOHN C. COURTNEY, (1954), C. E., R., La. Dept. of Highways. 2771 Amherst St., Shreveport.
- JOSEPH FRANK COURTNEY, (1937), Research & Mech. Engr. International Harvester Co. 1403 Louisiana Ave., New Orleans 15.
- EDWIN R. COUSINS, (1944), Ch. E., R. Southern Regional Research Laboratory. 120 Hathaway Place, New Orleans 19.
- GEORGE S. COVERT, (1947), C. E., R. La., Miss., La. Dept. of Highways. 2772 July St., Baton Rouge.
- JOHN E. COYNE, C. E., R., Coyne Construction & Engineering Co. 201 Richard St., Gretna, La.
- WILLIAM O. CRABTREE, (J), (1955), C. E. Esso Standard Oil Co., La. Div. 642 Carol Marie Drive, Baton Rouge.
- BENJAMIN C. CRAFT, (1952), Petroleum E., R., Tex. La. State University. Baton Rouge 3.
- BYRON E. CRAWFORD, (J), (1952), E. E., Esso Standard Oil Co. 9355 W. Inniswold Rd., Baton Rouge.
- CHARLES C. CRAWFORD, (L.M.), (1921), M. E., R., La., Tex. A. M. Lockett & Co., Ltd. 308 Whitney Bldg., New Orleans 12.
- JAMES C. CRAWFORD, (1954), C. E., R. State of La. 404 N. 7th St., West Monroe, La.
- DANIEL V. CRESAP, (1951), C. E., R. La. Dept. of Public Works. 1931 Elliot St., Alexandria, La.
- RONALD P. CRESSY, (J), (1952), C. E., R. T. Edward Ernst, 822 Perdido St., New Orleans 12.
- MARCEL E. CRETET, (1940), M. and E. E., R., Headquarters, TTAF, P. O. Box 1638, Long Beach, Miss.
- ROBERT N. CREWS, (J), (1948), C. E., R. J. Ray McDermott Co., Inc. P. O. Drawer 38, Harvey.
- FLOYD M. CRUM, (1953), E. E., R., La. State University. 3090 Dayton Drive, Baton Rouge, La.
- HORACE E. CRUMP, (L.M.), (1906), M. and C. E., Board of Commissioners, Port of New Orleans. 1422 Peniston St., New Orleans 15.
- CORNELIUS C. CRUSEL, (1944), C. and M. E., R., A. M. Lockett & Co. 308 Whitney Bldg., New Orleans, La.
- CLYDE J. CUCULLU, (1948), E. E., N. O. Public Service Inc. 4638 Arts St., New Orleans 22, La.
- LIONEL J. CUCULLU, (1928), M. E., R. N. O. Public Service Inc., 317 Baronne St., New Orleans.
- DAVID L. CULLOM, (L. M.), (1916), C. E., Retired. Box 5272, Station B. New Orleans 15, La.
- LEE VAN CUNNINGHAM, JR., (1954), M. E., E. E., R. Esso Standard Oil Co. 418 Croydon St., Baton Rouge.

D

- LOUIS J. DAIGRE, JR., (1954), Surveyor, R. Rapides Parish. Court House, Alexandria.
- JOSEPH V. D'AMICO, JR., (A), (1949), M. E. Louisiana Steam Equipment Co. 1118 Tchoupitoulas St., New Orleans.
- LAWRENCE R. DANIEL, JR., (1949), M. E., C. E., R. Louisiana Polytechnic Institute, Ruston, La.
- ELVIN J. DANTIN, (1954), C. E., R. Louisiana State University. 2082 Hollydale Ave., Baton Rouge.
- JULIAN A. DARDEN, (1955), E. E. Esso Standard Oil Co. 839 Rittiner Drive, Baton Rouge 6.
- THOMAS C. DAVID, (1940), C. E., R., Pan American Engineers. 1022 10th St., Alexandria, La.
- HENRY RICHARD DAVIES, JR., (J), (1947), M. E., R., Bedell and Nelson. 310 Brockenbraugh Ct., New Orleans 20.
- ALBERT B. DAVIS, JR., (1938), C. E. U. S. Corps of Engineers Galveston Dist. 5028 Avenue S, Galveston, Texas.
- EDWIN A. DAVIS, (1943), C. E., R. La. Dept. of Highways. 604 Laurel St., Baton Rouge 2, La.
- GEORGE B. DAVIS, (J), (1948), C. E., R. Boh Bros. Const. Co. 1923 Josephe St., New Orleans 15, La.

- GEORGE H. DAVIS, (L. M.), (1909), C. and M. E., R. N. Y., Penn., La. Ford, Bacon & Davis, Inc. 20 Exchange Place, New York 11, N. Y.
- JOHN F. DAVIS, JR., (J), (1951), E. E., R., International Petroleum Co., Ltd., Lima, Peru, S. A.
- RICHARD L. DAVIS, (1950), Ch. E., R., Shell Oil Co. 211 Marguerite, New Orleans 23.
- SAMUEL G. DAVIS, (1949), M. E., R., Self employed, 475 Woodvine Ave., New Orleans 20.
- WILLIAM M. DAVIS, (1947), C. E. Cities Service Refining Corp. Box 2583, Maplewood, La.
- HERBERT B. DAY, (1954), C. E., R. La. Dept. Public Works. P. O. Box 1789, Alexandria.
- RAY L. DAY, (J), (1949), C. E., M. E., R., A. C. Volk & R. L. Day. 109 W. Jefferson Ave., Bastrop, La.
- HAROLD J. DeBRAY, (J), (1949), C. E., R. Interstate Natural Gas Co., Inc. Box 1482, Monroe, La.
- RATHBONE, DeBUYS, (C.M.), (Jan. 1, 1898), Architect-Engineer, R., Private Practice, 1514 Calhoun St., New Orleans 18.
- FREDERICK A. DECKBAR, JR., (J), (1951), Ch. E., R., American Cynamid Co. 620 Airline Park Blvd., New Orleans 20.
- KENNETH M. DECOSSAS, (1945), Ch. E., U. S. Dept. of Agriculture So. Reg. Research Lab. 6529 Gen. Diaz St., New Orleans 19.
- LAURENT J. DeCOURT, (1952), E. E. Central La. Electric Co. New Iberia, La.
- ARTHUR A. DeFRAITES, Jr., (J), (1953), C. E., R., Ensign, U. S. Navy, USS Maury (A.G.S. 16) E.P.O., New York.
- RAGAN C. DEFREESE, (J), (1950), Sou. Bell Tel. Co. 1100 Riverside, Monroe, La.
- WALLACE V. deGRUY, (1939), E. E., R., N. O. Public Service Inc. 1524 Fillmore Ave., New Orleans 22, La.
- HARRY DEKERLEGAND, (J), (1952), C. E., La. Dept. of Highways, Rt. 1 Box 17, Arnaudville, La.
- DONALD C. DELAUNE, (1953), E. E., Esso Standard Oil Co. 3312 Myrtle Ave., Baton Rouge.
- A. H. DEMERS, (1943), E. E. Gulf States Utilities Co. 1915 Walnut St., Baton Rouge 7.
- CHRIS DEMOPULOS, (J), (1949), C. E., R. Ark., La., Tex. Demopulos & Ferguson, 212 Johnson Bldg., Shreveport.
- EDWIN L. DENNIS, (1941), Ch. and M. E., R. E. L. Dennis Engineering Co 5301 Canal Blvd., New Orleans 24.
- CURTIS LEE DENSON, (1952), M. E. La. Power and Light Co. Box 356, Sterlington, La.
- WALLACE P. deNUX, (1946), La. State Dept. of Public Works. 1907 White St., Alexandria, La.
- DONALD DERICKSON, (H. M.), (L. M.), (1912), C. E., R. Emeritus Professor and Head, School of Civil Engineering, Tulane University. 1311 Henry Clay Ave., New Orleans 18, La.
- JAMES H. DERR, JR., (1944), M. E., Gulf States Utilities Co., 322 Jefferson Dr., Lake Charles.
- LEON de SALIGNAC, (1936), C. E., R. Ala., Miss., Tenn. Pan-Am Southern Corp. 5122 Baronne St., New Orleans, La.
- GEORGE A. DeWOLF, (1946), Surveyor, R. State of La. Dept. Public Works Box 1693, Alexandria, La.
- H. ALDEN DEYO, (J), (1954), C. E., R. Chas. R. Colbert, Architect, 714 Southdown Place, Lafayette.
- HERBERT E. DICKARD, (1950), M. E., R., Herbert E. Dickard & Co., P. O. Box 1173, Monroe, La.
- JERRY L. DICKSON, (1947), Ch. E., R., The Flintkote Co. 2024 Gen. Pershing St., New Orleans 15, La.
- GENE V. DIETZ, (1950), Aeronautical E., M. E., Cities Service Refining Corp. 1705 10th St., Lake Charles, La.
- THEODORE W. DIETZE, (1942), E. E., R., N. Y. General Electric Co. 1912 Townsend Road, Schenectady 9, N. Y.
- PAUL A. DI GIOVANNI, (J), (1954), C. E., Cities Service Refining Corp. 3532 Columbus Circle, Lake Charles, La.
- STANLEY G. DINKEL, (1954), E. E., R., La., Miss. General Electric Co. 1004 Richards Bldg., New Orleans 12.

- FARRAR R. DODGE, (1949), C. E., California Div. of Highways. 650A 45th Ave., San Francisco, Calif.
- EMERY DOMINGUE, (J), (1949), C. E., R. Southwestern La. Institute. Box 485, S.L.I. Sta., Lafayette, La.
- PATRICK P. DONAHUE, (J), (1954), 1462 N. Rocheblave St., New Orleans.
- DOUGLAS A. DONALD, (1951), C. E., R., Esso Standard Oil Co. 3255 Morning Glory St., Baton Rouge, La.
- THOMAS F. DONLON, (1947), C. E., R., U.S. Naval Air Station, Norfolk, 11 Va.
- EDWIN E. DORAN, (1951), Agricultural E., R. La. State University. Agri. Eng. Bldg., L.S.U., Baton Rouge 3, La.
- BERNARD M. DORNBLATT, (1937), C. E., M. E., R., Ala., Ga., La., Miss. B. M. Dornblatt & Associates. Box 254, New Orleans 9, La.
- AUGUST HOFFMAN DOUGLAS, (A), (1942), Industrial Engr, Oliver H. Van Horn Co., Inc. 2473 Daggett Ave., Baton Rouge, La.
- AUGUST H. DOUGLAS, JR., (1954), M. E., R. American Creosote Works, Inc., P. O. Box 4008, New Orleans 18.
- DAVID G. DOUGLAS, (J), (1951), M. E., R. North American Aircraft. 609 W. Riffin St., Monterey Park, Calif.
- WALTER E. DOUGLAS, JR., (1942), C. E., R., U.S. Navy Dist. Public Works Office 8th N/D, 6807 Vicksburg, New Orleans 24.
- FLETCHER G. DOWNS, (1940), C. E., R., La. Highway Dept. 2068 Myrtledale Ave., Baton Rouge 6.
- JAMES M. DOYLE, JR., (1943), C. E., E. E., R., La., Tex., La. Dept. of Hwys. P. O. Box 667, Ferriday, La.
- JAMES HARRISON DRAKE, (1948), C. E., R., La. Dept. of Highways. 809 K St., Monroe, La.
- JESSE D. DRAKE, (1945), E. E., R., Miss. Drake Electric Co. Box 8098, Battlefield Sta., Jackson, Miss. 4.
- CHARLES R. DRAUGHON, JR., (1948), M. E., R., Esso Standard Oil Co. Rt. 1, Box 242, Zachary, La.
- WILLIAM J. DRAWER, JR., (1933), M. and E. E., R. New Orleans Public Service, Inc. 2611 Burdette St., New Orleans 25.
- ROBERT J. DRUEDING, (1926), C. E., R. Boh Bros. Const. Co. 4455 Lafaye St., New Orleans, La.
- PAUL E. DUBOIS, (1951), C. E., R., La., Okla. City of Oklahoma. 1244 S.W. 27th St., Oklahoma City 9, Okla.
- ANDRE J. DUBUS, (1940), Surveyor, R. Gulf States Utilities Co., P. O. Box 892, Lake Charles, La.
- RODERICK C. DUCHESNE, (1949), C. E., R. La. Polytechnic Institute. Rt. 1, Ruston, La.
- LOUIS DUCLOS, (1947), C. E., M. E., E. E., R. La. Dept. of Highways. 4328 Hyacinth Ave., Baton Rouge 15, La.
- WILLIAM H. DUDLEY, III, (J), (1953), M. E., R., 1456 Madrid St., New Orleans 22.
- RAYMOND E. DUFRECHOU, (J), (1951), C. E., Liberty Welding & Iron Works. 1333 Julia St., New Orleans, La.
- JOHN V. DUGAN, JR., (A), (1941), M. E., Edgar Murray Supply Co. Inc. P.O. Box 74, New Orleans 6, La.
- KENNEDY J. DUGAS, (J), (1949), M. E. Texas Co. 626 Lauricella St., New Orleans 21.
- ROBERT G. DUGUE, (A), (1954), Industrial Sales Engineer. 1111 Foster Drive, Baton Rouge.
- JOHN S. DUHE, (1943), M. E., Kaiser Aluminum & Chemical Corp. 4764 Orchid St., Baton Rouge.
- CLAIBORNE J. DUHON, JR., (J), (1950), E. E., R. U.S. Air Force. Box 1155, Ellington AFB, Houston, Texas.
- HARRY L. DULA, (1953), C. E. Barnard & Burk. 214 E. Second St., Lafayette, La.
- CRAWFORD K. DUNBAR, (1949), C. E., R. Ala., La., City-Parish Dept. Public Works, P. O. Box 155, Baton Rouge.
- A. LEE DUNLAP, (1925), (L.M.), M. E., R., Tulane University. 935 Pine St., New Orleans 18, La.
- C. MONROE DUNLAP, (J), (1949), C. E., R., Ouachita Parish Hwy. Dept. 1205 N. McGuire St., Monroe, La.

- EDGAR M. DUNN, (1942), E.E., M.E., R. Board of Commissioners. Port of New Orleans. 934 Howard Ave., New Orleans.
- EDMOND E. DUPRE, JR., (J), (1952), C.E. P. O. Box 128, Kaplan, La.
- AUGUSTUS W. DURNING, (1943), Ch. E., M.E., R. La. Power & Light Co. 12 Forrest Ave., New Orleans 20, La.
- ALLAN T. DUSENBURY, (L.M.), (1906), C.E., R., Private Practice. 1213 American Bank Bldg., New Orleans 12, La.
- JAMES T. DWYER, JR., (1941), Ch. E. Gulf Oil Corp., Box 701, Port Arthur, Texas.
- WILLIAM H. DYER, JR., (J), (1952), E.E., R., Ogden & Woodruff, Consulting Engrs. 5220 South Afton Parkway, Baton Rouge.
- OSBORN J. DYKES, JR., (1949), M.E., R. The Dykes Co., Inc., P. O. Box 1763, Shreveport 69.
- GERALD R. DYSON, (1955), C.E., R. La. Dept. Public Works. 216 Ricou-Brewster Bldg., Shreveport.
- LESLIE M. DYSON, (J), (1949), E.E., R., La. Polytechnic Inst., Box 322, Tech Station, Ruston, La.

E

- HOLMES EARL, (J), (1942), C.E., R., Earl and Indest. 7303 Freret St., New Orleans 18, La.
- RALPH EARL, (L.M.), (1913), C. E., R., City of N. O. Div. of Regulatory Inspection, 2125 Leonidas St., New Orleans 18, La.
- RICHARD H. EARL, (1945), C.E., M.E. and Mining Engineer, R., Texas, La. Freeport Sulphur Co., Port Sulphur, La.
- CHARLES H. EDWARDS, JR., (J), (1950), C.E., R., La. Polytechnic Institute, Ruston, La.
- CLARENCE C. EDWARDS, JR., (1942), C.E., R., La. Dept. of Highways. Box 872, Alexandria, La.
- WILLIAM D. EDWARDS, JR., (1951), M.E., R. La., Tenn., Barnard & Burk. 1722 Enoree Ave., Columbia, S.C.
- JOHN P. EAGAN, (A), (1931), Assistant Engineer. New Orleans Public Service Inc. 5436 S. Claiborne Ave., New Orleans 15.
- S. W. ELBERSON, (L.M.), (1911), M.E., E.E. Retired. 360 Duperier Ave., New Iberia, La.
- M. H. ELISSALDE, (1942), E. E., R., Tex. Gulf States Utilities Co., 2645 Ashley Ave., Beaumont, Texas.
- CLAUDE K. ELKINS, JR., (J), (1951), C.E., R. Southern Bell Tel. & Tel. Co. 1542 Wakefield Place, Apt. B, New Orleans 22.
- D. X. ELLETT, (1950), C.E., R., La., Miss., Ala., Ga., Okla., Mich., Ford Bacon & Davis, N. Y. Box 1762, Monroe, La.
- RUSSEL N. ELLIOTT, (1945), E.E. Texas Pipe Line Co. 1705 Johnson St., Lafayette, La.
- RALPH C. ELLIOTT, (J), (1951), M.E., Cities Service Refining Corp. 702 College St., Lake Charles, La.
- JOHN A. ELLIS, (1949), E.E., R. Gulf States Utilities Co. 3338 Myrtle Ave., Baton Rouge, La.
- JOHN HAMILTON ELLIS, (1949), C.E., R., Highway Dept. Caddo Parish Police Jury, 1141 Janther Place, Shreveport 49, La.
- SYDNEY ELLIS, JR., (1940), M.E., Ch. E., R. N. O. Public Service, Inc., 317 Baronne St., New Orleans 9.
- WILLIAM C. ELLIS, (1947), E.E., R., Walter J. Barnes Electric Co. 7814 Burthe St., New Orleans 18.
- JOHN B. ELSTROTT, (1952), Ch. E., R., Walter Cooke-Associate. 816 Howard Ave., New Orleans 12.
- O. H. ELVERUM, (1936), C. E., Box 23, Morgan City, La.
- WALDO A. ERICKSON, (1945), M. and E. E. Shell Oil Co., Inc., Norco, La.
- T. EDWARD ERNST, (1934), C.E., M.E., E.E., R., La., Miss. Consulting Engineer, Private Practice. 322 Perdido St., New Orleans 12.
- ALBA J. ETIE, JR., (J), (1954), J. B. Beard Co. 2723 Meadow St., Shreveport.
- J. BRES EUSTIS, (1951), C.E., R., La., Miss. Eustis Engineering Co., 3635 Airline Hwy., New Orleans 20.
- EDWARD E. EVANS, (1947), C.E., R. Louisiana State University. 2025 Avondale Drive, Baton Rouge.

- WILLIAM S. EVANS, (1949), C. E., M. E., R. Licensed Architect, Conn., Okla., La., Miss., Texas. Private Practice of Architecture and Engr. 620 Johnson Bldg., Shreveport, La.
- NOEL J. EVERARD, (J.), (1950), C. E., R. Short & Everard. 4800 Press Drive, New Orleans.
- JAMES P. EWIN, JR., (1951), C. E., R., La., Ala., Miss., Tex., Ewin & Campbell, 7303 Freret St., New Orleans 18.
- FORREST W. EWING, (1953), M. E., Esso Standard Oil Co. 7953 Prescott Road, Baton Rouge.
- MARSHALL BROOK EWING, (1943), M. E., E. E., R., Air Conditioning Appliance Corp. Box 768, Alexandria, La.

F

- LOUIS M. FALCONER, (J.), (1950), M. E., The Texas Co. 1324 Harrop St., Pasadena, Tex.
- NORRIS L. FANT (1954), M. E. Delta Match Corp. 818 Octavia St., New Orleans.
- ARNOLD LESLIE FARMER, (1948), E. E., R., N. O. Public Service Inc. 214 N. Anthony St., New Orleans 19.
- BENJAMIN R. FARMER, JR., (J.), (1953), Pet. E. Active duty, U.S.A.F. Box 164, W. Monroe, La.
- JAMES J. FARRELL, (1954), E. E. General Electric Co., 1310 Mundy Ave., Apt. 12, El Paso, Tex.
- NORMAN P. FAUCHEUX, (J.), (1949), E. E., Kaiser Aluminum & Chemical Corp. 1931 Benjamin St., Arabi, La.
- ARTHUR E. FAULK, JR., (J.), (1948), E. E., R. Marine Electric Co. 114 E. Congress St., Lafayette.
- KENNETH H. FAULK, (J.), (1951), Ch. E. Cities Service Refining Corp. 2624 South St., Lake Charles.
- JAMES C. FAULKNER, (1949), M. E., R. Texas Eastern Transmission Corp. P. O. Box 1612, Shreveport.
- FRANCIS J. FAVALORO, (1945), E. E., R. New Orleans Public Service Inc. 1600 So. Peters St., New Orleans 13.
- HAROLD FRANCIS FAVRET, (1937), C. E., R. Lionel F. Favret Co., Inc. 937 Gravier St., New Orleans 12, La.
- JAMES E. FAVRET, (1942), C. E., Lionel F. Favret Co., Inc. 937 Gravier St., New Orleans 12.
- ALBERT H. FAY, (1951), Architect. Nat'l. Gypsum Co., 325 Delaware Ave., Buffalo 2, N. Y.
- EUGENE RAY FELTON, (J.), (1952), E. E., R., Esso Standard Oil Co. 2156 Stuart Ave., Baton Rouge, La.
- FRED H. FENN, (1938), C. and E. E., College of Engineering, Louisiana State University, Baton Rouge, La.
- CHARLES H. FENSTERMAKER, (L.M.), (1914), C. E., R., Consulting Engr. P.O. Box 293, Oakdale, La.
- ARTHUR J. FERGUSON, (1938), M. E., R., Esso Standard Oil Co. 1528 Longwood Drive, Baton Rouge, La.
- BILLY M. FERGUSON, (1949), C. E., R. Demopulos & Ferguson, 212 Johnson Bldg., Shreveport.
- PETER A. FERINGA, Maj. Gen. USA (Ret.), (1954), C. E. New Orleans Public Service Inc., P. O. Box 340, New Orleans.
- FERNANDEZ, JOHN P., (1943), M. E., E. E., C. E., R. U.S. Navy, Dist. Public Works Office, 8th N/D. 9011 Apple St., New Orleans 18.
- CHARLES H. FILGO, (J.), (1953), C. E., Esso Standard Oil Co. P. O. Box 551, Baton Rouge.
- ROSCOE J. FINKE, (1954), C. E., R. Farnsworth & Chambers Co., Inc. 1221 Waltham St., New Orleans 20.
- WILLIAM T. FIRESHEETS, (1954), E. E., R. La. Dept. of Highways. 762 Aster St., Baton Rouge.
- MARVIN L. FIRMIN, (J.), (1954), E. E. New Orleans Public Service Inc. 3924 Palmyra St., New Orleans 19.
- FRANK P. FISCHER, (1940), M. E., R., Frank P. Fischer Engineering Co., 7924 Maple St., New Orleans 18.
- CHARLES H. FISHER, (1954), Agricultural Scientist, Southern Research Laboratory, U.S. Dept. Agriculture. 2100 Robt. E. Lee Blvd., New Orleans 19.

- CHARLES LEAHY FISHER, (1940), C. E., R. City of New Orleans. 1014 Aline St., New Orleans 15.
- MELVIN S. FISHER, JR., (J), (1950), M. E. The Flintkote Co. 6609 Louis XIV St., New Orleans 24.
- EUGENE L. FITHIAN, (A), (1940), Eugene Dietzgen Co. 318 Camp St., New Orleans 12.
- R. F. FITZGERALD, (A), (1949), Contractor. Fitzgerald Plumbing & Heating Co., Inc. Box 1382, Shreveport.
- WILLIAM E. FITZGERALD, (1949), M. E., R. Fitzgerald Plumbing & Heating Co., Inc. Box 1382, Shreveport.
- H. A. MIKE FLANAKIN, (1940), C. E., R. La. Tex., Dist. Columbia. American Trucking Assns., Inc. 8702 Milford Ave, Silver Spring, Md
- J. D. FLEMING, JR., (1947), E. E. Gulf States Utilities Co. 637 Pierce Ave., Baton Rouge, La.
- OLIVER M. FLETCHER, (1954), M. E., R. La., Ala. Weeks Supply Co., Ltd. P. O. Box 1572, Monroe, La.
- LIONEL E. FLOTTE, SR., (1939), C. E., R. La., Ala., Tex., Miss. Cooperative Cold Storage Builders. 5707 Pitt St., New Orleans.
- GEORGE A. FLOURNOY, (1953), Structural E. Cities Service Refining Corp. 2122 Ninth St., Lake Charles, La.
- WILLIAM E. FLOWERS, (1950), C. E., E. I. Dupont de Nemours & Co. Box 15, Jackson, So. Carolina.
- DAVID H. FLOYD, (1952), C. E., Petroleum E., R. La., Okla., Tex. Southwest Natural Gas Co., Box 1487, Shreveport.
- J. THAD FLOYD, JR., (1939), C. E., R., Metal Building Products Co. 1937 Lafayette St., New Orleans 6.
- PRESTON M. FLOYD, JR., (A), Floyd Electric Co. Inc. 6600 Florida Blvd., Baton Rouge.
- HOMER FLYNN, JR., (1950), C. E., R. Southern Builders, Inc. 219 E. Slattery, Shreveport, La.
- JOHN T. FOLK, (1948), C. E., R. Retired Prof. of C. E. La. Polytechnic Institute. 108 S. Bonner St., Ruston, La
- CHARLES C. FORD, (1952), E. E., R., Central La. Electric Co., Inc. 612 S. Lexington Ave., Bunkie, La.
- HAROLD N. FORD, (1949), E. E., R., New Orleans Public Service Inc. 4061 St. Ferdinand St., New Orleans 22.
- GEORGE P. FORMAN, (1949), C. E., R., La. Dept. of Highways. P.O. Box 752, Monroe, La.
- CHARLES B. FOSTER, JR., (1949), C. E., R. City of Shreveport, Dept. of Water & Sewerage. City Hall, Shreveport, La.
- FRANK S. FOSTER, JR., (1955), C. E., R. Portland Cement Association. 901 Walker St., New Orleans 24.
- JAMES M. FOURMY, (1940), C. E., R., Consulting Engineer. 308 N. Pine St., Hammond, La.
- MAURICE B. FOURNET, (J), (1949), M. E., R., Morton Salt Co., Bay Chemical Div. P. O. Box 301, Weeks, La.
- FREDERICK H. FOX, (L.M.), (1922), C. E., R. Dept. of Civil Engineering Tulane University, New Orleans 18, La.
- HARDY B. FOWLER, (1951), M. E., R., W. Horace Williams Co., 833 Howard Ave., New Orleans 13, La.
- LUIGI FRANCILO, (1948), M. E., R., Boland Machine & Mfg. Co., Inc. 2100 Lowerline St., New Orleans 18.
- ALBERT J. FRANSEN, (1934), M. and E. E., Industrial Steel Co., Inc. Box 728, Rt. 2, New Orleans 23.
- LOUIS T. FRANTZ, (1936), E. E. Consulant. 8735 Apricot St., New Orleans 18.
- HAROLD M. FRASER, (1943), Ch. E., R., International Lubricant Corp. P.O. Box 390, New Orleans, La.
- MARION ELLIS FRATER, (1943) Architect, R., W. Horace Williams Co., 833 Howard Ave., New Orleans 12.
- ERNEST M. FREEMAN, (1939), C. E., R., La., Tex., Okla., Miss., Ark. E. M. Freeman & Associates. Continental-American Bank Bldg., Shreveport, La.
- LOUIS S. FREEMAN, (1954), M. E. Esso Standard Oil Co., La. Div. 5851 Lanier Drive, Box 149, Rt. 1, Baton Rouge.
- ENOCH J. FRENCH, (J), (1952), C. E., City of Shreveport. Rt. 2, Box 140, Vivian, La.

- WILLIAM H. FRENCH, (1947), C. E., R. Freeport Sulphur Co. Box 728, Port Sulphur, La.
- CLIFTON A. FREY, (1949), C. E., M. E., E. E., R. E. M. Freeman & Associates. 976 Jordan St., Shreveport.
- DAVID B. FRIED, JR., (J), (1949), E. E., R. Self Employed. 610 Poydras St., New Orleans 12.
- JOSEPH J. FRIEDLER, JR., (1947), Heating and Ventilating E. Ilg. Electric Ventilating Co. 2850 N. Pulaski Ave., Chicago 41, Ill.
- HARRY W. FRISTOE, JR., (1954), E. E., R. Southern Bell Tel. & Tel. Co. 411 N. 9th St., Monroe
- A. F. FRITCHIE, (1945), M. E., E. E., R. Standard Oil Co. of N. J. Box 204 Highland Road, Baton Rouge 1
- JACOB C FRITZ, JR., (J), (1952), Ch. E. Research Fellow, University of Wisconsin. 621 N. Lake St., Madison 5, Wis.
- ALVIN M. FROMHERZ, (L. M.), (1915), C. E., R., La., Miss., Ala. Fromherz Engineers. 816 Howard Ave., New Orleans 12.
- FRANK C. FROMHERZ, (1943), C. E., R. Fromherz Engineers. 816 Howard Ave. New Orleans 12.
- THOMAS A. FROMHERZ, (1945), C. E., R., Fromherz Engineers. 1906 Broadway, New Orleans 18.
- FORNEY FULLER, (1953), M. E., R. Ala. Combustion Engineering, Inc. 255 Lee Circle Bldg., New Orleans 13.
- MINOR M. FUNDERBURK, (1949), E. E. Louisiana Power & Light Co., Box 304, Sterlington, La.
- WALTER H. FUSH, (1953), E. E., R., Ebasco Services Inc., P.O. Box 231, New Orleans 3.

G

- WILLIAM C. GADDY, JR., (J), (1952), C. E., R., Esso Standard Oil Co., 1746 Marshall Drive, Baton Rouge.
- GAUDENZ GADMER, (J), (1948), Ch. E., R., Pan-Am Southern Corp., Destrehan, La.
- NICHOLAS J. GAGLIANO, (J), (1949), E. E., Loyola University School of Law. 6115 Canal Blvd., New Orleans 24.
- BENJAMIN E. GALLOWAY, JR., (1941), C. E. 46 Ravan St., (Harahan), New Orleans 23.
- CARY B. GAMBLE, (1941), M. and E. E., R. Tex., Miss., Ala., Tenn., Ga., Ky., Ind., N. C., S. C., La., Carey B. Gamble & Associates. 635 Commercial Place. New Orleans 12.
- GLENN D. GARBER, (J), (1948), M. E. Cities Service Refining Corp. 193 Watkins St., Lake Charles, La.
- VERGIL S. GARNETT, (1949), C. E., R. Olin Gas Transmission Corp. P. O. Box 1482, Monroe, La.
- JOSEPH D'L. GARON, (J), (1949), M. E. 2116 Burdette St., New Orleans.
- MARION D. GARRISON, (1949), M. E., Mo. Matheison Chemical Corp. 1709 Kirkman St., Lake Charles.
- EDWARD A. GASTROCK, (1954), Ch. E., R. Southern Regional Research Laboratory. 5973 Canal Blvd., New Orleans 24.
- JOHN R. GAUGLER, (1950), E. E. Central La. Electric Co. 1015 Lee Ave., Lafayette, La.
- FRANK G. GAULT, 1939), M. E., R. A. M. Lockett & Co., Ltd. P. O. Box 553, Lake Charles, La.
- JOHN STONE GENTILICH, (1933), C. E. U. S. Engineer Corps, N. O. District. 4675 Venus St., New Orleans 17.
- ROY GEOGHEGAN, (1949), C. E., R. Ala. Plibrico Sales and Service Co. 21 Colonial Club Drive, New Orleans 23.
- FRANK J. GERMANO, (1938), C. E., Louisiana State University, Baton Rouge, La.
- EDWARD H. GESSNER, (1933), C. E., R., La., N. Y., Ala., Ga., Puerto Rico., Martin Eng Co. Apartado 370, Maracaibo, Venezuela.
- WALTER D. GIBSON, (A), (1951), C. E., R. La. Dept. of Highways. Box 545, Oak Grove, La.
- JOHN B. GIDDENS, JR., (1953), C. E., R., Board of Commissioners, Port of N. O. 2 Canal St., New Orleans.
- ROBERT B. GEIZENTANNER, (1954), M. E., R. La., Okla. Interstate Oil Pipe Line Co. Box 1107, Shreveport.

- H. R. GILBERT, (A), (1950), John H. Carter Co. 1531 Fern St., New Orleans.
- RILEY L. GILBERT, (1943), M.E., R. La., Texas. Gulf Engineering Co. 28 Chatham Drive, New Orleans 22.
- M. MACK GILKESON, JR., (1953), Ch.E., Met.E., R. Tulane University, 49 Colonial Club Drive, New Orleans 23.
- SIDNEY S. GILL, (1949), M. E. Thermatomic Carbon Co. 701 K St., Monroe, La.
- ERNEST McKAY GILLEN, (1944), C.E., R. La. Dept. of Highways. 101 Egan St., Shreveport, La.
- H. C. GILLEN, (A), (1951), Texcrete Co. 2110 Highland Ave., Shreveport.
- J. HARRY GILLUM, (1934), E.E. Standard Oil Co. 1332 Lee Drive, Baton Rouge.
- ELVOY L. GISH, (A), (1954), Engineering Artist, La. Dept. of Highways. 3388 Delaware St., Baton Rouge.
- ALLEN T. GIVENS, (1948), M.E., Columbian Carbon Co. 603 Auburn St., Monroe, La.
- WESLEY D. GLASSELL, (J), (1954), C.E., R. La., Ark. W. D. Glassell Co. P.O. Box 1622, Shreveport.
- HOWARD W. GLEASON, (1938), C.E., R., Shelby Construction Co. Inc. 320 Brockenbraugh Court, New Orleans 20, La.
- ALBERT A. GLODT, (1949), C.E., Gulf Refining Co. 208 Atahania Parkway, New Orleans 20, La.
- JOHN A. GLOVER, (1938), C. E. George J. Glover Co., Inc. 206 Vincent Ave., New Orleans 20.
- DAVID W. GODAT, (L.M.), (1924), C.E., M.E., R., La., Miss. David W. Godat & Associates. 4900 St. Charles Ave., New Orleans 15, La.
- MAYER GODCHAUX, (1920), M.E. Mayer Godchaux Mechanical Contractors. P.O. Box 1637, New Orleans.
- WALTER GODCHAUX, JR., (1938), Ch.E., R., Godchaux Sugars, Inc. 1835 Octavia St., New Orleans 15.
- JOSEPH McCORMACK GONDRAN, (L.M.), (1923), C. E., 8228 Panola St., New Orleans 13.
- LOUIS K. GOOD, (1944), C.E. R. P. Farnsworth & Co., Inc. P. O. 850, New Orleans 2.
- EDWIN HENRY GOODLOE, (1942), C.E., R., La. Dept. of Highways. 732 North 5th St., Baton Rouge.
- FRED L. GOODMAN, (1950), C.E., R. Ind., Barber Bros. Co. P. O. Box 629, Baton Rouge.
- LOUIS N. GOODMAN, (1951), E.E., R. La., Miss. Louis N. Goodman & Associates, 405 Audubon Bldg., New Orleans 16.
- ALFRED N. GORDON, (1951), M.E., R., Esso Standard Oil Co., 2228 Edinburgh Ave., Baton Rouge.
- ROBERT E. GOSA, (1929), C.E. W. Horace Williams Co. 833 Howard Ave., New Orleans 12.
- GERALD M. GOSSEN, (J), (1950), C.E., Gossen Construction Co. P.O. Box 818, Lafayette, La.
- ALVIN G. GOTTSCHALL, (1943), M.E., R. Gulf Refining Co. 7444 St. Charles Ave., New Orleans 18.
- JOHN MALLORY GRACE, (1947), M.E. La. Fire Extinguishers, Inc. Baton Rouge 12.
- BERNARD GRAFF, SR., (1939), M. and E.E. Mundet Cork Corp. 1321 Dante St., New Orleans 18.
- RICHARD N. GRAHAM, (1944), C.E. U. S. Corps of Enginners, N. O. Dist. 2407 Gen. Pershing St., New Orleans 15.
- PRENTIS G. GRAMBLING, JR., (1952), M.E., E.E., R. City of Ruston. P. O. Box 45, Ruston, La.
- ARTHUR A. GRANT, (1937), M.E., R., Private Practice. 1745 National Bank of Commerce Bldg., New Orleans 12.
- FRANCIS W. GRANT, (1949), C.E., R., Private Practice. Continental-American Bank Bldg. Shreveport, La.
- BISHOP B. GRAVES, JR., (J), (1953), C. E., Esso Standard Oil Co. 806 Euclid St., Jackson, Miss.
- CHARLES L. GRAVES, (1948), C.E., R. J. Ray McDermott & Co. 1329 Octavia St., New Orleans 15.
- CHARLES H. GREEN, (1937), C.E. William F. Surgi Equipment Co. P. O. Box 1309, New Orleans 10, La.

- ISAAC M. GREGORIE, (J), (1954), Industrial E. Esso Standard Oil Co. 3534 Hyacinth Ave., Baton Rouge.
- HARBERT S. GREGORY, (1952), E. E., R., Gregory-Salisbury & Co., 320 Julia St., New Orleans 12.
- BERNARD A. GREHAN, (1942), C. E., R. B. M. Dornblatt & Associates, Inc. 2831 Octavia St., New Orleans 15.
- ROBERT H. GREHAN, (J), (1950), C. E., R. N. O. Public Service Inc. 1207 Henry Clay Ave., New Orleans.
- F. B. GREVEMBERG, (1907), C. E., R., District Public Works Office, 8th Naval Dist. 217 Norland Ave., New Orleans 14.
- GEORGE JOHN GROH, (J), (1949), M. E., R., R. J. Tricon Co. 751 Tchoupitoulas St., New Orleans.
- HENRY K. GROVES, (1951), Petroleum E. Esso Standard Oil Co. 1133 Richland Ave., Baton Rouge, La.
- ROBERT J. GRUSH, (1949), M. E., R., F. N. Johnson Co. 534 Carol Drive, New Orleans 21.
- WILL S. GUEDRY, (1940), C. E., R., A. M. Mutersbaugh. 1105 Reid St. Lake Charles, La.
- MARIO R. GUELL, (1933), E. E., R., Gaylord Container Corp. Mill Division, Bogalusa, La.
- GARY J. GUIDRY, (J), (1952), Air Cond. Engr. United Gas Corp. 120 Iberia St., New Iberia, La.
- WALDECK F. GUILBEAU, (1943), Ch. E., R. Southern Regional Research Laboratory. 6644 Louis XIV St., New Orleans 24.
- J. MASON GUILLORY, (1933), M. and E. E., R. New Orleans Public Service, Inc., 317 Baronne St., New Orleans 9, La.
- AUDLEY P. GUILLORY, (1955), C. E., R. La. Dept. of Highways. R.F.D. No. 1, Box 331, Ville Platte, La.
- EDGAR E. GUILLOT, JR., (1947), C. E., R., La. Dept. of Highways. Box 595, Lafayette, La.
- MALCOLM A. GUILLOT, (1950), M. E., R. Corps of Engrs., U.S. Army. 1221 Berhman Ave., New Orleans 14.
- DONATO E. GUIZA, (1939), C. E., R., Boh Bros. Construction Co. 207 Sena Drive, New Orleans 20.
- WALTER GULICK, (1954), M. E. Ethyl Corp. 1734 Stuart Ave., Baton Rouge.
- SAM P. GULLATT, JR., (1951), E. E., R. 713 Hanshaw Rd., Ithica, N. Y.
- JOSEPH W. GUNN, (1949), Ch. E., Lone Star Cement Corp. 1120 Hibernia Bldg., New Orleans 12.
- L. E. GUNTER, (A), (1954), City of Alexandria. 105 South St., Alexandria.
- JAMES L. GURAEDY, (A), (1953), M. E. United Gas Corp., Monroe, La.
- WILLIAM BREWSTER GURNEY, (1943), M. E., Gulf States Utilities Co. 2631 Hundred Oaks Ave., Baton Rouge.
- MARTIN M. GURTLE, II, (1938), C. E., R. La., Ala., Gurtler, Hebert & Co. P. O. Box 8066, New Orleans.

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- JOHN A. HAASE III, (1939), C. E., R., Haase Construction Co., Inc. 5901 Vicksburg St., New Orleans 19.
- ROBERT N. HABANS, (1939), C. E., R., Orleans Materials & Equipment Co., Inc. 53 Dove St., New Orleans 24.
- JOSEPH O. HACHET, JR., (1948), E. E., Shell Oil Co. Box 153, LaPlace, La.
- ALLEN S. HACKETT, (L. M.), (1921), C. E. 1580 Jefferson Ave., New Orleans 15.
- CARL M. HADRA, (1951), M. E., E. E., R., La., Ark. Carl M. Hadra Associates, 3109 Alexander, Shreveport.
- EDGAR J. HAGSTETTE, JR., (1935), Ch. E., R., Calif. P. O. Box 1675, Houston, Texas.
- WM. E. HAINES, (1954), C. E., R. Va. Esso Standard Oil Co. 1922 Cherokee Ave., Baton Rouge.
- HARRELL A. HAIR, (1954), C. E., R. La. Dept. of Highways. 606 Police St., Minden, La.
- CHRISTOPHER H. HALL, (1950), M. E., R., Esso Standard Oil Co. 2158 Stuart Ave., Baton Rouge, La.
- ELMER P. HALL, (J), (1951), C. E., Texas Co. 6831 West End Blvd., New Orleans 24.

- HARVEY A. HALL, (1945), C. E., R., Dept. of Public Works. 675 Canal St., Baton Rouge, La.
- HARVEY JAY HALL, (1952), M. E., Esso Standard Oil Co. 1730 Steele Blvd., Baton Rouge, La.
- IRA E. HALL, (A), (1946), Flynn Mfg. Co. 1009 Guaranty Bank Bldg., Alexandria, La.
- RUSSELL A. HALL, (J), (1951), C. E., R., T. Edward Ernst. 513 Sena Drive, New Orleans 20.
- W. HANSEN HALL, (1941), E. E., R., La., Tex., Miss. Southwestern La. Institute. 517 West St. Joseph St., Lafayette.
- DANIEL HALLARON, JR., (1939), M. E., E. E., R., New Orleans Public Service Inc. 317 Baronne St., New Orleans 9.
- JAMES H. HAMILTON, (1951), Ch. E., Barrow-Agee Laboratories, Inc. Box 858, Shreveport, La.
- JOHN W. HAMILTON, JR., (J), (1954), M. E., R. Columbian Carbon Co. 1800 Milton St., Monroe.
- GEORGE R. HAMMETT, (L.M.), (1920), M. E., R., A. M. Lockett & Co., Ltd. P.O. Box 561, New Orleans 7.
- FRED A. HANNAMAN, JR., (1944), M. E., R., Esso Standard Oil Co. 1671 Cedardale Ave., Baton Rouge.
- IRVEN E. HANSON, C. E., R., Freeport Sulphur Co. 2115 Joseph St., New Orleans.
- FENTON HARDING, (1953), C. E., R. La., Tex. Southwestern La. Institute. Box 344, S.L.I., Lafayette, La.
- WILLIAM HARDY, (1937), Construction E., Hardy-Stevens Co. 917 Carondelet Bldg., New Orleans.
- QUENTIN W. HARGROVE, (1953), M. E., E. E., R. Neild-Somdal Associates. 736 Robinson Place, Shreveport, La.
- M. L. HARGUS, (A), (1953), United Electric Service. 2407 North 7th St., West Monroe, La.
- ALLAN J. HARRIS, (L.M.), (1924), M. E., R., Allan J. Harris Co.. 7615 Jeanette St., New Orleans 18.
- ELBERT F. HARRIS, (1954), C. E., R. La., Miss. Consulting Engineer. 720 Murray St., Alexandria.
- WILLIAM K. HARRIS, (1954), M. E., R. United Gas Corp. 1511 Fairview Ave., Monroe.
- WILLIE RAY HARRIS, (J), (1951), E. E., Gulf States Utilities Co. Box 342, Beaumont, Texas.
- ROBERT M. HARRISON, (J), (1950), E. E., Southern Bell Tel. & Tel. Co. Houma, La.
- MAURICE R. HARTMAN, JR., (1953), M. E., R., Olin Matheison Chemical Corp. Box 896, Lake Charles, La.
- AUDIO G. HARVEY, (1952), E. E., M. E., La. Delta Exploration Co. 11 Park St., Port of Spain, Trinidad, B.W.I.
- JAMES E. HASSINGER, JR., (J), (1945), C. E., R. 2021 S. Carrollton Ave., New Orleans 18.
- WALTER L. HASTINGS, (A), (1950), Sales E., Layne Louisiana Co. P. O. Box 924, Lake Charles, La.
- JOHN D. HAVERKAMP, (1946), M. E., E. E., New Orleans Public Service Inc. 317 Baronne St., New Orleans 9.
- EUGENE C. HAWKINS, (1948), C. E., M. E., E. E., R., Celotex Corp. 508 Hector Ave., New Orleans 20.
- N. L. HAWKINS, (1943), C. E. Orleans Materials & Equipment Co. P. O. Box 87, New Orleans 6, La.
- CURTIS F. HAWLEY, (J), (1954), E. E. Westinghouse Electric Corp. 1226 Whitney Bldg., New Orleans 12.
- W. WALLACE HAY, (1927), C. E., R. Tennessee Valley Authority. Arnstein Bldg., Knoxville, Tenn.
- HONORE M. HAYNE, (1948), C. E., R., Dept. of Public Works. 2106 Stanford Ave., Baton Rouge, La.
- ARTHUR C. HAYS, (1940), Sales E. Manufacturer's Representative. 1221 Carondelet Bldg., New Orleans 12.
- EDWARD T. HEARD, JR., (1954), M. E., R. State of La. Dept. of Revenue. P. O. Box 1521, Monroe.
- JOHN E. HEARD, (1954), C. E., R. Self employed. 644 Kingshighway, Shreveport 38.

- MARION D. HEATH, (1948), C. E., R. La. Dept. of Public Works. 2059 Cloverdale Ave., Baton Rouge 6.
- J. I. HEBERT, JR., (1941), C. E., R., C. W. Mackie Co. 931 Poydras St., New Orleans, La.
- JOHN A. HEBERT, (1953), E. E., R. Southern Bell Tel. & Tel. Co., 1215 Prytania St., New Orleans 13.
- MALCOLM P. HEBERT, (J), (1953), M. E. Roland Construction Co., Box 850, Alexandria, La.
- OMER J. HEBERT, (1947), C. E., R., Hebert Bros. 1015 Osage Ave., Plaquemine, La.
- GEORGE A. HEFT, (1939), C. E., M. E., E. E., R. La., Ala., G. A. Heft & Co. 2420 Audubon St., New Orleans 18.
- ELBERT S. HEIM, (1949), C. E., R., La. Dept. of Highways. 1017 New Benton Road, Bossier City 66, La.
- CARL J. HELBAK, (1949), C. E., R. La. c/o Ellis LaBorde, Mgr., City Park. New Orleans 19.
- SAMUEL J. HELEMAN, (1950), E. E., R. Barnard & Burk. 1023 Nicholson Drive, Baton Rouge, La.
- NUMA J. HELWICK, (1936), M. E., R., Crescent City Heating & Plumbing Co. 809 Greenwood St., New Orleans 24.
- HARRY B. HENDERLITE, (1929), C. E., R. La., N. C. Masters & Henderlite. 249 Bellevue Dr., Baton Rouge, La.
- JAMES P. HENDERSON, (1938), M. E., 1627 S. Carrollton Ave., New Orleans 18.
- WM. H. HENKEL, SR., (1951), M. E., E. E., R., James M. Todd & Associates. 617 Carol Drive, New Orleans 21.
- THOMAS R. HENRY, JR., (J), (1949), C. E., M. E., R., Columbian Gasoline Corp. Box 1562, Monroe.
- LEWIS W. HENSLEE, JR., (1951), Ch. E., Columbia-Southern Chem. Corp. 1838-A First St., Lake Charles, La.
- H. WILLIAM HERBST, (1952), C. E., R., B. M. Dornblatt & Associates, Inc. 3026 St. Charles, Apt. 2, New Orleans 15.
- F. M. HERROY, SR., (1946), C. E., U. S. Corps of Engineers., N. O. District. 103 Elvis Court, New Orleans 20.
- FRANK M. HERROY, JR., (J), (1948), C. E., R., City of New Orleans, Division of Traffic Engineering. 103 Elvis Court, New Orleans 20.
- J. O. HERPIN, (1950), M. E., E. E., R. Retired. 714 Lafayette St., Lafayette, La. Lafayette St., Lafayette, La.
- RICHARD C. HERRELL, (J), (1950), M. E., Esso Standard Oil Co. 5788 Dutton Ave., Baton Rouge, La.
- WALTER T. HERRMANN (J), (1954), E. E., R. U.S. Navy. USS Duncan, DDR-874, FPO San Francisco, Calif.
- RUDOLPH HERTZBERG, (1943), C. E., U.S. Corps of Engineers. 8019 Hickory St., New Orleans 18.
- JAMES K. HESS, (1946), C. E., R. Jones & Laughlin Steel Corp. P. O. Box 66, New Orleans 6.
- WILLIAM T. HESS, (1933), M. E., E. E., R. La. Power & Light Co., 142 Delaronde St., New Orleans 14.
- R. M. HETHERWICK, (1950), E. E., R. Southwest La. Electrical Membership Corp. 130 Azalea St., Lafayette.
- KEITH A. HETRICK, (J), (1951), C. E., City of Shreveport. 3404 Penick St., Shreveport, La.
- ELLIOT H. HEWES, (1955), C. E., R., 325 Amelia St., Lafayette.
- VICTOR C. HICKS, (1954), Aero. E. W. Horace Williams Co. 5537 Willow St., New Orleans.
- LOYLESS H. HIERS, (1946), M. E., R. New Orleans Public Service Inc., 317 Baronne St., New Orleans 9.
- OSCAR HIGGINBOTHAM, (1934), M. E., Compania Ingenios Azucareros Matanzas, S. A., Central Espana, Perica, Cuba.
- ARTHUR M. HILL, (1934), M. E., R., Dept. of Mechanical Engineering, Tulane University. 823 Pine St., New Orleans 18.
- G. H. HILL, (1947), E. E., Cities Refining Corp., 1900 Tenth St., Lake Charles.
- G. WILLIAM HILL, (1936), M. E., E. E. Westinghouse Electric & Mfg. Co. 2800 Audubon St., New Orleans 25.

- J. CLIFTON HILL, (1942), Ch. E., Esso Standard Oil Co. 2153 Broussard St., Baton Rouge.
- NEWTON HIMEL, (J), (1950), E. E., Central La. Electric Co., 528 Bank Ave. New Iberia, La.
- ROBERT O. HINCKLEY, (J), (1951), M. E., Active Military Duty. P. O. Box 333, Opelousas, La.
- H. JACK HINRICHS, (J), (1946), M. E., R., David W. Godat & Associates, 816 Howard Ave., New Orleans 13.
- CAMEL HOCTEL, JR., (A), Director of Safety, The Celotex Corp. 139 W. Henfer Park, New Orleans 23.
- EDWARD A. HODGE, (1948), Agricultural E. La. Power & Light Co. 508 Drago St., West Monroe.
- THOMAS L. HODGES, (1949), C. E., R., N. C., American Bitumuls & Asphalt Co. P. O. Box 1069, Mobile, Ala.
- FREDERICK J. HOFFMAN, (1952), Chemist & Engr. N. O. Public Service Inc., 1600 S. Peters St., New Orleans 13.
- GEORGE A. HOFFMAN, (A), (1954), Sagamo Electric Company. 5705 Canal Blvd. New Orleans 24.
- F. E. HOGAN, (1948), C. E., R. State of La. Dept. of Public Works, 5825 Chandler Dr., Baton Rouge.
- JOHN C. HOGE, (1950), F. E., R., Nebr., Wash. City of Lafayette Utilities System, Box 208, Lafayette.
- W. T. HOGG, (L. M.), (1913), C. E., R., Board of Commissioners, Port of New Orleans. 8000 Nelson St., New Orleans 18.
- TRUDEAU J. HOGUE, JR., (1949), E. E., R. Southern Bell Tel. & Tel. Co. 1215 Prytania St., New Orleans.
- JOSEPH A. HOLLAND, (1940), C. E., R. City of New Orleans. 1817 Valence St., New Orleans 15.
- C. W. HOLLENSHEAD, (1949), M. E., R. United Gas Pipe Line Co. Box 1407 Shreveport.
- T. F. HOLLENSHEAD, JR., (1950), C. E. United Gas Pipe Line Co. P. O. Box 229, New Braunfels, Tex.
- WARREN R. HOLLIER, (J), (1949), M. E., R., Central La. Electric Co., Inc. Box 1095, Lafayette.
- THOMAS C. HOLLIS, (J), (1953), C. E., R. La. State Dept. of Public Works. Rt. 2, Box 198-M, Lafayette, La.
- WALTER HOLLOWAY, (L. M.), (1923), E. E., R. Ala. Lt. Col., USAF, 34 Washington Ave., Ocean Springs, Miss.
- WILLIAM D. HOLLOWAY, (1945), Lubrication E., Gulf Refining Co. Box 400, New Orleans 1.
- RALPH S. HOLT, (1938), Testing E., R. S. Holt Testing Laboratory, 637 Tchoupitoulas St., New Orleans 12.
- LEO LEONARD HOLZENTHAL, (1946), Ch. E., M. E., R. Southern Region Research Laboratory. 303 Audubon Blvd., New Orleans.
- ROBIN M. HOOD, (1949), M. E., R. Shreveport Refrigeration Co., Inc. 633 McCormick St., Shreveport.
- PAUL F. HOOTS, (1927), New Orleans Public Service Inc., 317 Baronne St., New Orleans 9.
- FRANKLYN G. HORNSBY, (1945), E. E., Gulf States Utilities Co. 2010 Walnut St., Baton Rouge 7.
- WILLIAM F. HORRELL, JR., (1953), M. E., R., New Orleans Public Service Inc., 317 Baronne St., New Orleans 9.
- WALTER G. HORSTMAN, (1947), Ch. E. Plantation Pipe Line Co., Box 1743, Atlanta 1, Ga.
- JOHN R. HORTON, (1949), M. E., La. Power & Light Co., 142 Delaronde St., New Orleans 14.
- S. E. HOTTINGER, JR., (1932), M. E., E. E., R., La. Rating and Fire Prevention Bureau. 70 Hawk St., New Orleans 24.
- FRANK S. HOUGHTON, (1946), M. E., Standard Oil Co. of La. 430 Westmoreland Drive, Baton Rouge.
- DAVID H. HOVEY, (1954), E. E., R. La., Miss. Consulting Engineer. 3170 Florida St., Baton Rouge.
- HENRY G. HOWARD, (1952), C. E., R., La., Me., Vt. Bedell & Nelson. 611 Hyman Drive, New Orleans 21.
- LEWIS B. HOWE, (J), (1951), C. E., R., La. Dept. of Highways, P. O. Box 126, Minden, La.

- WILLIAM M. HOWE, (J), (1950), E. E., Container Corp. of America. 2410 N.W. 25th, Fort Worth 6, Texas.
- ROBERT E. HOWSON, (J), (1953), C. E., Military Road, Covington, La.
- CHARLES P. HOYT, (1945), M. E., R. Esso Standard Oil Co., P. O. Box 864, Baton Rouge 1.
- RICHARD H. HUDSON, JR., (1950), M. E., Esso Standard Oil Co., 4723 Sweetbriar St., Baton Rouge 15.
- GEORGE O. HUET, (1949), Naval Architect, Marine E., 5635 Milne St., New Orleans 24.
- JAMES T. HUEY, (1939), C. E., M. E., R., La. Dept. of Highways. 678 North 5th St., Baton Rouge 2.
- STANTON ENNES HUEY, (1937), C. E., R., S. E. Huey & Co. Henninger Bldg., Monroe, La.
- JOHN G. HUFFMAN, (1949), Surveyor, Mid-States Mapping Service. 222 Kirby Place, Shreveport.
- JOHN H. HUFFMAN, (A), (1952), Petroleum E., R., United Gas Corp. Rt. 3, Lakeshore Drive, Monroe.
- EDMUND F. HUGHES, (1933), C. E., R., Sewerage and Water Board, 526 Carondelet St., New Orleans 12.
- GEORGE GRIFFIN HUGHES, (1948), M. E., C. E., R., College of Engineering. Southwestern La. Institute. Box 51, S.L.I., Lafayette, La.
- WILLIAM J. HUGHES, (1943), C. E., R. La. Dept. of Highways. 2265 Ferndale Ave., Baton Rouge 15.
- CHARLES H. HUNDEMER, (1947), M. E., R. Gaylord Container Corp., 806 N. Border Drive, Bogalusa, La.
- DONALD G. HUNTER, (1951), E. E., R. City of Alexandria. City Hall, Alexandria, La.
- JOHN H. HUNTER, (1950), C. E., P.O. Box 525, Clemson, S. C.
- MALCOLM L. HURSTELL, (J), (1950), E. E., R., N. O. Public Service Inc. 4900 Kendall Drive, New Orleans 22.
- A. E. HUTCHINSON, (1947), C. E., M. E., Ethyl Corp. Rt. 2, 8255 Old Hammond Hwy. Baton Rouge 1.
- MILES B. HUTSON, (1949), E. E., R. Industrial Electric, Inc. 321 Hillary St., New Orleans 18.
- HENRY I. HUTTO, (1954), E. E., R. Chemical Construction Corp. 4075 River Road, Westwego, La.
- OLLIE L. HYDE, (A), (1950), E. E., R., Central La. Electric Co. 123 Fairmount St., Pineville, La.

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- CLARENCE A. IBACH, (1944), M. E., Gulf States Utilities. P. O. Box 111, Baton Rouge.
- ORVILLE T. ICE, JR., (1949), Petroleum E., R., Rosett Engineering Service. 522 Egan St., Shreveport.
- JOHN L. ILES, (A), (1951), Sales E., La. Metal Culvert Co., Box 4281, Centenary Sta., Shreveport.
- JAMES F. ILGENFRITZ, (J), (1949), M. E., R. Boyce-Harvey Machinery, Inc. P. O. Box 10158, New Orleans 21.
- THEODORE J. INNES, JR., (1949), M. E., Esso Standard Oil Co. 5608 Castile Ave., Baton Rouge 6.
- FRANK W. IRLAND, (1955), M. E., R. Mo. Libbey-Owens-Ford Glass Co., Shreveport.
- IRWIN ISAACSON, JR., (J), (1947), M. E., E. E., R. Leo S. Weil & Walter B. Moses. 600 Audubon Bldg., New Orleans 16.
- C. A. IVES, (L.M.), (1922), C. E., R., Esso Standard Oil Co. 940 Park Blvd., Baton Rouge 11.

J

- A. D. JACKSON, (1939), C. E., R. La. Dept. of Highways, Baton Rouge, La.
- ALLEN S. JACKSON, E. E., R. Crouse-Hinds Co. 205 Guava Drive, Baton Rouge.
- CLARENCE A. JACKSON, (1949), M. E., Jackson Const. Co. Box 623 Sulphur, La.
- O. D. JACKSON, (1951), M. E., R. United Gas Pipe Line Co. Box 1407, Shreveport.

- ERNEST LEE JAHNCKE, (L. M.), (Jan. 1, 1900). Retired. 726 West Beach, Pass Christian, Miss.
- PAUL F. JAHNCKE, (L. M.), (Jan. 1, 1908), C. E., R. Jahncke Service, Inc. 814 Howard Ave., New Orleans 4.
- JAY M. JALENAK, (1955), M. E., R. Jalenak Engineering Co., 2124 Magazine St., New Orleans 13.
- E. JOE JAMES, (1942), C. E., R. La. Dept. of Highways. Box 4245, Capitol Sta. Baton Rouge 2.
- HARDY M. JAMES, (1950), M. E., R. James Machine Works, P. O. Box 1296, Monroe, La.
- ROBERT B. JAMES, (1953), M. E., E. E. New Orleans Public Service Inc. 2838 Iberville St., New Orleans.
- JAMES S. JANSSEN, (1933), C. E., M. E., R. New Orleans Public Service Inc. 317 Baronne St., New Orleans 9.
- JOSEPH EDMUND JARMAN, (1942), C. E., R. La. Department of Highways. 134 Memory Lane, Lafayette, La.
- NEILL P. JEFFREY, JR., (1943), C. E., R., A. W. Thompson & Associates. 6306 Beauregard Ave., New Orleans 24.
- RAYMOND E. JENKINS, (1948), E. E., M. E., R. Southwestern La. Institute. P. O. Box 64, S.L.I. Lafayette.
- JOHN M. JENNY, JR., (1954), M. E., R. Edwards Engineering Corp., 715 Camp St., New Orleans 12.
- ALLEN H. JENSEN, (1947), M. E., R. La., Ill. N. O. Public Service Inc. 1600 S. Peters St., New Orleans 13.
- D. W. JESSEN, (1953), C. E., R. Private practice. Room 5, Roumain Bldg., Lake Charles
- GEORGE T. JOHNS, (J), (1953), C. E., R. La. Dept. of Public Works. P. O. Box 701, Tallulah, La.
- CLIFFORD E. JOHNSON, (1953), C. E., R. La. Dept. of Highways. P. O. Box 226, New Iberia, La.
- EVERETT K. JOHNSON, JR., (J), (1953), C. E. 1944 Dublin St., New Orleans 18.
- FRANK E. JOHNSON, JR., (1937), E. E., R., New Orleans Public Service Inc., 317 Baronne St., New Orleans 9.
- LEE H. JOHNSON, Jr., (1950), C. E., R., Tulane University, P. O. Station 20, New Orleans 18.
- LESLIE M. JOHNSON, (1955), M. E., Esso Standard Oil Co. 8847 Airline Highway, Baton Rouge 6.
- MILTON R. JOHNSON, JR., (1948), E. E., R. La. Polytechnic Institute. 808 Robert St., Ruston, La.
- O. D. JOHNSON, JR., (1951), E. E., M. E., R., Esso Standard Oil Co. 4312 Shelley St., Baton Rouge 5.
- RICHARD L. JOHNSON, (J), (1950), M. E. P. O. Box 304, Shreveport.
- ROY E. JOHNSON, (1943), C. E., R. H. H. Robertson Co., 1020 Maritime Bldg., New Orleans 12.
- WILLIAM J. JOHNSON, JR., (1947), C. E. U.S. Corps of Engineers, New Orleans District. 536 North Market St., Opelousas, La.
- SAMUEL R. JOHNSTON III, (J), (1952), Surveyor. J. C. McLemore. 3962 Sumner St., Shreveport.
- WILLIAM H. JOHNSTON, (J), (1945), M. E., R., F. N. Johnston, Inc., 236 Humble Bldg., New Orleans 25.
- EDWARD M. JOLLY, (J), (1950), M. E., R., E. M. Freeman and Associates. Rt. 4, Box 857-B, Shreveport, La.
- C. LEONARD JONES, (L.M.), (1923), C. E., R., Board of Commissioners Port of N. O. 27 Maryland Drive, New Orleans 20.
- C. PALMER JONES, (1954), M. E., R. McLellan Equipment Co., 2375 Tchoupitoulas St., New Orleans 13.
- FRANK W. JONES (1953), E. E., R. La., Tex. Gulf States Utilities Co. 4143 Fairfields Ave., Baton Rouge.
- JOHN P. JONES, (J), (1952), M. E., R., Ogden & Woodruff, Consulting Engrs. 1645 Nicholson Drive, Baton Rouge.
- SARGENT F. JONES, (1940), C. E., R. 5422 Prytania St., New Orleans 15.
- JOHN CHARLES JORDY, (A), Acoustical & Insulation Contractor, Lauren, Burt, Inc. 1645 Locust St., Denver, Colo.
- CHARLES E. JOUBERT, (L.M.), (Jan. 1, 1909), C. E., 823 S. Claiborne Ave., New Orleans.
- E. M. JULIAN, (1951), C. E., Standard Dredging Corp., Box 8092, Gentilly Sta., New Orleans 22.
- RALPH W. JUNIUS, (J), (1952), Architect, Boh Bros. Const. Co., 2400 Cypress St., New Orleans 19.

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- TED H. KALENCKI, (1952), M. E., E. E., R., Garlete Pump & Well Supply Co., Inc. Rt. 2, Jackson, La.
- KARL P. KAMMER, (1931), M. E., R. New Orleans Public Service, Inc. 317 Baronne St., New Orleans 9.
- NOEL P. KAMMER, (1936), Architectural E., General Earthwork Service. 3527 Carondelet St., New Orleans 15.
- W. J. KEATING, (A), (1946), E. E., E. Levy & Co. P. O. Box 1845, Alexandria.
- HAROLD L. KEATON, (1951), Ch. E., R. Gaylord Container Corp. 906 Florida Ave., Bogalusa, La.
- THOMAS H. KEEN, (1954), E. E. Graybar Electric Co. 727 St. Louis St., Lafayette.
- ARTHUR R. KEILER, (1940), Chief Inspector, Hartford Steam Boiler Inspection and Insurance Co. 519 Hibernia Bank Bldg., New Orleans 12.
- MIKE KELLEHER, (1954), M. E., E. E., R. Kelleher Engineering Corp., 3721 St. Charles Ave., Apt. A, New Orleans 15.
- CHARLES KELLER, JR., (1946), M. E., R. Keller Construction Corp. P. O. Box 439, New Orleans 1.
- G. HARVEY KELLERMAN, (1954), E. E. General Electric Company. 837 Gravier St., New Orleans 12.
- CLAUDE J. KELLY, (1936), C. E., N. O. Cement Products Co., Inc. 4139 Walmsley Ave., New Orleans 15.
- CLAUDE KELLY, JR., (J), (1953), C. E., R. N. O. Cement Products Co., Inc. 2900 Perdido St., New Orleans 19.
- JOSEPH E. KELLY, (J), (1952), M. E., R., J. B. Beaird Co., Inc. 217 Russell St., Shreveport.
- CHARLES MACDONALD KERR, (L. M.), (1913), C. E., R. 5831 S. Robertson St., New Orleans 15.
- GERALD C. KERR, (1937), Acoustical E., Johns-Manville Co., P. O. Box 1050, New Orleans 11.
- JAMES F. KERR, (1953), C. E., R., Tex., Missouri Pacific Lines. 242 E. Bertheaud Ave., Opelousas, La.
- ROY C. KETCHUM, (1950), C. E., 8th Naval Dist., U.S. Navy. 106 Finland Place, New Orleans 14.
- JAMES M. KIDD, JR., (1954), C. E., M. E., R. Esso Standard Oil Co., Baton Rouge.
- WILLIAM E. KIDD, (J), (1953), B. E., U.S. Army, active duty. 96th Ord. Co., Fort Bliss, El Paso, Texas.
- BERNARD L. KIERNAN, JR., (1944), M. E., E. E., R., National Gypsum Co. Box 5257-B, New Orleans 15.
- BERNARD L. KIERNAN, SR., (1944), M. E., E. E., R. Jackson Brewing Co. & Kay Engineering Co. 1622 Mirabeau Ave., New Orleans 22.
- ELLIS M. KILLGORE, (1954), M. E., R. La. Polytechnic Institute. Box 12, Tech Station, Ruston, La.
- JAMES L. KILPATRICK, (J), (1953), Pet. E. U.S. Navy. 7773 E. National, Millington, Tenn.
- CLIFFORD A. KING, (A), (1948), Contractor. 219 Dryades St., New Orleans 12.
- HERBERT M. KING, JR., (J), (1951), E. E., Brown-Roberts Electric Co., 122 Cook Ave., Alexandria, La.
- WILLIAM F. KING, (J), (1951), M. E., E. E., R. James M. Todd & Associates. 2120 Audubon St., New Orleans 18.
- KENNETH LEE KINNEY, (1951), M. E., R. Esso Standard Oil Co. 3121 Eugene St. Baton Rouge 6.
- O. G. KIRBY, (1940), C. E., R. W. R. Aldrich & Co., P. O. Box 1751, Baton Rouge, La.
- THOMAS W. KIRBY, (1947), Chemist, Cities Service Refining Corp. 1704 Bryant Court Drive, Lake Charles.
- MILTON E. KIRKPATRICK, JR., (1948), M. E., R., La., Ala. E. I. Dupont deNemours Co., 638 Hutchinson Dr., North Augusta, S. C.
- LEONARD R. KIRST, (1929), C. E., M. E., R., La. State Dept. of Public Works. 317 East Drive, Baton Rouge 6.
- JOHN T. KNIGHT, JR., (1904), M. E., R. La., Miss., Ala. Equitable Equipment Company, 410 Camp St. New Orleans 12.

- NATHANIEL B. KNIGHT, JR., (A), (1944), E. E., 916 Fourth St., Gretna, La.
 CHARLES P. KNOST, (1944), E. E., R. Moloney Electric Company. 4018 Thalla St., New Orleans 25.
 MARION F. KNOST, (1946), M. E., Gulf Refining Co. P.O. Box 400, New Orleans, La.
 RICHARD B. KOHNKE, (L. M.), (1911), C. E., R. City of New Orleans. 932 Picheloup Place, New Orleans 19.
 STANLEY P. KOLTUN, (J), (1952), Ch. E., R., Southern Research Laboratory. 1013 Pine St., New Orleans 18.
 LOUIS I. KORN, (1933), M. E., E. E., R. U.S. Navy. Algiers Naval Station, Bldg. 263. New Orleans 14.
 J. I. KOTTER, (J), (1951), M. E., 2916-49th St., Metairie, La. Ave., Baton Rouge.
 HAROLD F. KRAUS, (J), (1950), E. E., R., U.S. Navy. 6100 Pontchartrain Blvd. New Orleans 18.
 FREDERICK KRING, JR., (1948), M. E., Esso Standard Oil Co. 628 Audubon Ave., Baton Rouge, La.
 S. HENRY KRONTHAL, (1950), Architectural E., Rust Eng. Co. 6007 Beldart St., Houston 21, Tex.
 EMILE S. KROUSE, JR., (J), (1952), Agri. E., R., Gulf States Utilities Co. 340 Florida St., Baton Rouge.
 PAUL P. KRUTAK, (1935), E. E., Westinghouse Electric Corp. 1226 Whitney Bldg., New Orleans.
 ROBERT J. KUHN, (L.M.), (1925), E. E., M. E., R., La., Ky., Tenn., Miss., Ind. Consulting Engineer, 1642 Octavia St., New Orleans 15.
 MARSHALL F. KULL, (1954), M. E., R. Smith & Padgett, Architects. 1017 Audubon Ave., West Monroe.
 A. R. KUZEL, (1950), M. E., R., La. Dept. of Highways. 5836 Fairfield Ave., Baton Rouge.

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- CHARLES F. LACK, (1950), C. E., R. La., N. Mex. Neild & Somdal. 1040 Kings-highway, Shreveport.
 EDWIN A. LAFAYE, M. E., R., Murray-Baker-Frederic, Inc. 234 Humble Bldg. New Orleans 25.
 PAUL M. LAGARDE, (1947), C. E., R., Standard Fruit & S. S. Co., LeCeiba, Honduras.
 THEODORE J. LALA, (J), (1951), M. E., R., Hepinstall Steel Works. P. O. Box 1422 New Orleans.
 GEORGE B. LAMBERT, JR., (1939), Engineer, M. T. Reed Construction Co. Mississippi City, Miss.
 ALBERT F. LANDERS, (1953), M. E., E. E., American Locomotive Co. 128 W. Henfer Park, New Orleans 23.
 EARLE A. LANDRY, (1942) C. E., R., La. Dept. of Highways. 327 Commerce Ave., Port Allen, La.
 HENRY LOUIS LANDRY, (1942), E. E., R. Gulf States Utilities Co., 2222 Cedardale Ave., Baton Rouge.
 LOUIS C. LANDRY, JR., (1950), E. E., M. E., R., United Gas Corp., New Iberia, La.
 WALTER A. LANDRY, JR., (J), (1950), M. E., R. National Gypsum Co., 5300 Tchopuitoulas St., New Orleans.
 HERRICK J. LANE, (L.M.) (1929), C. E., W. Horace Williams Co. 833 Howard Ave., New Orleans 12.
 HERRICK J. LANE, JR., (1946), C. E., W. Horace Williams Co., 1206 Nashville Ave., New Orleans 15.
 EDMOND J. LANGHETEE, JR., (J), (1951), Petroleum E., R. La. Land & Exploration Co., 1900 American Bank Bldg., New Orleans 12.
 JOHN E. LANGLEY, (1951), M. E., R., Esso Standard Oil Co. 1812 Ingleside Dr., Baton Rouge, La.
 CHARLES K. LANGLINAIS, (1955), Surveyor, R. Private practice. P. O. Box 184, Broussard, La.
 WILLIAM J. LANK, (1949), C. E., R. Kansas City Southern Ry. Co. (Retired) 171 Albert St., Shreveport.
 N. E. LANT, (H.M.), (1937), C. E., R. La. Dept. of Highways, Baton Rouge, La.

- FERNAND S. LAPEYRE, (1948), M. E., E. E., R., The Peelers Co., 635 S. Peters, New Orleans 4.
- WILLIAM M. LARKIN, (1944), E. E., Gulf States Utilities, Lake Charles.
- FERDINAND L. LARUE, JR., (1954), Ch. E., Southwestern Louisiana Institute. 435 N. Sterling St., Lafayette.
- LEO J. LASSALLE, (1936), (H.M.), C. E., M. E., R., La. State University and A & M College, University Station, Baton Rouge 3.
- DOUGLAS F. LATIMER, (1946), M. E., C. E., Gulf States Utilities Co., P. O. Box 2431, Baton Rouge.
- JOHN A. LAURENT, JR., (J), (1946), E. E., 1941 Congress St., New Orleans.
- ROBERT D. LAW, JR., (J), (1950), C. E., R. La. Dept. of Highways, 980 Carrollton Ave., Baton Rouge.
- RICHARD H. LAWTON, SR., (1954), Gulf States Utilities Co. 340 Florida St., Baton Rouge.
- WHITMEL E. LAZARUS, J), (1951), E. E., Westinghouse Electric Corp. 141-B Fir St., Park Forest, Ill.
- MAXWELL A. LEA, (1948), M. E., R. Ethyl Corp., 3970 100-Oaks Ave., Baton Rouge 6.
- W. STONE LEAKE, (1934), E. E., R., General Electric Co. 1004 Richard Bldg., New Orleans 12.
- H. A. LeBLANC, JR., (1947), Ch. E., Shell Oil Co., Inc., Norco, La.
- OWEN V. LEBLANC, (1944), C. E., R., W. Horace Williams Co., 6480 Argonne St., New Orleans 24.
- WHARTON A. LEBLANC, (1948), Agricultural E., M. E., R., General Gas Corp. Box 2271, Baton Rouge.
- WENDEL J. LECHTENBERG, (J), (1944), E. E., Mathieson Chemical Corp. 3721 Vanderbilt St., Lake Charles.
- STANLEY M. LECOURT, (1933), C. E., M. E., R., Mississippi Shipping Co., Inc. 920 Picheloup Place, New Orleans 19.
- J. McLEAN LeDOUX, (1945), E. E., National Electric Products Corp. 629½ Baronne St., New Orleans 12.
- CLARENCE O. LEE, (1944), Mining E., R., Freeport Sulphur Co. P. O. Box 1520, New Orleans 5.
- ROBERT E. LEE, JR., (J), (1951), M. E., Esso Standard Oil Co. 3124 Tyrone Dr., Baton Rouge 6.
- PERSHING J. LEFORT, (J), (195), M. E., Southern Production Drilling Co., Inc., P. O. Box 66, Galliano, La.
- RANDALL F. LEGEAI, (L.M.), (1923), E. E., R., New Orleans Public Service Inc. 3824 Nashville Ave., New Orleans 15.
- WALTER C. LEHIGH, (A), (1950), Shell Oil Co., P.O. Box 673, New Orleans 7.
- A. J. LEHMAN, (1948), E. E., R., La., Texas, Freeport Sulphur Co., Box 187. Port Sulphur, La.
- H. L. LEHMANN, (1937), C. E., R. La. Dept. of Highways, Baton Rouge, La.
- WENDEL G. LEIBE, (1948), M. E., R., City of N. O., Dept. of Mech. Inspection. 426 S. Jefferson Davis Parkway, New Orleans 19.
- HAROLD F. LEIENDECKER, (J), (1955), C. E., Esso Standard Oil Co. 664 Vernon St., Baton Rouge, La.
- HENRY F. LeMIEUX, (J), (1951), C. E., E. E., R. Raymond Concrete Pile Co. 201 Pere Marquette Bldg., New Orleans 12.
- GEORGE P. LEMOINE, (1950), Ch. E. Lemoine Bros. P. O. Box 298, Bunkie, La.
- JAMES A. LEMOINE, (1952), M. E., Lemoine Bros., Box 298, Bunkie, La.
- LEON C. LEONARD, (J), (1953), M. E., R., A. M. Lockett & Co., Ltd., 4630 St. Charles Ave., New Orleans 15.
- FRED E. LESHE, (1950), C. E., Cities Service Refining Corp. 18 Poinsettia Road, Maplewood, La.
- HAROLD A. LEVEY, SR., (1936), Ch. E., M. E., E. E., R. La., Texas. American Products Mfg. Co., Inc. 8127-33 Oleander St., New Orleans 18.
- DAVID J. LEVINE, (J), (1952), M. E., R., Equitable Equipment Co. Inc. 410 Camp St., New Orleans 12.
- ERNEST LEE LEVINGSTON, (1954), C. E., Cities Service Refining Corp. 2005 Fourth St., Lake Charles.
- ALLISON M. LEVY, (1944), M. E. de Laoreal & Moses. 208 DeSoto Bldg., Pensacola, Fla.

- DAVID P. LEVY, (1950), M.E., E.E., R., Equitable Equipment Co. 410 Camp St., New Orleans 12.
- EUGENE LEVY, (A), (1946), E. Levy & Co., Electrical Contractors. 530 Murray St., Alexandria.
- MILTON L. LEVY, (1946), E.E., R. Higgins Inc., 5673 West End Blvd., New Orleans 24.
- NEVILLE LEVY, (1929), M.E., E.E., R. Equitable Equipment Co., Inc. 410 Camp St., New Orleans 12.
- WILLIAM L. LEWIS, (J), (1954), Esso Standard Oil Co. 1767 Ormandy St., Baton Rouge.
- HOWARD B. L'HEUREUX, (1951), C.E., R., Howard L'Heureux & Associates. 720 Murray St., Alexandria.
- HUGH A. LILES, (1954), M.E., R. Allied Sales & Service Co. 4376 State Street Drive, New Orleans 25.
- RALPH E. LIND, (1930), C.E., R. 6624 Louis XIV St., New Orleans 24.
- ARCHIE C. LINDSAY, JR., (A), (1950), C.E., R. City of Shreveport. 2515 James St., Shreveport.
- R. P. LINFIELD, (1930), C.E., R. 7715 Burthe St., New Orleans 18.
- WILLIAM A. LOCHTE, (1945), M.E., American-South African Steamship Co. 7021 Hickory St., New Orleans 18.
- ROBERT P. LOCKETT, (A), (1931), M.E., R. A. M. Lockett & Co. 308 Whitney Bldg., New Orleans 7
- ROBERT P. LOCKETT, JR., (1947), M.E., R. A. M. Lockett & Co., 308 Whitney Bldg., New Orleans 7.
- T. BENBURY LOCKETT, (1949), M.E., R., Standard Supply & Hardware Co., 2130 Palmer Ave., New Orleans 18.
- Z. L. LOFLIN, (1952), M.E., Ch.E., R., Southwestern Louisiana Institute. Box 353, S.L.I. Station, Lafayette.
- GEORGE L. LOGAN, (1948), Petroleum E., R., Lyons, McCord & Logan. 404 Texas-Eastern Bldg., Shreveport.
- JOHN S. LOGAN, (1949), Highway E., U.S. Bureau of Public Roads. 416 East Drive, Baton Rouge 6.
- ADRIAN L. LONG, (J), (1954), C.E., R. Gulf Refining Co., Southern Pipe Line Div., Box 1731, Shreveport.
- JAMES C. LORIO, (J), (1954), E.E., R. La. Dept. of Highways. 2304 Hiawatha St., Baton Rouge.
- JULES A. LORIO, (L.M.), (1921), M.E., Dibert, Bancroft & Ross Co., Ltd. 7420 Benjamin St., New Orleans 18.
- STAVROS D. LOUCHIS, (1951), M.E., R., Kaiser Aluminum & Chemical Corp., 5138 Cameron Blvd., New Orleans 22.
- ALFRED J. LOUP, JR., (1949), C.E., R. Dunham Wilson Co. 2349 Edgewood Drive, Baton Rouge.
- L. A. LOUSTALOT, (L.M.), (1931), C.E. Guaranty Bank & Trust Co., Hammond, La.
- BERNARD LOUVIERE, (1949), M.E., R., Creole Engineering Co. P. O. Box 12115, New Orleans 24.
- M. CONWAY LUSK, (J), (1954), C.E., R. La. State Highway Dept. 1945 Bay St., Baton Rouge 2.
- KENNETH E. LUTZ, (1954), M.E., R. Esso Standard Oil Co. 2320 Nicholson Drive, Baton Rouge.
- A. A. LYONS, (1949), C.E., R., City of Shreveport. 659 Rutherford St., Shreveport.
- BYRON PHELPS LYONS, (1949) (C.E., R., La. Dept. Public Works, 614 Drehr Ave., Baton Rouge.
- VAL A. LYONS, (1949), C.E., R., E. M. Freeman & Associates. 228 E. Wilkinson St., Shreveport.

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- DANIEL P. MABEL, (1945), E.E., Anaconda Wire & Cable Co. 601 Hibernia Bldg., New Orleans 12.
- AUBON L. MABRY, (1947), C.E., U.S. Navy Dist. Public Works Office. 101 Larchmont Place, New Orleans 14.
- FRANK W. MACDONALD, (1933), C.E., R., Tulane University, New Orleans 18.
- WALLACE RAY MACK, (1942), C.E., R. La. Department of Highways. Box 555, Oakdale, La.

- KENNETH W. MACKENZIE, (1939), Testing Engineer, Construction Materials Laboratory, 624 Atchley St., Knoxville, Tenn.
- RAYMOND P. MADDUX, (J), (1953), M. E., Combustion Engineering, Inc. P. O. Box 288., Parsons, Kansas.
- ROBERT W. MAESER, JR., (1954), Ch. E. Ethyl Corp. 655 Ursuline Drive, Baton Rouge 2.
- LEONARD F. MAGEE, (1951), E. E., R. City of Alexandria. 2425 Elliot St., Alexandria.
- LELAND S. MAJOR, (1953), M. E., Esso Standard Oil Co. 4511 Highland Road, Baton Rouge.
- JOHN S. MALAHY, JR., (1951), M. E., E. E., R., La., Tex., Miss. Hadra & Malahy, 1839 Line Ave., Shreveport.
- JOHN J. MALARKEY (A), (1952), Draftsman. Matheison Chemical Corp. 1606 Sixth St., Lake Charles.
- JOHN F. MALLETT, (1943), C. E., R., La. Dept. of Highways. Rt. 2, Box 293 Monroe, La.
- JOHN D. MALONE, JR., (1937), E. E., New Orleans Public Service, Inc. 317 Baronne St., New Orleans 9.
- LAWRENCE MANN, JR., (J), (1952), M. E., R., Esso Standard Oil Co. Box 551, Baton Rouge.
- LOUIS B. MANN, (J), (1952), M. E., Louisiana Motors. Box 534, Lafayette.
- H. H. MANNER, JR., (1947), Architectural E., La. Metal Culvert Co. Box 2427, Baton Rouge 2.
- JOHN F. MANSON, (1951), C. E., R. P. Farnsworth Co., Inc. Box 850, New Orleans.
- S. KENAN MANSON, JR., (1942), C. E., R., King & Co., Inc. 401 Park Road, New Orleans 20.
- MICHAEL J. MARCHESE, (1948), E. E., R. U.S. Navy. 1716 St. Roch Ave., New Orleans 17.
- WARREN E. MARCUM, (A), (1952), C. E., R., La. Dept. of Highways. 2045 North 17th St., Baton Rouge.
- GODFREY I. MARINE, (J), (1951), E. E., R., Marine Electric Co. 114 E. Congress St., Lafayette.
- WILLIAM M. MARLIN, (J), (1953), E. E., Cities Service Refining Corp. 645 Clarence St., Lake Charles.
- HAROLD O. MARQUART, (1943), C. E., Gaylord Container Corp., Mill Div. 330 N. Border Drive, Bogalusa, La.
- GORDON A. MARSALIS, (1951), C. E., R. Industrial Steel Products Co., Inc., P.O. Box 1814, Shreveport.
- HARVEY J. MARTIN, (J), (1954), E. E., N. O. Public Service Inc. 1600 South Peters St., New Orleans 13.
- PAUL G. MARTIN, (1954), C. E., R. La., Kan. Burgwin & Martin. 406 W. 7th St., Topeka, Kansas.
- JOHN L. MARTINEZ, (1947), M. E., R. Tulane University. 12 Fontainebleau Drive, New Orleans 18.
- HIRAM RUSSELL MASON, (1945), E. E., R. Southwestern Louisiana Institute. 204 Stephens St., Lafayette, La.
- SEBASTIAN V. MASSIMINI, (1931), M. E., Gulf Engineering Co. Inc. 1000 S. Peters St., New Orleans 13.
- WILLIAM A. MASSIMINI, (J), (1950), M. E., R. Gulf Engineering Co., 1000 S. Peters St., New Orleans 13.
- ALLEN J. MATHERNE, JR., (1943), E. E., Gulf States Utilities Co. 41 Eucalyptus Road, Maplewood, La.
- EMMETT LEE MATHEWS, JR., (J), (1949), E. E., City of Alexandria. Route 2, Box 21, Alexandria.
- GEORGE F. MATTHES, (1953), M. E., E. E., R. Louisiana State University, Baton Rouge 3.
- ARNOLD CARL MATTHIES, (1945), Ch. E., Esso Standard Oil Co. 18 Dunnder Drive, Summit, N. J.
- E. D. MATTIX, (1947), Ch. E., Cities Service Ref. Corp. 1616 Seventh St., Lake Charles.
- GEORGE ELMER MAY, (1940), M. and E. E., N. O. Public Service Inc. 2031 Short St., New Orleans 18.
- JOHN K. MAYER, (1933), M. E., C. E., E. E., R. College of Engineering, Tulane University. 2419 Audubon St., New Orleans 25.
- WILLIAM G. MAYER, (J), (1950), C. E., R. La. Dept. of Highways. 301 Westfield, Bossier City, La.

- CHARLES J. MAYEUX, JR., (1947), C. E., R. Gaylord Container Corp. 906 North Border Drive, Bogalusa, La.
- PAUL J. MAYNE, (1955), C. E., R. La., Fla. Private practice. 1401 Cherokee Drive, Opelousas, La.
- JOHN F. MAYS, (1937), C. E., U.S. Corps of Engrs., N. O. Dist. 1407 First St., New Orleans 13.
- JOHN E. McADAM, (1949), E. E., R. Dixie Electric Membership Corp. 381 Finchley Drive, Baton Rouge.
- SAMUEL H. McAFEE, JR., (1950), M. E., New Orleans Public Service Inc. 2838 Iberville St., New Orleans 19.
- CHARLES R. McBRIDE, JR., (1950), M. and E. E., Firestone Tire & Rubber Co., P. O. Drawer 1361, Lake Charles.
- ROBERT R. McBRIDE, JR., (J), (1954), C. E. Bonded Roofing & Specialty Co. 508 E. Vermillion St., Lafayette.
- JOHN I. McCAIN, C. E., R. McCain & Associates. 8200 Florida St., Baton Rouge.
- JOHN C. McCAMPBELL, (1952), Geologist. Southwestern La. Institute, Box 326, SLI, Lafayette.
- A. HEWS McCANN, (1946), Architect, C. E., R., La., Ia., Ill. Partner, McCann, Prout & Associates. 410 Howes Bldg., Clinton, Iowa.
- DANIEL B. McCARTY, (1951), C. E., Surveyor, R. La. Dept. of Highways. 1618 Louisiana St., Covington, La.
- MARVIN R. McCARTY, (1954), M. E., Johns-Manville Sales Corp. P. O. Box 7072, Mid City Station, New Orleans.
- R. A. McCLENAGHAN, (1949), C. E., R. La., Tex. Self employed. P. O. Box 4326, Shreveport.
- ROBERT C. McCLURE, (J), (1954), C. E. 6162 Louis XIV St., New Orleans 24.
- RALPH H. McCOLLISTER, (1954), C. E., R. Esso Standard Oil Co. 2829 Tecumseh St., Baton Rouge.
- S. LOGAN McCONNELL, (1947), C. E., M. E., E. E., R. La., Miss. City of New Orleans, Howard Annex, 537 St. Charles, New Orleans 12.
- ALEGANDER McCOOL, (J), (1950), Hydraulic E. Address unknown.
- LUTHER D. McCORQUODALE, (1942), C. E., R., La. Dept. of Highways, 1007 S. Division St., Lake Charles.
- WILLIAM R. MCCOY, (1953), C. E., R. U.S. Army Corps of Engineers. 1101 S. 8th St., Monroe.
- JAMES P. McCULLOUGH, (1938), Ch. E., United Gas Pipe Co. P. O. Box 1407, Shreveport, La.
- THOMAS J. McDANIEL, (1951), E. E., Gaylord Container Corp. Route 3, Box 67, Bogalusa, La.
- HENRY E. McDOWELL, (1951), C. E., U.S. Army Corps of Engineers. 2714 W. Calvert, Shreveport.
- WALTER H. McELROY, (A), (1954), Southern Bell Tel. & Tel. Co. 825 Murray St., Alexandria, La.
- WILLIAM E. McFARLAND, (1953), Ch. E., M. E., R. Henderson Sugar Refinery, Inc., 1136 Washington Avenue, New Orleans 13.
- J. LUCIUS McGEHEE, (J), (1949), M. E., E. E., R. Delta Bag Co. Inc., 218 Pine St., New Orleans 18.
- HARRY F. McGOWEN, JR., (A), (1951), Research Machinist. United Gas Corp. 241 Roman Drive, Shreveport.
- DEAN C. McKEE, (J), (1952), C. E., R., Ruckstuhl & Fisk, Inc., Contractors. 3624 Geronimo St., Baton Rouge.
- PAUL A. McKIM, (1944), Ch. E., Ethyl Corp. 630 Delgado Drive, Baton Rouge 2.
- JAMES R. McKINLEY, (1954), E. E., R. Southern Bell Tel. & Tel. Co., 104 Rochelle Ave., Monroe.
- MARC McKINLEY, (A), (1947), E. E., 1316 Ford St., Lake Charles, La.
- GEORGE E. McLEAN, (J), (1953), Aero. Eng. Gulf Engineering Co., Inc. 1000 S. Peters St., New Orleans 13.
- LEAL C. H. McLEAN, (1933), M. and E. E., Jones & Laughlin Steel Corp. P. O. Box 66, New Orleans 6.
- EDWARD A. McLELLAN, (1938), M. E., R. McLellan Equipment Co. 2375 Tchoupitoulas St., New Orleans 13.
- JESSIE C. McLEMORE, (1949), Surveyor, R., Private practice. 520 First National Bank Bldg., Shreveport.

- GEORGE C. McMILLEN, (1951), Mining E., R., La., Tex. Freeport Sulphur Co., 1500 American Bank Bldg., New Orleans.
- EDWARD J. McNAMARA, (1937), C. E., R. Freeport Sulphur Co., 308 Dunboyne Place, Thibodaux, La.
- FRANK P. McNAMARA, (J), (1949), C. E., R. Cities Service Refining Corp. 425 Phillips St., Sulphur, La.
- JOHN E. McNAMARA, (1950), Radio E. General Electronic & Engineering Service Corp. 601 South Crocker St., Sulphur, La.
- ERNEST W. McNEIL, JR., (1948), E. E., Esso Standard Oil Co. 1449 Rosemont Drive, Baton Rouge 6.
- NEIL McNELIS, (1949), C. E., R., The Carter Oil Co., 212 E. Elmwood St., Shreveport, La.
- E. S. McROBERTS, (1949), M. E., R. The J. B. Beaird Co., Inc. 6114 Henderson St., Shreveport 41.
- WILLIAM E. McWHIRTER, JR., (J), (1951), Ch. E., R., Pan Am Southern Corp. 23 Santa Ana Ave., New Orleans 21.
- GEORGE P. MEADE, (1936), Ch. E., Colonial Sugars Co., Gramercy, La.
- ALLAN G. MEAKIN, (1950), Ch. E. Esso Standard Oil Co. 6595 Goodwood Ave., Baton Rouge 6.
- ALFRED MARION MELANCON, (1942), E. E., R., Tex. Gulf States Utilities Co., 645 East Drive, Beaumont, Texas.
- CHARLES L. MELANCON, JR., (J), M. E. Dow Chemical Co. 807 Magnolia, Lake Jackson, Texas.
- LOLAN J. MELANCON, (A), (1951), E. E., R. Southern Bell Tel. & Tel. Co. 132 Tudor St., Pineville, La.
- C. GLENNON MELVILLE, (1943), C. E., R. Private Consulting Practice. 7300 West End Blvd., New Orleans 24.
- HAROLD MELVILLE, JR., (J), (1950), Petroleum E., R. F. A. Callery Inc. Rt. 2, Box 198 GG, Lafayette.
- OSKAR R. MENTON, (1948), E. E., Esso Standard Oil Co. 350 East State Street. Baton Rouge.
- CHARLES A. MENVILLE, (1952), M. E., Esso Standard Oil Co. 1251 Longwood Drive, Baton Rouge 6.
- WALTER H. MERCIER, (1947), M. E., R., Esso Standard Oil Co. 2220 Terrace Ave., Baton Rouge.
- CLAIR V. MERRIAM, (1953), E. E., Gulf States Utilities Co. Box 2431, Baton Rouge 2.
- RICHARD F. MESSINA, (1945), C. E., Messina Engineering Sales Co. 10 Brockenbaugh Court, New Orleans 20.
- HENRY M. MESSINGER, (1950), Surveyor, R., Private Practice. 401 Jackson St., Eastrop, La.
- EDWARD R. METZ, JR., (1951), M. E., R., Cal-Metal Pipe Corp. of La. 6648 Sheffield Ave., Baton Rouge.
- RANDALL MEYER, (1950), M. E., Esso Standard Oil Co. 240 L.S.U. Avenue. Baton Rouge.
- RAYMOND J. MEYER, (J), (1947), M. E., R. La Power & Light Co. 936 Huey P. Long Ave., Gretna, La.
- ALBERT J. MEYERS, (1933), C. E., M. E., R. Shell Oil Co., Norco, La.
- GEORGE F. MEYN, (1951), C. E., U.S. Corps of Engrs., N. O. District. 4737 Venus St., New Orleans 22.
- FRANK J. MIANO, (J), (1952), M. E., J. H. Rutter-Rex Mfg. Co. 30 Livingston Ave. Chalmette, La.
- GEORGE E. MILLARD, (1945), M. E., E. E., R. Fairbanks Morse Co. 5528 Pitt St., New Orleans 15.
- GUY W. MILLER, (J), (1950), E. E., R. Gulf State Utilities Co. Rt. 2, Essen Lane, Box 67, Baton Rouge.
- HAROLD A. MILLER, (J), (1951), E. E., R. Consulting Engineer. 419 Jewel St., New Orleans 24.
- OTIS O. MILLER, (J), (1951), M. E., La. Public Service Commission. 5220 Wilmot St., Baton Rouge.
- OSWALD A. MINIERIS, (1953), M. E., R. Esso Standard Oil Co. 513 East Boyd Drive, Baton Rouge.
- ERNEST L. MIRE, (1938), C. E., R. New Orleans Public Belt Railroad. P. O. Box 1240, New Orleans 10.
- EDWARD C. MISHOU, (1949), M. E., Pet. E., R. La., Mich. Minnesota Pipe Line Co. 1054 W. First Nat'l Bank Bldg., St. Paul 1, Minn.

- CHARLES A. MITCHELL, (1949), M.E., R. La., Ohio, Ala. Cochrane Engineering Corp. 309 W. Jackson Blvd., Chicago.
- H. LANE MITCHELL, (1944), C.E., R. City of Shreveport. City Hall, Shreveport.
- H. C. MOFFITT, JR., (1948), C.E., R. U.S. Engineer Corps, Galveston District. 6055 Patton St., New Orleans 18.
- HENRI J. MOLAISSON, (1934), Ch.E., R., Tex., La. U.S. Southern Regional Laboratory, 5531 Marshal Foch St., New Orleans 24.
- RALPH R. MONGEAU, (J), (1952), E.E., U.S.A.F., 3034 Napoleon Ave., New Orleans 15.
- JOHN EDWARD MONROE, JR., (1944), Ch.E., R. Freeport Sulphur Co. P. O. Box 657, Port Sulphur, La.
- JOHN W. MONTGOMERY, (L.M.), (1923), Structural E., Jones & Laughlin Steel Co. (Retired). 4109 Tchoupitoulas St., New Orleans 15.
- JOSEPH T. MONTGOMERY, III, (1946), C.E., R. Consulting Engineer. 319 W. William David Parkway, New Orleans 20.
- DAVID MOODIE, (1933), M.E., R. N. O. Public Service Inc. 1600 So. Peters St., New Orleans 13.
- JOSEPH R. MOONEY, (1951), M.E., C.E., R., Gulf Refining Co. 5117 Louisa Drive, New Orleans 22.
- ANDREW M. MOORE, (1950), E.E., R. Central Louisiana Electric Co., Inc. Box 111, Alexandria, La.
- CHARLES B. MOORE (1955), Ch.E. Esso Standard Oil Co. 2208 Cherrydale St., Baton Rouge.
- MARION MOORE, (1954), Ch.E., R. State of Louisiana. 1302 Peniston St., New Orleans 15.
- JOHN E. MOREHISER, JR., (1938), M.E., R. Orleans Parish School Board, 148 Moss Lane, Harahan Branch, New Orleans 23.
- CYRIL K. MORESI, (1950), Petroleum Geologist. Busch and Moresi, P. O. Drawer 1302, Oil Center Sta., Lafayette.
- JAMES S. MORGAN, (1951), Ch.E., Barrow-Agee Laboratories Inc. 4355 Bayliss Ave., Memphis, Tenn.
- KEITH HAL MORGAN, (1950), E.E., R. Southern Bell Tel. & Tel. Co., Inc. 304 Richmond St., Bogalusa, La.
- LELAND E. MORGAN, (J), (1948), Agricultural E., R., Ben Pierson, Inc. 1405 W. 32nd St. Pine Bluff, Ark.
- R. DOUGLAS MORGAN, (1949), C.E., R. La., Tex. T. L. James & Co. Inc. 1000 Green Acres Road, New Orleans 20.
- THURMAN C MORGAN (1949), C.E., R. Dept. of Public Works, State of La. 508 So. Walnut, Tallulah, La.
- WALLIS J. MORGAN, (J), (1950), C.E., The Texas Co., 519 Sixth St., Gretna, La.
- RICHARD A. MORNHINVEG, (1937), M.E., R., Louisiana State University. 1042 Ingleside Drive, Baton Rouge.
- CARL T. MORRIS, (1949), Licensed Surveyor, La. Gulf Refining Co., Box 1731, Shreveport.
- DEWITT L. MORRIS, (1947), M.E., E.E., R., Freeport Sulphur Co. Venice, La.
- HAROLD I. MORRIS, (A), (1950), Freeport Sulphur Co., Box 697, Port Sulphur, La.
- HENRY M. MORRIS, JR., (1952), C.E., R., La., Texas. Southwestern La. Institute. P. O. Box 295, S.L.I. Station, Lafayette, La.
- WALTER B. MOSES, (L.M.), (1913), M.E., E.E., R., Ala., Miss., La., Tenn., Mo., Tex. Leo S. Weil & Walter B. Moses. 600 Audubon Bldg., New Orleans 16.
- MAGEE J. MOSS, (J), (1952), C.E., R. La. Dept. of Highways. Rt. 2, Box 270-A. Abbeville, La.
- F. PRESTON MOTTRAM, (1948), M.E., R. Red Star Yeast Products Co. P.O. Box 6218, New Orleans 14.
- ALFRED G. MÜLLER, (1950), M.E., Louisiana Power & Light Co. P. O. Box 963, Gulfport, Miss.
- JACOB F. MÜLLER, JR. (1932), M.E., Muller Furniture Mfg. Co. 3 Fairview Court, New Orleans 20.
- KARL C. P. MÜLLER, (1949), M.E., Louisiana Power & Light Co. 251 Halsey Drive, Rt. 2, New Orleans 21.
- RICHARD F. MÜLLER, (1939), M. and E.E., Allis Chalmers Manufacturing Co. 610 National Bank of Commerce, New Orleans 12.

- ADAM G. MUNDINGER, (1943), C. E., R. Mundinger, Dupree & Cooper. 4559 Highland Road, Baton Rouge.
- ROBERT S. MUNSELL, (1944), Mining E., Bechtel Corp. 6267 California Ave., Long Beach 5, Calif.
- STENNING C. MURPHY, (1944), Ch. E., R. Blue Plate Foods, Inc. 1717 Calhoun St., New Orleans 18.
- JOHN D. MURRY, JR., (J), (1950), C. E., R. F. C. McClanahan & Son. 151 Kayla St., Shreveport.
- WESTON W. MUSE, JR., (1945), C. E., R., Department of Highways. 2617 Madison Ave., Baton Rouge.
- HU B. MYERS, (1928), C. E., R., La. Dept. of Public Works. 2539 Olive St., Baton Rouge.
- LARUE D. MYERS, (1949), C. E., R., Texas, Miss., La., United Gas Pipe Line Co. P. O. Box 1407, Shreveport.
- M. GORRELL MYERS, (1953), E. E., R. Mass. Westinghouse Electric Corp. 235 Colony Place, New Orleans 23.

N

- EDWARD M. NABERSCHNIG, JR., (L.M.), (1923), Ch. E., R. Southern Cotton Oil Co., 365 River Road, Westwego, La.
- PATRICK J. NAIN, (J), (1949), C. E., C. W. Vollmer & Co., Inc. Box 374, Ferriday, La.
- CLAYTON L. NAIRNE, (1929), M. E., R., New Orleans Public Service Inc. 317 Baronne St., New Orleans 9.
- ROBERT L. NALL, (1936), M. E., R., John H. Carter Co. 318 Citrus Road, New Orleans 23.
- JOSEPH L. NANNEY (J), (1954), C. E., R. Va. Esso Standard Oil Co. 375 Riverlon Ave., Baton Rouge.
- ARTHUR J. NAQUIN, (1928), M. and E. E., R. New Orleans Public Service. Inc. 317 Baronne St., New Orleans 9.
- STEVE A. NASCA, (1947), C. E., E. E., R. La. Dept. of Highways. Baton Rouge, La.
- JAMES R. NEEF, (J), (1953), C. E. Address unknown.
- WALTER I. NEEL, (1950), C. E., R. Private practice. 1006 N. Second St., Monroe.
- CONRAD R. NEFF, JR., (1954), M. E. Esso Standard Oil Co. 1648 Kenmore Ave., Baton Rouge.
- LOUIS C. NEFF, JR., (J), (1951), C. E. Freeport Sulphur Co. 558 Sizeler St., New Orleans 21.
- ALLEN J. NEGROTTO, (L. M.), (1929), C. E., R. 129 Beverly Drive, New Orleans 20.
- BERNARD STANLEY NELSON, (H.M.), (L.M.), (1911), M. E., R. La., Tex., A. M. Lockett & Co., Ltd. (Retired), 7319 Panola St., New Orleans 18.
- LAWRENCE K. NELSON, (1940), M. and E. E., R. La., Miss. 7428 Benjamin St., New Orleans 18.
- WALDEMAR S. NELSON, (1936), M. E., E. E., R. La., Tex., Miss., Ark., Ala. Bedell & Nelson. 840 Union St., New Orleans 12.
- WYLY D. NELSON, (1947), Ch. E. 934 North Division St., Lake Charles, La.
- DARRELL L. NEPVEUX, (J), (1952), E. E. Address unknown.
- RICHARD B. NERF, (J), (1949), E. E., Esso Standard Oil Co. 2116 Carleton Drive, Baton Rouge, La.
- ROBERT E. NEUMANN, (1955), E. E., R. Self employed. 75 Thrasher St., New Orleans 24.
- CLIFTON R. NEWLIN, (1946), M. and E. E., N. O. Public Service Inc. 2216 Octavia St., New Orleans 15.
- HARRY P. NEWTON, (1939), Ch. E. U.S. Dept. of Agriculture, Camp Detrich, Frederick, Md.
- JAMES H. NICKELSON, (1944), Highways E., R., La. Dept. of Highways, Box 1106, Houma, La.
- LEO A. NIXON, (1942), C. E., The Texas & Pacific Ry., Co. Box 1526, Alexandria.
- PAUL S. NOBLE, (1954), M. E. Freeport Sulphur Co. 241 Anthony Ave., New Orleans 23.
- SIDNEY D. NOLAN, M. E., R., Cities Service Refining Corp. 215 Vine St., Maplewood, La.

- THOMAS H. NOLAN, (J), (1951), M.E., R. Marine Welding, Scaling & Sales Co., Inc., 2121 Chartres St., New Orleans 16.
 BENJAMIN F. NORMAN, (1954), M.E., R. La., Tex. Freeport Sulphur Co. P. O. Box 1520, New Orleans 5.
 JAMES B. NORMAN, (1954), C.E., R. Ark.-Louisiana Gas Corp. Room 405 Shreveport.
 JAMES R. NORMAN, (J), (1952), M. E. University of Texas. 5913 Penrose St., Dallas, Texas.

O

- CECIL K. OAKES, (1947), C. E., R. La. Dept. of Public Works. 4035 S. Barrow Drive, Baton Rouge.
 WILLIAM F. OAKES, (L. M.), (1918), General Contractor, O'Connor-Oakes Co., 259 Walnut St., New Orleans 18.
 JOSEPH T. O'BRIEN, (1940), E. E. Esso Standard Oil Co. 1557 Ingleside Drive, Baton Rouge 6.
 PAUL S. O'BRIEN, (1943), Metallurgical E. Socony Paint Products Co. 2140 Terrace Ave., Baton Rouge 6.
 LEO M. ODOM, (1942), C. E., R. P. O. Box 267, Baton Rouge.
 SEWALL J. OERTLING, (1948), Ch. E. Shell Oil Co. Inc., Norco, La.
 HORATIO NASH OGDEN, (1950), M. E., R., Ogden & Woodruff. 1645 Nicholson Drive, Baton Rouge.
 WILLIAM OGLESBY, JR., (J), (1953), M. E., Esso Standard Oil Co. 411 Riverlon Ave., Baton Rouge.
 JAMES P. OHLSEN, JR., (1954), E. E., R. U.S. Navy, District Public Works Office. 1836 Oleander St., New Orleans 20.
 CHARLES W. OKEY, (L. M.), (1911), C. E., Tennessee Valley Authority. 616 Union Bldg., Knoxville, Tenn.
 ROBBIE C. OLIVER, (1949), Surveyor, R. Caddo Parish Highway Dept. 4018 Thompson St., Shreveport.
 OLE K. OLSEN, (L. M.), (1907), C. E., R. Ole K. Olsen Co. 823 Perdido St., New Orleans 12.
 RICHARD R. O'NEALL, (1951), C. E., R., Ark., Tex., La. Arkansas Natural Gas Corp. P. O. Box 1087, Shreveport 9.
 JAMES A. O'NEILL, JR., (1954), Ch. E. Ingram Oil & Refining Co. P. O. Box RR, Chalmette, La.
 JOHN H. O'NEILL, (L. M.), (1916), C. E., R., La. State Board of Health. 637 Lowerline St., New Orleans 18.
 DONALD J. O'ROURKE, (J), (1951), Land Surveyor, C. E., R., Southwestern Louisiana Institute. Box 157, S.L.I., Lafayette.
 ADLOE ORR, JR., (1938) C. E., R., Adloe Orr, Jr. & Associates. 315 St. Charles, New Orleans 12.
 THOMAS P. ORR, JR., (A), (1925), Draftsman, Avondale Marine Ways Inc., P.O. Box 1030, New Orleans.
 ANTOINE J. ORY, JR., (J), (1954), M. E. N. O. Public Service Inc., 1600 South Peters St., New Orleans 13.
 FRANCIS J. ORY, (1941), C. E., R. Keller Const. Co. 313 Millaudon St., New Orleans 18.
 NEVILLE J. ORY, (J), (1952), C. E., R. The Texas Co. 1501 Canal St., New Orleans 16.
 RAYMOND A. OSBORN, (1950), C. E., R. La. Dept. of Highways, Box 232, Hammond, La.
 WILLIAM P. OSTER, (1928), M. and E. E., R., Equitable Equipment Co., Inc. 410 Camp St., New Orleans 12.
 WILLIAM P. OSTERHOLT, (J), (1954), C. E. 1232 Lowerline St., New Orleans 18.
 PAUL F. OSWALD, (1945), M. E. R., Thomson Machinery Co. 3031 Coliseum St., New Orleans 15.
 LOUIS R. OTTO, JR., (1950), E. E., R., N. O. Public Service Inc. 1600 Pine St., New Orleans 18.
 ROBERT C. OVERALL, (1954), C. E., R. Forcum James Co., Box 900, Baton Rouge.
 EUGENE H. OWEN, (J), M. E., R. Esso Standard Oil Co. 121 Clara Drive, Baton Rouge.
 RALPH OWEN, (J), (1949), Structural Draftsman, P. O. Box 1007, Shreveport, La.

- WILLIAM E. OWEN, (1946), E. E., R., Louisiana Polytechnic Institute, Ruston, La.
 WALTON R. OWENS, (1954), M. E., U.S. Rubber Co. P. O. Box 218, Port Allen, La.
 HENRY F. OWSLEY, JR., (1950), M. E., Owsley Insurance Agency, 311 California Co. Bldg., New Orleans 12.

P

- GEORGE C. PALMER, (1952), Petroleum E., R., Southwest Natural Production Co. P.O. Box 1487, Shreveport.
 PAUL P. PARETI, (1933), M. & E. E., Grinnel Co., Inc., 2402 Pine St., New Orleans 18.
 THURLOW W. PARISH, JR., (1946), Highway E., La. Dept. of Highways, 6389 Esplanade Ave., Baton Rouge.
 RHETT S. PARKER, (1950), C. E., E. M. Freeman & Associates, 4437 Clingman Drive, Shreveport.
 JULES G. PATOUT, (J), (1949), M. E., Red Fox Machine & Supply Co. 311 Duperier Ave., New Iberia, La.
 GEORGE S. PATRICK, (1954), Ch. E. Esso Standard Oil Co. 1725 Ormandy St., Baton Rouge.
 HAROLD J. PATTERSON, (1940), C. E., R., Andry & Feitel, August Perez & Associates, 1637 Robert S., New Orleans 15.
 FRED J. PAUL, (J), (1950), M. E., U.S. Rubber Co. 3506 Highland St., Beaumont, Texas.
 EDGAR H. PAVIA, (J), (1951), M. E., Bedell & Nelson, 840 Union St., New Orleans 12.
 GEORGE P. PEAGLER, (1954), C. E., R. Ebasco Services, Inc. P. O. Box 231, New Orleans.
 T. ELLIS PEAK, (1941), M. E., R. Esso Standard Oil Co. 2028 Lakeshore Drive, Baton Rouge 6.
 BRANDT PEDERSEN, (1946), M. E., Ch. E., R., Columbia Southern Chemical Corp. 651 Quilty St., Lake Charles.
 J. HOWELL PEEBLES, JR., (1949), M. E., R. Tulane University, P. O. Station 20, New Orleans 18.
 BOYKIN W. PEGUES, (L. M.), (H. M.), (1907), C. E., Professor of Civil Engineering Emeritus, La. State University, 4604 Perkins Road, Baton Rouge 15.
 JAMES L. PELTIER, (J), (1954), M. E. 309 Pelican Ave., New Orleans 14.
 GENARO F. PENA, (J), (1954), C. E. 7954 Vernon St., Chicago, Ill.
 RHEA D. PERCY, (1949), C. E., R. Self employed, 842 Geranium St., Baton Rouge 13.
 JOHN H. PERE, (J), (1950), E. E., United Gas Pipe Line Co. 3523 Elon St., Shreveport, La.
 HAYWOOD A. PERKINS, (J), (1951), Ch. E., Magnolia Petroleum Co., P. O. Box 2170, Beaumont, Tex.
 CLAIBORNE PERRILLIAT, (1944), C. E., R. Perrilliat-Rickey Construction Co. 1530 S. Rendon St., New Orleans.
 HOWARD PERRILLIAT, (1946), Perrilliat-Rickey Construction Co. 833 Esplanade Ave., New Orleans 16.
 FELICIEN PERRIN, (1946), M. E., R., Pan-Am Southern Corp. 1640 Palmer Ave., New Orleans 18.
 QUENTIN F. PERRITT, (1952), C. E. Private practice. P. O. Box 73, Arcadia, La.
 STAYTON L. PERRY, (1946), M. E., R. City of Alexandria, 2231 Olive St., Alexandria, La.
 RALPH M. PERSELL, (1949), Ch. E., R., Miss., La. Southern Regional Research Laboratory, 7216 Zimple St., New Orleans 18.
 JAMES BERNARD PETTEY, (1948), C. E., R. La. Dept. of Highways, 915 Louisiana St., Tallulah, La.
 CLAUDE A. PETTY, JR., (J), (1952), E. E., Esso Standard Oil Co. 127 Clara Drive, Baton Rouge.
 CHESTER A. PEYRONNIN, JR., (J), (1949), M. E., R., Tulane University, P.O. Station 20, New Orleans 18.
 JOSEPH R. PEZOLD, (J), (1951), C. E., R., Fromherz Engineers, 1900 Green Acres Road, New Orleans 23.

- JOHN L. PFEFFER, (J), (1955), C.E., R. N. O. Port of Embarkation. 1816 S. Lopez St., New Orleans 25.
- CHARLES J. PHILLIPS, JR., (1941), M.E., E.E., R., Percy & Phillips. 855 Audubon Ave., Baton Rouge.
- EDWARD W. PHILLIPS, SR., (1948), Union Sulphur & Oil Co., Sulphur, La.
- R. L. PHILLIPS, SR., (1949), M.E., R. La. Power & Light Co., Sterlington, La.
- RICHARD E. PHILLIPS, (J), (1952), M.E., R. Ethel Corp. Baton Rouge.
- SAM A. PHILLIPS, (J), (1950), C.E., R., Metal Goods Corp. 64 Neron Place, New Orleans 18.
- CLAUDE E. PICOU, (1949), C. E. The Flintkote Co. 8327 Palm St., New Orleans 18.
- BRISTER B. PIERCE, (1929), E.E., M.E., R., Gaylord Container Corp., Mill Division, Bogalusa, La.
- FREDERICK F. PILLET, (L.M.), (1922), C.E., R. 730 North 10th St. Baton Rouge 8.
- U. L. PITRE, JR., (J), (1952), C.E. Address unknown.
- HOMER E. PITTMAN, JR., (J), (1953), E.E., Esso Standard Oil Co. P. O. Box 2095, Baton Rouge.
- WALTER F. PLAUCHE, (1925), M.E., R. deLaureal & Moses. 5920 Perrier New Orleans 24.
- SIDNEY L. POLEYNARD, (1954), C.E., R. La. Dept. of Highways. 2549 Chaney Drive, Baton Rouge.
- E. FRED POLLARD, (1949), Ch. E., R., La., Miss. Southern Regional Research Laboratory. 1456 Calhoun St., New Orleans 18.
- JOSEPH POMINSKI, (1941), Ch. E., R. Southern Regional Research Laboratory. 950 Helois St., New Orleans 20.
- ROBERT L. PONS, (J), (1948), M.E. Consolidated Vultee Aircraft Co. 5233 Collinwood St., Fort Worth Texas.
- WILEY D. POOLE, (1947), Agricultural E., M.E., R., La. State University, Baton Rouge 3.
- ARTHUR CLINTON PORTER, (1940), M.E., General Dynamics Corp. 4620 Rutland Ave., Fort Worth 15, Texas.
- ARVA EARL PORTER, JR., (1945), C. E., R. Porter, Barry & Switzer, Box 1667 Baton Rouge.
- JOHN L. PORTER, (L. M.), (1909), C.E., R., Fromherz Engineers. 8407 Panola St., New Orleans 18.
- WANNER L. POTIN, (1954), E.E., R. Walter J. Barnes Electric Co. 4724 Ashbury Drive, New Orleans 21.
- JAMES R. POTTER, (J), (1952), C. E., R., Gulf Refining Corp., Houston Production Div. P.O. Drawer 37, Harvey, La.
- JOHN E. POTTHARST, (1937), M. E., Mechanical Equipment Co., Inc. 861 Carondelet St., New Orleans 12.
- JOHN E. POTTHARST, JR., (1943), M.E., E.E., R. Mech. Equipment Co. 861 Carondelet St., New Orleans 12.
- HENRY T. POULAN, (1949), M.E., E.E., R. Poulan's Electrical Co., 501 Morris Ave., Monroe.
- E. REID POWELL, (J), (1947), M.E., R., United Motors Service. 6434 Louisville St., New Orleans 24.
- FRANK J. PREHODA, (J), (1954), M.E. Esso Standard Oil Co. 5642 Capitol Heights Ave., Baton Rouge.
- JOHN A. PRESTON, (1954), Industrial E. Cal-Metal Pipe Corp. of La. P. O. Box 248, Baton Rouge.
- GEORGE A. PRICE, JR., (1948), E.E., R.F.D., Eustis, Fla.
- JEROME L. PRICE, (1952), M.E. Esso Standard Oil Co. 1945 Edinburgh Ave., Baton Rouge.
- KENNETH T. PRICE, (1944), Mining E., R. Freeport Sulphur Co., Port Sulphur, La.
- HAMPTON PRIMEAUX, (1949), C.E., R. Louisiana Dept. of Highways. P. O. Box 454, Franklin, La.
- LOUIS F. PRIMOS, (J), (1949), C. E., City of Shreveport Dept. of Water and Sewerage. 3542 Hardy St., Shreveport.
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- DeWITT L. PYBURN, (1941), C. E., R., Mississippi River Commission, U.S. Corps of Engineers, Box 267, Baton Rouge.

Q

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 J. H. QUINETTE, (A), (1946), Orleans Parish School Board, 2116 Dante St., New Orleans 18.
 PAT H. QUINLAN, (1925), C. E., R. Sewerage and Water Board, 1807 Pine St. New Orleans 18.

R

- HAROLD P. RABALAIS, (J), (1953), Agri. Engr., General Gas Corp. Box 2271, Baton Rouge.
 IRWIN A. RABEN, (1942), Ch. E., R. Cities Service Ref. Corp. 1910 Orchid St., Lake Charles.
 JAMES C. RACHAL, (J), (1948), E. E., R., U.S. Navy, Mine Countermeasures Station, 346 S. Palo Alto Ave., Panama City, Fla.
 WALTER S. RAINVILLE, JR., (1934), Transportation E., American Transit Assn. 98-10 70th Ave., Forest Hills 75, N. Y.
 EMETERIO I. RAMIREZ, (J), (1955), E. E., Electrical Construction Co., Inc., Box 44, Rio Piedras, Puerto Rico.
 LEONARD C. RAMON, JR., (1954), E. E., R. New Orleans Public Service Inc. 317 Baronne St., New Orleans 9.
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 WAYNE C. RANDALL, (1952), E. E., deLaureal & Moses, 5231 Capitol Hts. Ave., Baton Rouge.
 PAUL E. RANDOL, (1945), E., R. Central La. Electric Co., 2427 Jackson, Alexandria.
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 GEORGE W. RAPPLEYEA, (1946), C. E., R. Tenn. Tropical Agricultural Research Laboratory, P. O. Box 335, Southport, N. C.
 F. COOPER RATLIFF, (1951), Ch. E., R. Gaylord Container Corp. 409 Georgia Ave., Bogalusa, La.
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- DANIEL D. SANDEFUR, (1955), C. E., R. City of Alexandria, 1809 Bush Ave., Alexandria.
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- HARRY SCHAFER, (A), (1948), Marine E., R., Private Practice. 1038 Tchoupitoulas St., New Orleans 13.
- J. GILBERT SCHEIB, (1935), Construction E., Housing Authority of New Orleans. 2412 General Pershing St., New Orleans 15.
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- CARL SCHNEIDER, (1940), C. E., M. E., E. E., R., Consulting Engr. 7711 Plum St., New Orleans 18.
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- ROBERT MALLARD SEAGO, (1938), M. E., E. E., R., New Orleans Public Service Inc., 1600 So. Peters St., New Orleans 13.
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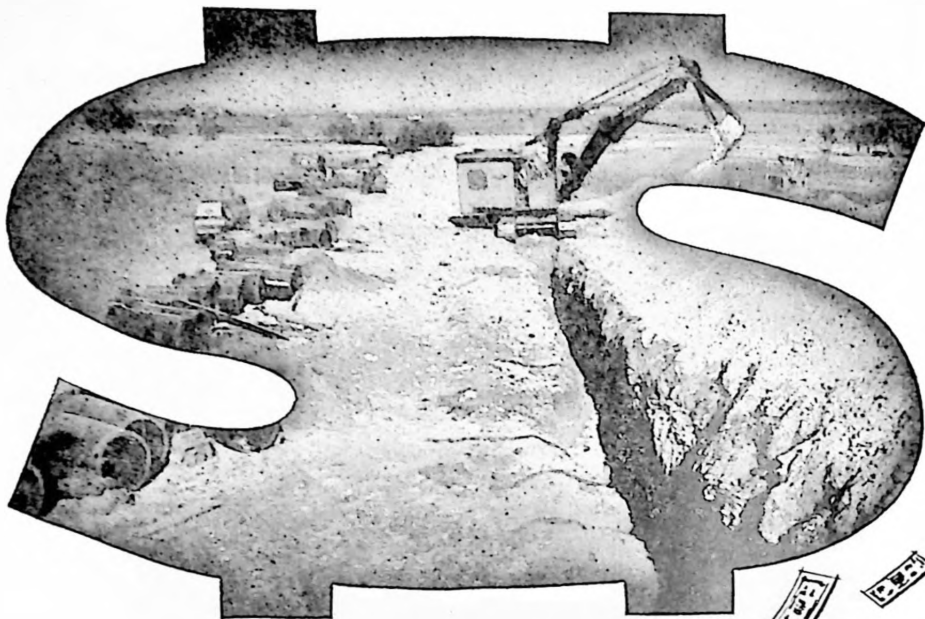
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- RAMON D. SPILMAN, (J), (1950), Inspection E., Cities Service Refining Corp., 123 Liberator St., Sulphur, La.
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- RAYMOND J. THIBODEAUX, (J), (1951), C. E., R., Gaylord Container Corp., 645 Avenue D, Bogalusa, La.
- ARTHUR C. THIGPEN, (1949), E. E., R., La. Polytechnic Institute, Tech Station, Ruston, La.
- JOSEPH J. THIGPEN, (1948), M. E., R., La. Polytechnic Institute, Box 255, Tech Sta. Ruston La.
- CARL H. THOMAS, (J), (1952), Agri. Engr. Agricultural Engineering Research, Louisiana State University, Baton Rouge 3.
- WILLIAM H. THOMAS, (1953), M. E., Esso Standard Oil Co. 347 Steele Blvd., Baton Rouge 6.
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- R. L. WILLIAMS, (1947), M. E., R., Freeport Sulphur Co., Port Sulphur, La.
- ROBERT MILTON WILLIAMS, (J), (1949), C. E., R. W. Horace Williams Co., 833 Howard Ave., New Orleans 12.
- ROBERT O. WILLIAMS, (1951), E. E., Southern Bell Tel. & Tel. Co. 315 Dalzell St., Shreveport.
- ROBERT W. WILLIAMS, (1940), Ch. E., Esso Standard Oil Co. Rt. 3, Perkins Road, Baton Rouge 7.
- W. HORACE WILLIAMS, (L.M.), (1908), C. E., R., W. Horace Williams Co., Galabank-on-Jourdan, Star Rt., Bay St. Louis, Miss.
- W. HORACE WILLIAMS, JR., (1943), C. E., W. Horace Williams Co. 833 Howard Ave., New Orleans 13.
- CHARLES S. WILLIAMSON, JR., (L.M.), (1916), Ch. E., R. Consulting Engineer, 1739 Marengo St., New Orleans 15.

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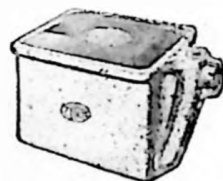
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- ROBERT B. WILLIAMSON, (1951), E. E., R., Williamson Sales Co., Box 1223, Shreveport.
- JAMES NORMAN WILSON, SR., (L.M.), (1911), M.E., Sewerage & Water Board of New Orleans. 2425 Audubon St., New Orleans 18.
- TROY L. WILSON, JR., C. E., R. Esso Standard Oil Co. 9163 S. River Oaks Drive, Baton Rouge 6.
- W. W. WILSON, (1949), C. E., United Gas Pipe Line Co., P. O. Box 1407, Shreveport, La.
- A. R. WINGATE, JR., (L.M.), (1925), C. E., Jones & Laughlin Steel Corp., P. B. Box 66, New Orleans 6.
- JOHN D. WINK, JR. (J), (1954), M. E., La. Columbian Carbon Co., Monroe, La.
- DANIEL L. WINTERS, (A), (1953), Ch. E., Central Louisiana Electric Co., Inc., New Iberia, La.
- WILLIAM A. WINTZ, JR., (1942), C. E., R. La. State University, College of Engineering, Baton Rouge 3.
- BURRIS D. WOOD, (1947), C. E., R., La. Dept. of Public Works. 2435 Cottonwood Ave., Baton Rouge.
- CARROLL L. WOOD, JR., (1946), C. E., R., Perrilliat-Rickey Construction Co. 552 Walnut St., New Orleans 18.
- JOHN WRIGHT WOOD, (1948), M. E., Cities Service Refining Corp. 102 Madison, Maplewood, La.
- CHARLES S. WOODRUFF, (1950), M. E., E. E., R., Ogden & Woodruff, Consulting Engineers, 1645 Nicholson Drive New Orleans 18.
- JAMES W. WOODRUFF, M. E. Address unknown.
- A. ALFRED WOODS, (L. M.), (1941), C. E., R., La., Ind., Ky. Retired, Southern Railway System. 1923 State St., New Orleans 18.
- DURAND F. WOODS, (L. M.), (1922), C. E., R., Lutchter, La.
- KENNETH H. WOODWARD, (1954), The Texas Pipe Line Co., 514 W. St. Louis St., Lafayette.
- THOMAS A. WOODWARD, (1952), E. E., R. Central La. Electric Co., Mansfield, La.
- JOHN KING WOOLF, (1943), C. E., R., Ala., Tex., W. Horace Williams Co. 833 Howard Ave., New Orleans 12.
- GORDON B. WOOSTER, (1948), C. E., M. E., R., Cities Service Ref. Co., Lake Charles, La.
- JAMES W. WYCHE, (1953), M. E. U.S. Pumps, Inc. P. O. Box 507, New Iberia, La.
- CHARLES J. WYLER, (L.M.), (1919), M. E., R., A. M. Lockett & Co., Ltd. 2235 Magazine St., New Orleans 13.

Y

- WADE H. YAWN, JR., (1947), C. E., R., La. Dept. of Highways. Box 446, DeRidder, La.
- JOSEPH A. YAZBECK, (J), (1949), Industrial E., Cunningham Machinery Corp. 931 Robinhood St., Shreveport.
- ALBERTA M. YOUNG, (1951), Petroleum E., R. Private Practice. 904 Nat'l. Bank of Commerce Bldg., New Orleans 11.
- LOVETT YOUNG, (1943), Chemist. Gulf States Utilities Co. 9192 Wynnewood St., Baton Rouge.
- MARION E. YOUNGS, (J), (1953), M. E., Byron Jackson Co. 518 International Trade Mart, New Orleans 12.
- GEORGE L. YOUSKO, JR., (1949), M. E., Esso Standard Oil Co. 4746 Palm St., Baton Rouge, La.

Z

- MARIO G. ZERVIGON, (1943), E. E., R., L. N. Goodman & Associates. 732 Third St., New Orleans 21.
- ROBERT W. ZIFLE, (1937), New Orleans Public Service Inc., 317 Baronne St., New Orleans 9.
- T. H. ZUMWALT, (1944), C. E., R., La., Tex. Freeport Sulphur Co. 161 Beverly Drive, New Orleans 20.
- FREDERICK W. ZURBURG, (1952), Ch. E., R., Southwestern Louisiana Institute, Box 124, S.L.I., Lafayette, La.

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PROCEEDINGS

OF THE

LOUISIANA ENGINEERING SOCIETY

Vol. 41

SEPTEMBER, 1955

No. 3

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ANNUAL OUTING

The annual outing for 1955 was held at the Colonial Golf and Country Club at New Orleans on July 14, 1955. The afternoon was clear and record numbers of members took part in the activities—golfing, horseshoe pitching and encouragement-shouting from the sidelines. A record was set when 39 members and guests participated in the horseshoe tournament and the golf turnout of 94 was excellent as well.

Later the members broke another record when 266 were present for the banquet and award ceremonies.

The committee is happy to present the winners, prizes and donors of the prizes as follows:

GOLF PRIZES

Presidents Flight—Frank Macdonald, Silver Compote, Mallard Seago.

Members Gross Prizes—1st. A. J. Bartlett, Silver Dish, Equitable Equipment Co.; 2nd. Robert Drueding, Mixette, John H. Carter Co.; 3rd. Walter Fush, Knives, Chase Brass & Copper.

Guests Gross Prizes—1st. Buddy Taulman, Silver Banana Dish, Farnsworth & Chambers Co.; 2nd. Geo. Nusloch, Toaster, Geo. S. Dinwiddie.

Members Net—1st. H. A. Liles, Links (& Trophy), Avondale Marine Ways; 2nd. C. K. Dunbar, Deep Fryer, J. Ray McDermott Co.; 3rd. Roy Cappel, Knives, Pittsburgh Testing Lab.; 4th. Dutch Kammer, Travel Iron, N. O. Cement Prod.; 5th. J. E. Wallace, Toast Dish, Ole K. Olsen;; 6th. F. Fuller, Juicer, Allan Harris Co.; 7th. J. R. Gore, Golf Balls, King & Co.; 8th. W. J. Drawe, Golf Balls, Pan-Am Southern; 9th. Ed. Richardson, Golf Balls, R. E. Gosa.

Guests Net—W. M. Prall, Links, Avondale Marine Ways; 2nd. Henry Coates, Golf Balls, Jahncke Service; 3rd. Jack Mayn, Golf Balls, Lone Star Cement.

Closest to Hole 5—Henry Angella, Spin Reel, W. D. Taulman;

Closest to Hole 16—W. H. Fush, Silver Veg. Dish. Ayers Materials.

Members High Gross—Tied—J. W. Roach, Dazey Ice Crusher, United Gas Pipe Line; Fred Baehr, Dazey Ice Crusher, Allis Chalmers.

HORSESHOE PITCHING PRIZES

Singles—W. F. Horrell, Jr., Cocktail Set, Eugene Dietzgen Co.

Singles Runner Up—Claude Kelly Jr., Electric Shaver, Eustis Engineers.

Doubles—Ory, Knives, A. M. Lockett Co.; Vogt, Knives, Standard Supply & Hardware.

Doubles Runner Up—Ray Bailey, Knives, Orleans Material; Steve Nasca, Knives, Anaconda Wire & Copper.

Participation Prizes—E. J. Dantin, G.E. Frypan, American Creosote Co.; Claude Kelly, Jr., T.V. Tables, Dixie Machine Welding; John Bull, Reel, Freeport Sulphur Co.; H. W. Strewburg, Reel, Shilstone Testing Lab.

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Boh Bros. Const. Co.	Outing Kit	Robert Gilliot
E. G. Boh Forest Prod.	No. 257 Rod	E. L. Gish
Byron Jackson	Outing Kit	R. E. Gosa
C. G. Cappel	Kooler Keg	B. D. Triche
Eagle Asbestos and Packing	Juicer	E. R. Cousins
R. P. Farnsworth Co.	Bar B-Q	C. J. Mayeux
Fletcher Equipment	Wheelbarrow	P. C. Boudreaux
Flintkote Co.	Stainless Steel Jug	Jack Groh
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Gulf Engineers	Silver Tray	J. E. Wallace
Jones & Laughlin	No. 1924s Reel	Mike Abraham
J. Ray McDermott	Blender	E. L. Fithian
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EDITORIAL

The Conclusion of the Curtis McDaniel Case. The most significant recent happening of common interest to engineers in this section was the final decision in the Curtis McDaniel case as a test of the Engineering Registration Law. The letter from the Board to all members is quoted in part:

"On May 8, 1955, the Board of Registration for Professional Engineers and Land Surveyors circularized the Professional Engineers and Engineering Societies of the State of Louisiana, presenting the facts of the Curtis McDaniel Case. Mr. McDaniel is a general contractor of the City of Crowley, La., and was reported to have prepared plans and working drawings for the construction of rice dryers, rice storage plants, and other similar large structures. The Board considered that Mr. McDaniel in performing services involving the planning and design of structures without being registered as a Professional Engineer, was in violation of the Engineering Registration Law and should be enjoined from such practice.

"It was felt that the prestige of our engineering profession and the Engineering Registration Law was at stake in this case and that every effort possible should be exerted to prevent this violation and bring the case to a successful conclusion.

"The Board, after considering the case thoroughly, agreed unanimously that it should proceed with a civil case against Mr. McDaniel and institute an injunction proceeding. Accordingly, the Attorneys representing the Board filed a petition for injunction in the 15th Judicial District Court for the Parish of Acadia. Mr. McDaniel's Attorneys, after conferences, agreed that he was in violation of the Statute and consented that a judgment should be entered enjoining him. The case was considered by the Court on June 23, 1955, and the judgment was rendered in the favor of the Board. Mr. McDaniel has been enjoined from practicing or offering to practice Professional Engineering in any of its departments in the State of Louisiana, and more specifically from planning, designing and supervising the construction of structures. The Board has agreed that in cases of doubt Mr. McDaniel may present facts to the Board which will give him its opinion as to whether the proposed course of action is in violation of our Statute.

"The Board is endeavoring to administer the provisions of the Engineering Act in a just and proper manner, and it feels that in the case just considered a satisfactory conclusion has been obtained.

As this case received prominent attention in some sections of the State, the above facts are presented to you for consideration."

The Engineering Registration Law was the first major step in elevating the status of the Professional Engineer in Louisiana. This case was important not in that a given violation was stopped but in that the system of surveillance, action by the Board and court action were proven to work efficiently. The case should serve as a deterrent to other violations and as a model for action by this and succeeding Boards.

New Members. The following have been elected to membership in our Society.

For Member

- B. A. AXELRAD, Port Sulphur; age 46. Endorsed: F. B. Blackstone, R. H. Earl, W. S. Nelson, Rice Institute, B.S.Ch.E. 1930; Member AIChE, AIMME, Am. Chem. Society. Registered Ch.E., Mining E., Texas. Freeport Sulphur Co., 1930 to date. All phases of chemical engineering work associated with sulphur mining. President position, Asst. Vice-Pres.
- DANIEL E. BIVINS, JR., Monroe; age 56. Endorsed: H. E. Dickard, D. X. Ellett, J. R. McKinley, Alabama Polytechnic Institute, B.S.E.E. 1921. Associate Mbr. AIEE. General Electric Co., Atlanta, Field Engr., 1922-32. Brown Paper Mill, Monroe, Electrical Engr., maintenance supervision, 1932-55.
- BERTELL W. BOXX, Lafayette; age 31. Endorsed: T. A. Bonnet, J. E. Reed, Jr. W. D. Walthall. La. State University, B.S.E.E. 1950. Southern Bell Tel. & Tel. Co, Jr Engr., Feb. 1950 to date
- JOHN F. BREWER, Baton Rouge; age 42. Endorsed: W. G. Stewart, H. L. Landry, T. E. Alexander. La. State University, B.S.Ch.E., 1939. Member Am. Chemical Society. Standard Oil Co. of N.J., Research and Development Engr., 1936-46. Baton Rouge Brick & Tile Co., President and Gen. Mgr., 1946-48. Copolymer Corp., Drafting, Pilot Plant Operation, Process Engineering, 1948-date.
- CARL D. BROOKS, Sterlington; age 51. Endorsed: A. G. Muller, R. L. Phillips, C. L. Denson, M. M. Funderburk. Member ASME. Louisiana Power & Light Co., Oct. 1929 to date, present position, Station Chief in charge of operation, Sterlington Steam-Electric station.
- HERBERT E. BUTLER, Baton Rouge; age 34. Endorsed: H. T. Barr, W. H. Carter, W. D. Poole. La. Polytechnic Institute, B.S.Ag.Eng. 1953. Associate Member ASAE. Various sub-professional engineering jobs in Arkansas, 1939-43. U.S. Dept. Agriculture, Soil, Conservation Service, Agricultural Engineer, 1943-55, various duties including training of personnel. La. State University, Research Associate, Irrigation Research, March 1955-date.
- JAMES L. CAMPBELL, New Orleans; age 49. Endorsed: W. J. Drawe, Jr., G. E. May, R. M. Seago. North Carolina State College, B.S.E.E. 1927. Associate Member IES. N.O. Public Service Inc., Lighting Sales Engr., 1931-32; Power and Gas Sales Engr., 1932-34; Industrial Sales Engr., 1934-39; Mgr. Commercial Division, 1939-date.
- JOSEPH J. CEFALU, Morgan City; age 46. Endorsed: F. W. Macdonald, J. H. O'Neill, A. B. Ritter. La. State University, B.S.E.E., 1933; B.S.M.E., 1935. Registered E.E., M.E., La. City of Morgan City, La., 1935 to date, Supt. Municipal Water Plant. Responsible for plans, specifications and supervision of new power plant with 3500 h.p. unit; redesign entire distribution system. Designed new transmission system with substations and secondary feeders.
- DONALD E. COUGHLIN, Baton Rouge; age 39. Endorsed: D. H. Hovey, W. M. Robbins, W. L. Sutton. University of California, B.S.E.E. 1939. Associate Member AIEE. Registered E.E., Calif., Ohio. Permanente Cement Co., California, Jr. Engr., 1939-41. Permanente Metals Co., Electrical Supt. of Construction, 1941-47; Senior Engineer, 1947-49. Kaiser Aluminum Corp., Newark, O., Electrical Supt., 1949-53; Baton Rouge, Electrical Supt., 1943-date.

- PAUL R. COURREGE**, Baton Rouge; age 27. Endorsed: T. E. Alexander, L. J. Lassalle, W. G. Stewart. La. State University, B.S.M.E. 1950. United Gas Pipe Line Co., N. O. Asst. Engr., pipeline construction and survey, estimating, 1950-52. Copolymer Corp., Baton Rouge, Feb. 1952-date, Mechanical Engineer, misc. design and estimating.
- BENJAMIN S. DALTON**, Baton Rouge; age 40. Endorsed: T. J. Innes, Jr., H. L. Landry, R. Meyer. North Carolina State College, B.S.M.E. 1935. Member AIME. Registered M.E., N.J. Allis Chalmers Mfg. Corp., Milwaukee, Senior Engineer, 1942-43. Jones & Laughlin Ore Co., N.Y., Plant & Asst. Supt. of Plant, 1943-45. American Cyanamid Co., Calco Chemical Div., Va., Senior Project Engr., 1945-48. Dorr Company, Stamford, Conn., Chief Engr., 1948-53. Kaiser Aluminum & Chemical Corp., Baton Rouge, Supt. of Engineering, Oct. 1953 to date.
- ROBERT R. DENNIS, JR.**, Baton Rouge; age 29. Endorsed: T. E. Alexander, W. L. Sutton, W. G. Stewart, Jr., La. Polytechnic Institute, B.S.Ch.E. Aug. 1949. Columbian Gasoline Corp., Monroe, Chemical Engr., Carbon Plant Operational Problems, Heat & Mtl. Balance, Gas Analysis, Dec. 1949-Jan. 1952. Copolymer Corp., Baton Rouge, Chemical Engr., Plant Process Engr., Mechanical Engr., Rubber Production Supervisor, Jan. 1952-date.
- VINCENT A. FORTE**, Plaquemine; age 27. Endorsed: J. S. Duhe, W. C. Randall, W. M. Robbins. La. State University, B.S.E.E. Jan. 1949. Registered E.E., La. Stone & Webster Eng. Corp., Electrical Draftsman, 1948-49. Friede & Goldman, Naval Architects, Electrical Drafting, Naval Lt. & Power System Design, 1952. J. F. Pritchard Construction Co., Electrical Engr., 1953. Kaiser Aluminum & Chemical Corp., Baton Rouge, Electrical Designer, Draftsman, Nov. 1953-date. Also engaged in Consulting Electrical Eng. practice, Feb. 1954 to date.
- M. J. GUILLORY**, Baton Rouge; age 37. Endorsed: T. E. Alexander, H. L. Landry, B. L. Louviere. La. State University, B.S.Ch.E. 1940. Consolidated Chemical Industries, Plant Engineer, 1941; Supt. Sulphur Plant, 1950; Plant Superintendent, 1954.
- JOHN J. GUTH, JR.**, Shreveport; age 26. Endorsed: O. J. Dykes, Jr., C. M. Hadra, R. S. Segall. University of Tennessee, B.S.E.E. 1950. Associate Member AIEE. Registered E.E., La. Townsend Electric Co., June-Dec. 1950. U.S.A.F., Research and development and Armament Officer, 1951-52. Hadra & Malahy, Mechanical & Electrical designing, 1953-54. Carl Hadra Associates, Mechanical engineering duties, Oct. 1954 to date.
- GEORGE C. HENGY**, Shreveport; age 56. Endorsed: E. M. Freeman, F. W. Grant, C. M. Hadra. University of Texas, B.S.E.E. 1924. Member AIEE, Nat'l Society Professional Engrs., Texas Society P.E. Registered E.E., Ark., La., Okla., Tex. U.S. Army Signal Corps, Master Signal Electrician.
- HOMER H. MULLINS**, Monroe; age 46. Endorsed: A. P. Andrews, O. H. Atkins, J. E. Ross. La. State University, Civil Engineering, 1923-24. University of Ala., Civil Engineering, 1924-25, 1928-29. Registered C. E., La. No. 798. The Brown Paper Mill Co., Inc., various duties in design, construction and operation, 1940-42. U.S. Navy Construction Bn, Lt. j.g. 1942-45. Brown Paper Mill Co., Inc., Asst. Plant Engineer, layout, design, supervision, 1945-date.
- HOWARD D. MUSE**, Baton Rouge; age 46. Endorsed: L. R. Kirst, L. M. Odom, W. M. Robbins, W. J. Spano. Bryson College, Fayetteville, Tenn., Liberal Arts, 1927-29. University of Tenn., B.S.C.E. June 1933. Member SAME. Registered C.E., La. State of Tenn. Dept. of Agriculture, Erosion Control Foreman, Project Supt., 1933-40. State of La. Dept. of Highways, Road Inventory Analyst, 1940-41. La. State University, Instructor in C.E., 1941-42. La. Dept. of Public Works, Design Engineer, 1942. U.S. Navy, CEC, company commander, foreign theatres, 1942-45. La. Dept. of Public Works, Design Engineer, 1946. Self-employed, non-engineering, 1946-48. A. G. Mundinger & Mundinger, Dupree & Cooper, Baton Rouge, Party Chief, 1948-51. J. G. White Engineering Corp., Field Engineer, expansion of Solvay Process B.R. plant, 1951-53. Kaiser Aluminum and Chemical Corp., Special Design Draftsman, Office Engineer, No. 1953 to date.
- H. R. NORCKAUER**, Baton Rouge; age 33. Endorsed: H. L. Lehmann, L. Duclos, S. A. Nasca. La. State University, B.S.C.E. 1942. Junior Member ASCE, N.Y., 1942-50. Member American Rocket Society, 1949-date. Registered C.E., La. La. Dept. of Highways, Jr. Traffic Engr., 1953 to date. Kaiser Metal Products, Aircraft Div., Chief Purchasing Agent, Bristol, Va., 1952-53. Lundy Mfg. Corp., N.Y., Production Mgr., 1951-52. Curtis Wright Corp., Rocket Div., Production Mgr., 1948-51. Chase Aircraft Co., Inc., W. Trenton, N.J., Purchasing Agent, 1946-48. Eng. Division, A.M.C., Wright Field, Ohio, Research and Development Engr., 1942-46.

- CARL A. OESER**, Lafayette; age 36. Endorsed: H. B. Myers, C. J. Russell, T. B. Smart. Illinois Institute of Technology, Chicago, 1936-42. Attended school while working full time. Completed 3 yrs. work on M.E. degree. Member American Congress on Surveying and Mapping. Registered C.E., La. No. 2278. Chicago Metal Hose Corp., Drafting, design of production tools, plant layout and supervision, 1937-42. La. State Dept. of Public Works, Area Engineer in charge of all engineering projects in western half of S. W. District, 1945 to date.
- WALTER R. OVERTON**, Monroe; age 43. Endorsed: J. F. Mallette, H. T. Poulan, J. E. Ross. Member La. Highway Engrs. Ass'n. Registered C.E., La. (Public Employee). La. Dept. of Highways, Rodman, Jr. Instrumentman, 1930-41. U.S. Army, 1941-45. La. Dept. of Highways, Instrumentman, Chief of Party, Jr. Project Engineer, Project Engineer, Dec. 1946 to date.
- THEODORE L. PANTZ**, Lafayette; age 45. Endorsed: W. H. Hall, H. R. Mason, F. W. zurBurg. Columbia University, B.A. 1930; B.S.M.E., 1931; E.E., 1932. Associate Member AIEE. Registered M.E., Ohio. P. Sorensen Mfg. Co., N.Y., Chief Engr. 1935-37. Western Electric Co., N.J. and Md., Development Engineer, 1937-40. General Motors, Frigidaire Div., Mgr. of Mfg., Morain City Plant, 1940-47. Seeger Refrigeration Co., Evansville, Ind., Works Mgr. in charge of factory operations, 1947-53. Servel, Inc., Evansville, Vice-President of Mfg., 1953-54. Southwestern La. Institute, Associate Professor of Electrical Engineering, 1954-date.
- GEORGE H. POPE**, Baton Rouge; age 37. Endorsed: T. J. Innes, Jr., H. L. Landry, R. Meyer. Tulane University, Mechanical Engr., June 1936 to March 1938. Rutgers University, Mech. Eng., April 1943 to Feb. 1944. Carrier Corp., Chicago, Design Draftsman, Apr.-Sept. 1938. La. Geodetic Survey, Topographic Draftsman, 1938-39. U.S. Soil Conservation Service, Area Draftsman, Alexandria, La., 1940-41. The Austin Co., Ft. Worth, Mechanical Engr., 1941-42. U.S. Army Air Force, 1942-44. Gasoline Plant Construction Corp., Houston, Design Supervisor, 1944-47. Foster Wheeler Corp., N.Y., Resident Engr. in charge design and const. petroleum refinery expansion for Standard Oil, 1947-49. Creole Petroleum Corp., Caracas, Venezuela, District Engineer, 1949-54. Kaiser Aluminum & Chemical Corp., Baton Rouge, Plant Engineer, Head Plant Eng. Dept., Aug. 1954 to date.
- BENJAMIN F. PRESTON**, Baton Rouge; age 30. Endorsed: T. E. Alexander, B. Louviere, W. Mercier. Georgia School of Technology, M. E. course, 1946-48. Latex Construction Co. of Ga., Construction Engineer, general industrial construction, refinery installations, 1948-54. La.-Miss. Pipeline Construction Corp., Division Engr., layout, design, supervisor, 1954-55. Military Service, 1943-5, submarine service, motor maintenance Diesel School, Chicago; Diesel and submarine school, New London, Conn.
- WILLIAM J. ROUNTREE**, Alexandria; age 43. Endorsed: Oren Baker, C. C. Edwards, T. F. Colbert. International Correspondence Schools, Highway Engineering, 1937-39. La. Hwy. Engineers Ass'n., Engineer III. Registered C.E. (Public Employee) La. No. 1256. La. Highway Commission, Rodman, Plant Inspector on concrete paving projects, Jr. Instrumentman, 1931-38. La. Dept. of Highways, Instrumentman, Project Engr., Resident Engr., 1938-date.
- LOUIS C. SCHILLING**, Baton Rouge; age 31. Endorsed: T. E. Alexander, W. G. Stewart, W. L. Sutton. La. State University, 1941-43; 1947-49; B.S.M.E. June 1949. Associate Member ASME, 1949. Boyce Hanney Machine Co., Salesman, Caterpillar products, 1949-50. Higgins, Inc., Draftsman and design, 1950. Solvay Process Co., Carpenter and Painters Foreman, plan and supervise work, 1950-51. Copolymer Corp., Mechanical Engineer, design of foundations, pressure vessels, process piping, pump and compressor installations, inspection, March 1951-date.
- DELROY O. SPANN**, Baton Rouge; age 33. Endorsed: T. E. Alexander, J. L. Smilie, F. B. Stirling. La. State University, B.S.Ch.E., 1942. Esso Standard Oil Co., Maintenance Inspection of Chemical Products Div.; Chemical Technical Service Dept., process eng. work, 1942-49. H. E. Wiese Construction Co., Construction Engr. on renovation of Butadiene Plant for Copolymer Corp., 1950-51. Delta Tank Ffg. Co., Gamma Industries Div., 1 yr.; Eng. Dept., Oil and Gas Field Equipment Section, design work, Oct. 1943-date.
- WILLIAM L. STEVENS**, Baton Rouge; age 26. Endorsed: T. J. Innes, Jr., P. Wamsley, R. W. Williams. Va. Polytechnic Institute, B.S.E.E. 1951. Student Member Tau Beta Pi, Eta Kappa Nu, AIEE, SAME, 1950-51. June 1951 to date, Esso Standard Oil Co., Baton Rouge, Engineer, Technical studies and examinations. Nov. 1951-Nov. 1953, U.S. Army, Lt. Signal Corps, technical functions, concurrent with Esso employment.

MALCOLM W. STUMPF, New Orleans; age 53. Endorsed: M. C. Abrahm, W. J. Drawe, Jr., R. M. Seago. La. State University, B.S.E.E. 1925. Member AIEE. Registered E.E., La. N. O. Railway & Light Co, electric distribution, inventory of property, 1925-26. Phoenix Utility Construction Co., Havana, 1926-28; design of underground network system. Compania Cubana de Electricidad, Havana, Assistant to Chief Engineer, 1928-40. New Orleans Public Service Inc., 1940-date, Principal Electrical Engineer, head of electrical engineering division.

BENNY J. SWINDLER, Baton Rouge; age 29. Endorsed: W. L. Sutton, T. E. Alexander, W. G. Stewart, Jr. La. State University, B.S.M.E. Feb. 1950. Associate Member ASME. La. Dept. of Highways, Surveying, March-Sept. 1950. Copolymer Corp., Mechanical Engr., maintenance engineering, Sept. 1950-date.

1917-19. Texas Power & Light Co., Dallas, Chief Design Engr., 1924-38. Partnership with W. E. Callahan and A. G. Ainsworth, REA distribution and transmission line construction, 1938-39. Brown & Root, Inc., General Supt. Perdarnales Elec. Cooperative, construction, 1939-40. Brown-Bellow-Columbia, General Supt., Elect. Design and construction. Naval Air Center, Corpus Christi, Power plants, all distribution, telephone, lighting, etc. 1940-44. Geo. C. Hengy & Co., all types of consulting engineering, 1944 to date.

E. ROGER JONES, JR., Baton Rouge; age 34. Endorsed: L. Duclos, A. R. Kuzel, G. F. Matthes. La. State University, B.S.M.E. 1943; M.S.M.E. 1951. Member ASEE. Registered M.E., La. South Coast Corp., Asst. Engineer, Chief Chemist, sugar house, 1945-48. La. State University, Instructor in M.E., 1948-51. U.S. Air Force, University of Puerto Rico, Asst. Professor of Air Science Tactics, 1951-53. La. Dept. of Highways, Bridge Design Section, Asst. Mech. Engr., Mar.-Sept. 1953. La. State University, Instructor, Asst. Professor M.E., Sept. 1953 to date.

MARVIN R. KIMBRELL, JR., New Orleans; age 38. Endorsed: I. C. Weidig, R. D. Allen, W. S. Leake. Clemson College, B.E.E. June 1941. Associate Member AIEE, Engrs. Club of Baltimore. Duke Power Co., Charlotte, N. C., Technician, Meter Laboratory, 1937-38; Asst. to Engr. in charge construction, waterworks purification plant expansion, 1939-40. Westinghouse Electric Co., Student Sales Training Course, 1941-42. U.S. Navy, Reserve Officer assigned to Bureau of Ships, 1942-45. General Electric Co., Apparatus Dept., 1946-49; Transformer Specialist, 1949-53; Sales Engineer, New Orleans, Dec. 1953 to date.

JOE E. LEAVINES, Baton Rouge; age 32. Endorsed: J. S. Duhe, T. H. Kalencki, W. C. Randall, W. M. Robbins. Rice Institute, B.S.E.E. June 1950. Member AIEE, IAEE. Registered E.E., La. E. I. duPont de Nemours, Houston, Project Engr., 1950-54. Kaiser Aluminum & Chemical Corp., Electrical Engr., 1954-date.

CHARLES J. LEDOUX, New Orleans; age 46. Endorsed: W. D. Holloway, M. F. Knost, J. R. Mooney. Loyola University (night) 1936-42, B.S. Economics, 1942. Delgado Trades School, Mechanical Drafting course completed. I.C.S. correspondence course in Petroleum Refining Eng. completed. Registered M. E., La., Tenn. Shell Oil Co., Norco, Laboratory Tester, 1928-31. Gulf Refining Co., Lab Tester, Mechanical Draftsman, Engineering Draftsman, Estimator, 1933-42. U.S. Army Corps of Engrs., petroleum pipeline operation, European theatre, 1943-46. Gulf Refining Co., Engineer & Estimator, 1946-47; Asst. Supervisor, 1947-49; Supervisor, 1949 to date, responsible for all engineering including field supervision for terminals and bulk station design and construction.

WALTER LEMANN, JR., Baton Rouge; age 46. Endorsed: O. J. Hebert, D. H. Hovey, T. J. Innes, Jr., Tulane University, B.S. 1929. Mass. Institute of Technology, M.S.Ch.E. 1930. Member American Chemical Society. Registered Ch.E., La. Texas Co., Port Arthur, Research Chemist, pilot plant operation and process control, 1930-34. Freeport Sulphur Co., Chemical Engineer, 1934-35. Solvay Process Div., Allied Chemical & Dye Corp., Chemical Engineer, 1935-44. Nicaro Nickel Co., Asst. Metallurgical Plant Supt., 1944-46. Solvay Process Co., Chemical Engr., Asst. Project Mgr., Acting Project Mgr., 1946-54. Consultant Chemical Engineer, Baton Rouge, 1954 to date.

GEORGE M. LIPSCOMB, Zachary; age 36. Endorsed: T. J. Innes, Jr., H. L. Landry, R. Meyer. Texas A & M, B.S.E.E. 1940. Registered E.E. Texas. The Texas Co., Port Arthur, Elec. Engr., 1940-42. U.S. Navy, Electronics Officer, 1942-45. The Texas Co., Port Arthur, Mtce. Engr. in Power House, 1945-49; Westville, N. J., Asst. Power House Foreman, 1949-52. DuPont de Nemours, August, Ga., Shift Supervisor and Area Supervisor of Power, 1952-54. Kaiser Aluminum & Chemical Corp., Power Supt., 1954 to date.

- ELIHU R. LUCAS, JR.**, New Orleans; age 30. Endorsed: N. J. Everard, D. W. Godat, W. S. Nelson, W. P. Wallace. La. State University, B.S.C.E. 1950. Registered C.E., La. Favrot, Reed, Mathes & Bergman, Designer-Draftsman, 1950-51. Bedell & Nelson, Designer Draftsman, 1951-55. David W. Godat & Associates, Feb. 1955 to date.
- HARRY C. MARTIN**, Monroe; age 43. Endorsed: E. J. James, H. M. James, S. S. Gill, W. S. Ware. Lehigh University, B.S.Ch.E. 1934. Member AIChE, Senior Member American Chemical Society. Registered Ch.E., La. Raybestos-Manhattan, Inc., Bridgeport, Conn., Asst. to Factory Mgr., 1934-36. Wilson Products, Reading, Pa., Chemist, 1936-37. Brown Paper Mill Co., Monroe, Chemical Engineer, Asst. Technical Director, 1937-41. U.S. Army, Major, Ordnance Dept., 1941-45. Brown Paper Mill Co., Inc., Technical Director, Director of Research, 1946-date.
- WILLIAM O. MARTIN**, Leesville; age 52. Endorsed: Oren Baker, T. F. Colbert, C. C. Edwards. La. State Normal College, 1922-23. Louisiana Highway Dept., Field Draftsman, Instrumentman, Chief of Party, Jr. Resident Engineer, Project Engineer, Resident Maintenance Engineer, 1930 to date. Registered Surveyor, La. Registered C. E., La. (Public Employee).
- STRUBBE McCONNELL, JR.**, Baton Rouge; age 44. Endorsed: D. A. Donald, T. J. Innes, Jr., R. Meyer. La. State University, B.S.E.E. 1939. Esso Standard Oil Co., Process Engineer, 1939; Head Employee Relations Research Dept., 1939-45. Esso-N.Y., Employee Relations Research Executive, 1945-46; Overseas ERR Executive Advisor, 1946-50. Esso-B.R., Cost Analysis Engr., 1950-51; Head Safety Engr., 1951-52; Head Statistics & Planning, M & C Dept., 1952-54; Division Mice. & Construction Engineer, 1954-date.
- WILLIE E. McGOUGH**, Monroe; age 31. Endorsed: J. T. Folk, T. R. Henry, A. D. Williams, Jr. La. Polytechnic Institute, B.S.M.E. 1943. La. State University, M.S.M.E. 1951. Member Instrument Society of America. Registered M.E., La. La. Power & Light Co., W. Monroe, Asst. Engineer, 1946-48. Gulf Engineering Co., Inc., Sales Engineer, 1948-50. The Brown Paper Mill Co., Inc., Monroe, Mechanical Engineer, 1951 to date.
- CHARLES E. METRALIER**, Baton Rouge; age 36. Endorsed: J. S. Burk, H. L. Landry, W. D. Poole, E. E. Evans. Notre Dame University, Mechanical Engineering, 1938-40. La. State University, B.S.E.E., 1948. Registered E.E., La., Ark. Utah Construction Co., Electrical Draftsman, Norfolk Dam, Ark., 1941. Ford, Bacon & Davis, Electrical Draftsman, Jacksonville, Ark., 1941-42. Morrison Knudsen Co., Chief Electrician, Celina, Tenn., 1942. Comstock & Emerson Co., Electrician, Ft. Wayne, Ind., 1942. U.S. Army, Electrician, Signal Corps, 1944-45. Fagan Electric Co., Little Rock, Electrical Designer, 1946. L. S. Houston, Consulting M. E., Electrical Designer, 1947. State Electric Co., Elec. Designer, Estimator, 1948. Stone & Webster Corp., Elec. Designer, 1948; field inspector, Gulf States steam generating plant, 1949-50. Bodman & Murrell, Architects, Electrical Engineer, 1950-52. Partner, Metralier & Ingram, Consulting Engineers, 1952 to date.
- HIRSCH C. MEYER, JR.**, Baton Rouge; age 32. Endorsed: L. Duclos, J. T. Huey, S. A. Nasca, J. B. Swanson. La. State University, B.S.C.E. Feb. 1949; M.S. Hydraulic Eng., June 1950. Registered C.E., La. U.S. Geological Survey, Hydraulic Engineer, 1948-51. Brown & Butler, Consulting Civil Engrs., utilities design, subdivision and street construction plans, 1951-53. East Baton Rouge Parish, Dept. of Public Works, Chief Eng. Draftsman and Senior Designer, 1953-54. La. Dept. of Highways, Senior Bridge Designer, April 1953 to date.
- WILLIS H. TAYLOR**, Monroe; age 27. Endorsed: J. H. Drake, J. T. Folk, J. E. Ross, Jr. La. Polytechnic Institute, B.S.C.E. Jan. 1950. Member La. Hwy. Engrs. Ass'n. Registered C.E., La. La. Dept. of Highways, Senior Instrumentman, 1950-51; Project Engineer, 1951-53; District Laboratory Engineer, 1953-date.

For Transfer From Junior To Full Member

- ROBERT E. LEE, JR.**, Baton Rouge; age 31. Duke University, B.S.M.E., 1948. Esso Standard Oil Co., Construction Coordinator, 3 yrs.; Budget preparation, 1 yr., Junior Process Design, 2½ yrs.
- MAGEE J. MOSS**, Abbeville; age 28. Southwestern La. Institute, B.S.C.E. 1950. Member La. Hwy. Engineers Ass'n. Registered C.E. (Public Employee) La. La. Dept. of Highways, Chief of Party, 1950-53; Junior Project Engineer, 1953; Senior Project Engineer, Sept. 1953 to date.
- WARREN M. ROBBINS**, Baton Rouge; age 34. Louisiana State University, B.S.C.E., 1947; M. S. Hydraulic Eng., 1948. Registered C.E., La. State of La. Dept. of Public Works, Civil Engr., 1948-51. USAF, Keesler Field, Project Officer for Expansion Program, 1951-52; Air Installations Staff Officer, Elmendorf AFB, Alaska, 1952-53. Kaiser Aluminum & Chemical Corp., Senior Design Engineer, 1953-55.

For Affiliate Member

DANIEL L. MAYER, New Orleans; age 35. Endorsed: D. B. H. Chaffe, Jr., H. M. Blain, C. R. Newlin. Southern States Equipment Co., Inc., Salesman of machinery such as crawler cranes, hoisting engine, pile driving equipment, road machinery, compressors, air tools, pumps, 7 years.

BERNARD P. WOLFE, New Orleans; age 34. Endorsed: F. Courtney, F. P. Fischer, L. K. Nelson. Tulane University, 1939-41; University College, 1951-54. U.S.M.M.A., Kingsport, L. I., N.Y., B.S. Marine Eng., Dec. 1946. Isthmian Steamship Co., 3rd Asst. Engineer, 1947-49. Self-employed, contracting, building, remodeling, 1949-52. F. P. Fischer Engineering Co., sales engineering, 1952-date.

For Junior Member

ALBERT J. DUNN, JR., Leesville; age 29. Endorsed: Oren Baker, C. C. Edwards, T. F. Colbert. La. Polytechnic Institute, B.S.C.E. 1952. Junior Member ASCE. Registered C.E., La. J. Ray McDermott Co., Inc., Harvey, La., Field Engineer, May 1952-Sept. 1954. La. Dept. of Highways, Alexandria, Project Engineer, Sept. 1954 to date.

JAMES B. KALMBACH, Shreveport; age 24. Endorsed: O. J. Dykes, Jr., Carl M. Hadra, E. M. Freeman. Georgia Institute of Technology, B.M.E. 1951; M.S.M.E. 1955. Registered M.E., La. Associate Member Sigma Xi, ASME. Member Tau Beta Pi, Pi Tau Sigma. U.S. Navy, Ensign (CEC) Utilities Officer, Kwajalein, M.E., 1952-53. Georgia Inst. of Technology, graduate study in ME as Gulf Corp. fellow, Sept. 1953-October 1954. Texas Eastern Transmission Corp., Junior Engineer, Oct. 1954 to date.

JAMES W. LYON, JR., Monroe; age 26. Endorsed: J. H. Drake, G. P. Forman, J. F. Mallette, J. E. Ross. La. State University, B.S.C.E. Feb. 1951. Registered C.E., La. La. Dept. of Highways, Senior Draftsman, Jan.-Nov. 1951. Corps of Engineers, U.S. Army, Lt. AUS Engineer Unit Commander, Nov. 1951-Nov. 1953. La. Dept. of Highways, Monroe, District Testing Engineer, Asst. District Lab Engineer, Jan. 1954 to date.

JOSEPH V. ROY, Baton Rouge; age 30. Endorsed: T. E. Alexander, W. G. Stewart, W. L. Sutton. La. State University, B.S.E.E., Jan. 1951. Reserve Officers Ass'n, Member. U.S. Army Corps of Engrs., Asst. Operations Officer, Engineer C. Bn., 1951-52. Copolymer Corp., Electrical Engineer, April 1953 to date.

CHARLES G. UPTON, Delhi; age 29. Endorsed: G. J. Forman, J. E. Ross, J. F. Mallette. Northeast Jr. College, Diploma in C.E., 1949. International Correspondence Schools, 1952-55. Diploma in C.E. (Selected units). La. Dept. of Highways, Monroe, Rodman, Jr., Field Computer, 1949-51. Brown Paper Mill Co., Head Chairman, Instrumentman, 1951-53. Kaiser Engineers, Richland, Wash., Engineers Aide, April-June 1953. La. Dept. of Highways, Senior Instrumentman, Aug. 1953-date.

Junior Membership Awards

DONALD W. BOENSEL, Graduate of Tulane University in Electrical Engineering.

JAMES M. OLIVER, Graduate of Louisiana State University in Agriculture Engineering.

For Transfer From Student To Junior Member

JOHN B. COFFER, Graduate of Southwestern Louisiana Institute in Civil Engineering.

RICHARD A. DUPUIS, Graduate of Southwestern Louisiana Institute in Civil Engineering.

J. BRIANT FOURNET, Graduate of Southwestern Louisiana Institute in Civil Engineering.

CARL J. HUVEL, Graduate of Southwestern Louisiana Institute in Civil Engineering.

BERTON J. PERRY, Graduate of Southwestern Louisiana Institute in Mechanical Engineering.

OTTO PROCHASKA, JR., Graduate of Southwestern Louisiana Institute in Mechanical Engineering.

CHARLES C. TRAHAN, Graduate of Southwestern Louisiana Institute in Civil Engineering.

ENGINEERING BRIEFS

Cost of Operating 5-Ton Heat Pump. Costs for operating a five-ton General Electric Weathertron heat pump in Louisiana Power and Light Company's Tallulah district for a one-year period recently were released by R. C. Paslay, commercial sales manager for the Company.

Paslay said, in making the figures available, that the unit was equipped with a booster heater strip to insure ample heat during unusually cold periods, but that record charts show that these strips never went on even though the temperature dropped to 18 degrees at one time. This meant, he stressed, that the five-ton unit was sufficient to take care of the heating requirements.

The installation was sub-metered and accurate records kept by months. The unit was installed in the Crow Drug Store in Tallulah last year as part of the modern installation of the firm's new building. Information on costs of the unit's operation, by billing months, follows:

June	\$41.36
July	68.02
August	67.26
September	69.96
October	73.17
November	40.33
December	26.89
January	29.95
February	34.37
March	36.87
April	33.45
May	48.28
Total	\$569.92
Average Month	47.49

Paslay pointed out that the owner followed LP&L's suggestion that the heat pump be allowed to operate 24 hours a day under thermostatic control. Louisiana Power and Light's "*Profit Builder*."

All-Electric Homes Are Constructed by California Builder. The world's first all-electric community has been opened at Fullerton, Calif., according to Ebasco Services, Inc., in New York.

Automatic heat or cooling comes from the same mechanical source, Ebasco says. The project of 431 homes has a heat pump for every unit.

In addition to the Weathertron heat pump, other electrical appliances included in the price of the home are oven, range,

dishwasher, garbage disposer, refrigerator, combination washer and dryer and water heater. Louisiana Power and Light's "*Profit Builder*."

Giant Underground Crusher Station in Canada. For the first time in its operations, the International Nickel Company of Canada has used the blasthole mining method to excavate a giant underground crusher station at Levack Mine in the Sudbury District of Ontario. The huge chamber, big enough to hold two average-sized 8-room houses is on the 2,650-foot level.

By adopting this method of excavation in preference to previously accepted mining practices, Inco was able to save more than two months in construction time.

Titanium Assemblies Fastened with Monel Rivets. To fasten titanium assemblies, aircraft builders discovered they needed a rivet of a different material. It had to be strong, yet ductile for easy upsetting without cracking. Now these assemblies are fastened with Monel rivets. "*Mechanical Topics*" of International Nickel Co., Inc.

Wristband Offers New Protection for Punch Press Operators. Wristbands which carry radium crystals on a lead-backed, pure nickel disc are a new protective device for punch press operators. Weak gamma radiations from the radium are picked up by special electronic tubes mounted on the machine. The tubes control the machine so that no one can start it who does not wear the wristbands. Yet they shut the machine off, even in midstroke, when the wristband wearer's hand approach a dangerous location. "*Mechanical Topics*" of International Nickel Co., Inc.

Two Noises Make One Silence. Fighting sound with sounds is the newest concept in the war against noise, *Chemical Engineering* says. A new machine has been developed that determines the frequency and character of an existing sound wave, then sends out its own sound of the same frequency but of opposite phase. Interference results and the waves cancel each other, giving a localized cone of silence.

Water Pistols for Plant Workers. Toy water pistols are standard equipment at a Montana oil refinery, according to the publication, *Power*. Workers squirt them at pipes to be handled, thereby finding out if the pipe is sizzling hot without burning their fingers. The pistols also are a sanitary alternative to spitting on the pipes, the magazine notes.

Pampered Pigs. Noting that Russia wants to learn the American way of corn-hog farming, the publication *Food Engineering* suggests that the Reds will have to learn to treat their pigs better than they do their peasants.

Stronger Cotton. Chemical modification of cotton fiber—by either actual production processes or by surface treatments—is resulting in a stronger, more useful fiber which still retains the original advantages of cotton, says *Chemical Engineering*. Numerous processes now are being applied that make the cotton fiber flame resistant, more receptive to dye and resistant to rot and acids.

Directions Via Record. A long-playing record that gives directions for checking a complex cable for circuits after assembly, has saved 89 per cent of regular checking time for a Pennsylvania engineering company, according to *American Machinist* publication. The LP disc, which dictates a sequence of instructions for checking the entire circuit, replaces a previously-used direction sheet which, although workable, required two and one-fourth hours for checking each cable, as compared to 15 minutes (including pauses in the record allowing the inspector to make connections) for the recording.

Margarine Consumption Up. Consumption of margarine totaled 1,364 million pounds in 1954 — an increase of 46 per cent in the five year period since repeal of the federal oleo taxes, according to *Food Engineering*.

Iced Golf Balls. Tire and battery makers have discovered that auto tires and batteries keep better under refrigeration, and have rented public refrigerated warehouses for storage, *American Machinist* reports, Golf balls, too, thrive on ice, creating a possible run on home refrigerators, with a bowl of golf balls finding its place next to the melon and meat balls.

Traffic Jams Pay? More and better traffic jams may be the answer to some states' budgetary problems, according to the publication *National Petroleum News*. One observer's reasoning: Traffic congestion in New York City costs motorists \$25 million annually in wasted gasoline, meaning more than \$3 million in added gasoline taxes for the state. The day is coming, he claims, when the state can finance all activities from traffic jams.

Work For Disabled. A California aircraft firm has developed an idea that is beneficial both to the company and to disabled veterans, reports *Factory Management and Maintenance* magazine. Each month, the company subcontracts 5,000 pounds of salvage materials (miscellaneous nuts, bolts, rivets, etc. left over from completed jobs) to the local Disabled American Veterans' organization for sorting. This work, not economical for the plant to handle, provides useful, profitable work for 40 disabled veterans, and saves the company money at the same time.

New Booklet of Value to Inventors. How to invent is the theme of a new booklet recently published by the Cleveland Engineering Society. Titled "Progress Through Invention," the 28-page booklet contains reprints of talks given at the first Invention Exhibit and Conference held at the Cleveland Engineering Society. It is available at \$1 per copy.

Six authorities cover various phases of the need for inventions, how to invent, how to patent your ideas, and how to sell them in this handy inventions manual.

Articles and authors featured in the booklet include "New Inventions and You," Joseph H. Gepfert, Reeves Pulley Co.; "What's in the Future," Clifford C. Furnas, University of Buffalo; "How to Invent—a creative guide," Waldemar Ayres, White Sewing Machine Corp.; "Human Side of the Patent Office," Ernest A. Faller, United States Patent Office; "How to Sell Inventions," C. H. Welling, Welling & Woodward, and "Inventing for Profit," Wallace Nichols, R. J. Rand & Associates.

The conference papers, originally printed in a magazine issue of Cleveland Engineering, have been published in booklet form because of the value of the ideas to engineers, technical people and other inventors. "Progress Through Invention" may be obtained from the Cleveland Engineering Society, 2136 East 19th St., Cleveland 15, Ohio.

L. P. I. CONFERENCE

The School of Engineering, Louisiana Polytechnic Institute, Ruston, Louisiana, announces the Fourth Annual Instrumentation Conference to be held on its campus on November 3rd and 4th, 1955.

The tentative program will include papers on the following subjects or embracing the following fields:

1. Instrumentation and Control of a Large Power Plant
2. Instrumentation and Control of a Compressor Station
3. Practical Applications of Industrial Flow Colorimeters
4. Butterfly Valves
5. Instrumentation in Catalytic Cracking
6. All Electric vs. Pneumatic Instrumentation
7. Aluminum Industry
8. Paper Industry

All companies or persons interested should contact the Instrumentation Conference Committee, School of Engineering, Louisiana Polytechnic Institute, Ruston, Louisiana.

CONSTRUCTION — THE NEW ORLEANS BRIDGE

C. B. Jansen, President, Dravo Corp.*

I have been requested to discuss with you the building of the foundations for the new Mississippi River Highway Bridge at New Orleans. I am of course very pleased to talk with you about that portion of this magnificent structure which a foundation contractor would obviously consider the most important and most difficult feature. It is our lot to pioneer every project, being the first on the ground and then, just when the work is becoming highly interesting, we fold up our tents, with the foundations completed, leaving the field to another outfit for the relatively simple though highly essential erection of superstructure. To the travelling public using the bridge, it probably appears to be all superstructure. The foundations are under water and hence of little evident moment. They would probably be very much surprised to find that there is much of man's ingenuity and unremitting toil intermingled with the concrete, steel and stone of the piers carrying the roadway high above the waters for the passage which he accepts so casually.

* Presented before the Society August 1, 1955.



New Mississippi River Bridge At New Orleans

My first twelve years with Dravo were spent almost entirely on the construction of bridge foundations and I have never lost my enthusiasm for this type of endeavor. As in every industry worth its salt, technological changes are always in process, and these have been substantial in this work since I first went underground. During those early construction years, most bridge pier foundations were built by sinking reinforced concrete caissons. Usually, provision was made for the use of compressed air in the event unexpected water-bearing soils were encountered, even though the operation might be planned for open dredged work. This generally was the method employed for going down any appreciable distance beyond the limiting characteristics of timber-sheeted cofferdams and the then somewhat novel, interlocking steel sheet pile single-skin cofferdams. The caisson method was used commonly for piers 35 to 45 feet deep. When the pier was to be seated on rock, compressed air was often used for the final stages of sinking and for cleaning out and sealing.

In the middle 20's, techniques were developed in using cellular steel sheet pile cofferdams which eliminated the main difficulties involved in initial use of that method for raising the battleship Maine in Havana Harbor. This simple process soon came into active use for unwatering large areas for lock and dam construction as well as for smaller operations, such as founding bridge piers. New procedures, using steel beams for internal bracing of single skin steel pile cofferdams, made it possible to go to greater depths. Improved pile-driving equipment plus use of H-beam and pipe piling and various types of concrete piling for foundations under piers eliminated the requirement for carrying masonry all the way to rock or firm foundation.

Economic developments further contributed to the technological changes. Labor costs of compressed air work became well nigh prohibitive. A sand-hog receives 8 hour's pay for only one hour's actual work under air in depths of 99 to 110 feet below water level and the same pay for only one-half hour's actual work in depths of from 110 to 115 feet. As construction costs increased, customers required the best thinking of design and consulting engineers. To get a job, the contractor had to use plenty of initiative and imagination in planning his construction method preliminary to bidding on the project.

As years passed, the use of reinforced concrete caissons for bridge piers finally has been limited primarily to those depths beyond the practical limitations of the less expensive methods.

Further, the open-dredged caisson is used instead of compressed air wherever possible simply because it is more economical. In any event, open-dredged caissons must be used on jobs deeper than

115 ft. below water—the legal limit for compressed air work. Today we find caisson sinking restricted primarily to major deep bridge foundations throughout this country.

There are two types of caissons for bridge pier construction—the “dry shoe” where the site is on land, and the “floater” where the site is in water. The dry shoe involves the “shoeing” of the bottom contract area or cutting edge of the caisson with structural steel to protect this critical point from damage as it is sunk. Outside and inside forms are set and concreted for exterior walls and interior dredging wells.

For the floating caisson, the shoe is much more elaborate, consisting of a water-tight floating cutting edge and working chamber and bottom portion of the caisson, which is anchored over the pier site. This is filled with concrete, and as it sinks into the water, exterior walls are extended upward by use of an attached cofferdam of timber and steel, while dredging wells are carried up by attachment of circular steel dredging tubes.

On occasion, to permit use of the dry shoe method for a river pier, a temporary “sand island” is built around the pier site, consisting of a circle of either structural steel or of interlocking steel sheet piling. This is then filled with sand and gravel or other stable material to above water level. The dry shoe is set on top of this “sand island”. Forms are set, concrete is placed, and the caisson is sunk to grade through the material inside the island and into the river bed.

Every caisson is a new problem. Each has its own individual personality—sometimes quiet and well mannered and at other times perverse and ill-tempered. To successfully undertake deep foundation construction, one must always be prepared for the unexpected. In this business, the usual becomes commonplace and normalcy is most unusual.

This is especially true in coping with the vagaries of sinking thousands of tons of mass concrete through swift river currents and sundry and various strata into the bowels of the earth.

The matter of location control in itself involves many peculiarities. Ordinarily the caisson becomes the base of the bridge pier, and after sinking, it is “sealed” with concrete to provide the necessary bearing. Consequently it must end up where the pier is supposed to be, usually within reasonably close tolerances of several inches. The “box” is liable to encounter almost anything from sunken barges to skeletons of prehistoric mammoths on its way down, and excavating and sinking may be complicated thereby. Hardness of the bottom may differ greatly from one end or side to the other, with resultant tilting and going out of level. Ordinarily the only way to cure this is to endeavor to lower the high side or end by excavat-

ing in the working chamber close to that portion of the cutting edge. If the caisson does not move readily, excessive digging may result and when she cuts loose she will probably go just as far in the opposite direction. Every time she tips, she goes off line one way or the other, and that means corrective measures to bring her back on line, usually by tipping in the opposite direction and "walking" back to where she belongs.

This method works fine in certain types of soils, whereas in other types of material — for instance in running sand — travel of the cutting edge may be in the opposite direction to that which is intended, so the distraught sinking foreman completely reverses his field and adopts the opposite tack, only to discover that as another stratum is entered the method he is using must again be reversed.

Skin friction on the caisson is of great importance. It is of course essential to have a sufficient weight of concrete to keep her moving downward as material is excavated from underneath. This weight must also overcome buoyancy from water if sunk "in the wet," or to overcome the equivalent amount of air pressure if the pneumatic process is used. Obviously the volume of concrete is kept at a minimum by the owner in order to reduce cost and dead load on the foundation material. Sinking through one type of material may develop extreme friction, such as through a hardpan of massed boulders, which have a tendency to "roll" against the caisson and bind. Other material may have lubricating tendencies, and certain types of river silt may provide totally inadequate support for proper control, and must be replaced by firm material before the shoe is set.

Occasionally jetting with water or air may be necessary to reduce the skin friction. Here at New Orleans, as in other work performed by our company, we use a special type of varnish on the outside of the caisson to reduce friction. Unfortunately we have never been able to prove what would happen if we had not used it and we are afraid to stop — so we just keep on using it based on favorable results of laboratory tests.

We occasionally run into a situation where it is necessary to place additional load on caissons in order to compensate for deficiencies in the weight of the concrete itself. We have experienced situations where we have placed the absolute maximum amount of load for which there was space on top of the caisson, with no appreciable result. On removing the weight, and for no obvious reason, the caisson has settled promptly and effectively.

These are only a few of the multitude of problems encountered in this business. There is no such thing as a normal caisson — this

we have found from bitter experience. The only solution is to expect the worst and it is just possible that the worst will not happen. But at the heart of the problem is the necessity for keeping the caisson plumb at all times and on line. With proper care exercised at the outset to maintain these two desirable situations, much time and effort is saved in the later stages when it is much more difficult to correct misalignment. And that is where the virtue of experienced supervision on a deep foundation job exhibits its greatest value.

It is a matter of common knowledge that this new project, now underway at the foot of Thaila Street, falls within the category of major deep foundation work. It involves superlatives both as to depth and size of piers, and especially as to length of its cantilever span. With a 1,575 foot main span, this structure will be the world's longest cantilever type highway bridge. It surpasses by 175 feet the main cantilever span of the East Bay section of the San Francisco-Oakland Bay Bridge, the previous record holder. Only two other cantilever spans in the world exceed that of this new structure. Both of these are railroad bridges — one spanning the St. Lawrence at Quebec — 1,800 feet; and the other being Scotland's Firth of Forth Bridge with a 1,700 foot span.

The Mississippi River — by virtue of its great depth in the lower reaches, its shifting bottom, and absence of firm rock for final foundation material, and its high flood levels — automatically requires the best in bridge design and construction. The Vicksburg Bridge was the first of these lower river structures, using pneumatic caissons. The Huey P. Long Bridge, approximately 10 miles upstream from the site of this new span, was the first using open-dredged caissons which were sunk through sand islands for founding the deep river piers. Baton Rouge was next, again using open-dredged caissons with sand islands. Natchez and Greenville were simultaneous projects, both with open-dredged floating caissons for the main river piers, and dry shoes for the shore piers. Many of the problems at Natchez were similar to those which we anticipate here at New Orleans. I will shortly draw on certain illustrative material from Natchez to indicate how we plan to proceed here, though of course the current project is on a scale considerably larger than that of the smaller structure "under the hill."

The new Mississippi River Bridge at New Orleans was designed by Modjeski and Masters as Consulting Engineers for The Mississippi River Bridge Authority. Members of the Authority are Captain Neville Levy, Chairman; William O. Turner, Vice-Chairman; Sen. Alvin T. Stumpf, Secretary; Richard W. Freeman, Treasurer; Robert L. Simpson; John W. Stone; W. Richard White; Frank X. Armiger, Administrator; Charles E. Cassagne, Jr.; Chief Engineer;

J. Raburn Monroe, General Counsel. George S. Covert, Director, Louisiana State Department of Highways, has actively participated in the bridge program.

The overall length of the three main spans of the New Orleans Bridge will be 3,019 feet. This main span will be supported by one main pier in the river, 550 feet out from the east or New Orleans shore. On the New Orleans side, the anchor pier will be on the land side of the Thalia Street Wharf, with an 853-foot span from this to the main river pier. The other anchor pier will be connected with pier No. 3 at the levee by a 591-foot span.

Bids were taken for the four main river piers on January 25, 1955. Dravo Corporation, at \$6,691,590, was low of five bidders. Work was started by the contractor on February 28, 1955, and has been proceeding steadily. Scheduled completion date for this portion of the work is December, 1956.

It was possible to get started almost immediately on Pier No. 1. This is a land pier with no particular complications from flood state of the river. It has been sunk as an open-dredge caisson. In plan, the caisson base is 38 feet wide, 90 feet 6 inches long and 71 feet high, and was carried to final elevation minus 65, seated on compact fine sand.

Pier 1 caisson is cellular with 20 dredging wells, each 14 feet 6 inches square. Final elevation for satisfactory foundation was reached on July 24. Next will come the cleaning of the working chamber by high-pressure jet. Then a tremie seal of submarine concrete 17 feet thick will be placed through tremie pipe. An 8-foot thick concrete distributing block will cover the tops of the dredging wells up to four feet below ground line. Two concrete shafts will rise 125 feet to a top elevation of plus 138.58.

To construct this caisson, a steel shoe, or cutting edge, was first laid out and assembled on the pier site. Temporary wood blocking carried the initial load. Reinforcing rods welded to the shoe bond it firmly to the mass concrete of the caisson.

Wooden forms were then built around the outside of the shoe and for the ten dredging wells. The concrete, heavily reinforced against sinking stresses, was carried up to 21 feet above the cutting edge.

After sufficient setting time, forms were stripped, material under the caisson was excavated carefully by clamshell bucket, blocking under the shoe was removed and the caisson was allowed to settle. Care was taken to keep it level at all times. With several feet of the structure still above ground, forms again were placed, another lift of 10 feet of concrete was added, forms were removed and other rounds of concreting and excavating followed until the caisson reached final grade.

The anchor pier, on the west side—Pier No. 4—will be approximately 400 feet in back of the levee. This will be a relatively simple structure, having a base 48 feet 6 inches wide by 122 feet long and 10 feet deep, supported by 490 timber piling 80 feet long. The top of this footer at elevation plus 7 will be one foot below ground level. Two concrete shafts, similar to those on Pier No. 1, will be carried 140 feet 11 inches to elevation plus 147.75. There is nothing out of the ordinary about this unit.

On the other hand, Pier No. 3 on the west bank, immediately in front of the levee, presents an interesting problem. The base is 61 feet 6 inches wide by 135 feet 6 inches long for the bottom 20 feet, at which point it steps in 6 inches for the entire periphery of the pier. Its height is 157 feet, founding at elevation minus 165 on still gray clay. This caisson, in common with Piers No. 1 and No. 2, is cellular. It has 21 dredging wells, each 14 feet 6 inches square. In addition to the main cutting edge, there also are two intermediate transverse cutting edges which divide the 4200-cubic yard tremie seal into three separate pours. As the ground line is at elevation plus 10, and the top of the caisson will be at elevation minus 8, an attached cofferdam of 6-inch tongue and groove sheeting, internally braced with structural steel, will follow the outline of the caisson to above ground line. The 10-foot thick distributing block spanning the wells will bring the top of the footer to elevation plus 2. Two concrete shafts will rise to elevation plus 161.5.

To construct this pier, a 150-foot long whirler trestle on the river side carries two all-steel, 30 ton capacity, completely revolving whirler cranes with 17 foot diameter rail circle. Crane rails are at elevation plus 30. The trestle is supported by 32 steel bearing pile 160 feet long, driven to 30 feet above the final planned cutting edge level of the caisson. Between the trestle and the pier site, a single row of arch-web steel sheet piling supports a shell fill to provide a semi "sand island."

Here in the dry the caisson shoe was assembled, formed, con-creted and sunk in much the same manner as at Pier No. 1.

Progress to date has resulted in sinking 11 feet to elevation minus 2, with 163 feet yet to go. This caisson will require 26,000 cubic yards of concrete.

I have left the description of Pier No. 2 until last because it is the key unit on the job and encompasses practically every challenging problem common to the most difficult underwater foundation construction projects. This pier will be sunk as a floating caisson. It is the only river pier on this job, being 550 feet out from the New Orleans wharf, and altogether too close to the main navigation channel for complete peace of mind. Consideration

must be given the vulnerable condition of the caisson itself, while still afloat and of the fleet of construction equipment surrounding it. Ocean freighters and river tows move up and down stream at all times of day and night, in weather fair, foggy and foul. That's the way it is, however, and that's the way it has to be. In view of these many difficulties and including, but not limited to, the swiftness of the current, it is necessary to schedule construction of this pier during the low water season.

The caisson base is 88 feet by 151 feet in plan below elevation minus 72, which is the river bottom. Mean low water is at elevation plus 2 and the caisson will be founded at elevation minus 180 on stiff gray clay.

The first operation at the pier site is to construct and sink a willow mattress 300 feet by 500 feet in area (approximately 3-½ acres) to prevent scour. This mattress will be woven at Plaquemine, La. Sturdy willows, cut from the river bank, will be trimmed and laced firmly together on previously prepared assembly and lashing ways. Heavy wire and steel cables will insure a completed unit that will stand the terrific stresses experienced during the process of sinking to the river bottom at the pier site.

The mattress will be towed to the bridge site, anchored and centered approximately over the pier location where it will be held in place with cables and anchors.

Towing to the site will be no small task, and anchorage and sinking to accurate location will require the skill of experienced rivermen. Sixteen headline anchor cables approximately 1,200 feet long will run from concrete blocks in the river bed to the mattress and the mooring barges across the upstream end of the mattress. These barges, together with others along both sides and the downstream end of the mattress, will act as a temporary supporting "frame," with manila lines securing the mattress to the barges. Lateral cables carried to side anchors will steady the mattress in its position over the pier site, while three tail anchors downstream from the mattress will counteract the tendency of the upstream anchor cables to sag and pull the mattress out of position.

The next step is to distribute the ballast of one and two man stone over the entire area of the mattress. When loaded sufficiently to overcome buoyancy, the manila lines holding the mat to the mooring barges will be released simultaneously, allowing the mattress to settle to the river bottom. This is the point at which the workmanship and skill in assembling the unit will prove their value.

After the mattress is placed, a stall—actually a steel U-shaped barrier or fence—will enclose the pier area to hold the floating

caisson steady while it is sinking to the river bed. The rigid portion of this stall will be 40 feet high. When in place it will extend from elevation plus 15 to minus 25. It will be supported by thirty-nine 36-inch diameter steel pipe piles 150 feet long and driven 60 feet into the river bed. These will be filled with sand and gravel to provide stability and internal support against crushing.

The pre-fabricated units of the stall were assembled at our Pittsburgh yard and were barged to the job where they are stored ready for us. Putting these together and lowering and positioning in the middle of the river will be a relatively simple task.

The upstream end of the stall will be surrounded by a semi-circle of steel sheet piling driven vertically, to cut off the current. Vertical guide beams will be driven into the river bottom on both sides and across the upstream end to hold the caisson in exact location as it sinks through the water.

The steel floating caisson, weighing 500 tons, will be floated into the open downstream end of the stall which will then be closed off with horizontal members, after which the two downstream vertical guide beams will be driven.

After it is moored in the stall, the top of the floater will be extended vertically by an attached cofferdam of 6 inch tongue and groove sheeting, internally supported by 14 steel bracing sets. Inside the cofferdam will be twenty-eight 18-foot diameter steel dredging tubes.

The tops of the tubes and the attached cofferdam will be kept safely above water level at all times. When the caisson settles firmly on the bottom of the river, excavation through the dredging tubes with clam shell bucket will be started. The same procedures as on the shore pier will be utilized at Pier No. 2; that is, alternately dredging and concreting until the caisson reaches final elevation. In addition to the peripheral cutting edge, this caisson will have one intermediate longitudinal and two intermediate transverse cutting edges. These will divide the 21-foot tremie seal into six pours.

Free jets, carried down the dredging wells, will be used if necessary to loosen material beneath the cutting edge in the course of sinking, and for cleaning out the bottom of the caisson when it reaches final grade. Water levels inside and outside the caisson will be equalized at all times. The caisson will never be pumped out, except in the area between the attached cofferdam and the dredging wells, where minor leakage through the attached cofferdam will be removed as necessary.

When the caisson finally reaches bottom and has been cleaned out, a submarine seal of 6,800 yards will be placed through tremie pipes, using two mixer boats as a source of supply. This caisson will eventually incorporate 35,000 cubic yards of concrete.

After sealing, a 10-foot thick distributing block will cover the dredging wells from elevation minus 15 to elevation minus 5. A single pier shaft, stone faced with rounded ends, will rise from elevation minus 5 to plus 30. Above this, two concrete shafts similar to the other piers, will carry up to elevation plus 161.5.

A project of this nature could not proceed satisfactorily without four important ingredients.

The most mechanical of the four, probably the easiest of attainment, (and fourth in order of importance) has to do with construction equipment which is placed on the job for carrying out the work. However, this is an area where the contractor's planning must be at its best, for swift water and heavy construction can be economically and speedily handled only with the proper mechanical devices. In this particular instance, the best of equipment was assembled, floating it to the job from various other completed projects.

Since concrete is an essential element here and must be mixed and placed according to the most modern techniques, two floating mixer plants with identical batching and mixing equipment have been brought to the job. Both are equipped with two 2-cubic yard tilting mixers, capable of delivering 80 cubic yards of concrete per hour from each plant or a total of 160 cubic yards combined. In the larger pours, the two plants will be in simultaneous operation.

Fully automatic batching equipment is provided on each of these boats, making it possible for one operator at the "console" to weigh and charge the prescribed concrete ingredients and to discharge the mixers into the transfer buckets. These are in turn handled by derrick boat or whirler crane to the point of placement.

Two other major pieces of equipment are full revolving derrick boats, both of 50 ton capacity. One of these just came from the construction of the foundations for the new bridge over Newark Bay near New York City, and is equipped with a 165-foot boom for topping out the high piers. The other has a 175-foot boom and came here at the start of the job from building a dam for the Corps of Engineers, U. S. Army at Greenup, Kentucky, on the Ohio River.

The towboat *Pioneer* will service the job for handling the floating equipment, sand, gravel, cement and other construction materials. Land work will be handled by the two big whirler

derricks on the trestle at Pier No. 3, and by supplementary caterpillar and rail-mounted cranes. Necessary barges fill out the carefully-planned equipment set-up which will carry this job through to completion without any weak links in the chain.

The second ingredient of the four—and the first to be accomplished—is planning, and that has been carried out by the people of New Orleans and of Louisiana, utilizing to the fullest extent the engineering capacities of many of this organization. All of this has been performed by and under the jurisdiction of the Mississippi River Bridge Authority, after many years of determined effort.

The next ingredient is design. This has been handled in this instance by Modjeski and Masters, well-known for their many years of practical experience as consulting engineers on deep foundation work. They have established an enviable record of accomplishment and we are very pleased to be working under their direction on this project.

The fourth, but not least important of the four, covers the men—the organization—who handle the construction work. These include the field forces of the consulting engineer, under whose supervision the work is carried out, and the “on-the-job” construction crew of the contractors. One of the most satisfactory relationships that I know of today is that which involves the coordinating and “control” function exercised by the customer, represented by his consulting engineer on the job, and the carrying out of the physical work by the contractor’s forces, after being awarded the job on a lump sum bid. We see this working at its best on this New Orleans project, with the field representatives of Modjeski and Masters headed by Mr. Sorgenfrei and Mr. Durfee, handling operations for the Mississippi River Bridge Authority, while the contractor’s organization—superintendent Parker and his assistant superintendents, engineers, office force, foremen and workmen—carry out the daily tasks so essential to the finished project.

I’d like to say on behalf of Dravo Corporation that we are most happy at the courteous and cooperative treatment extended us and our people in your midst. We see demonstrated here an evident desire to expedite the completion of this great structure in many practical ways. Although our supervisory force are not necessarily native to this area, the majority of the workmen on this bridge have lived and worked along the Mississippi in most instances all their lives. They bring to this project a skill that is only of the best and we are proud to have them as part of our construction organization. It is a privilege to be a part of this great undertaking.

THE TRANSISTOR—ITS NATURE AND APPLICATIONS*

By Joseph Dechovitz, Toll Transmission Engineer, Southern Bell Telephone and Telegraph Co., Atlanta, Ga.

It is a well known fact which will bear repeating—we live in a golden age of scientific and technological achievement. In fact, new ideas and inventions pour forth from laboratory and factory in such overwhelming volume that many a practicing engineering, who must choose and apply these innovations, is sorely tempted at times to “cry uncle”, and to ask for a brief respite from this abundance of ingenuity.

Yet, every once in a while, a new invention will appear on the scene, and it will grip the imagination by the simple elegance of the thinking behind it, and by its many practical possibilities. The transistor is such an invention.

Since June, 1948, nearly seven years ago, when the invention of the transistor was announced by the Bell Telephone Laboratories, there has been considerable development in the field. Several new transistor types have evolved as a result of intensive activity by many. A staggering volume of literature has been published on the subject, in technical journals, and in periodicals with a wide popular circulation.

It would appear realistic then, in approaching the subject, to outline the scope of the discussion. In the language of the military, the available fire power will be concentrated on limited fundamental objectives. Interest is likely to be stimulated most by creating a picture of a transistor in action. A well defined image of the transistor can be created in the mind's eye by stressing the fundamental principles underlying the operation of basic transistor types. These are the point contact transistor, and the junction transistor.

The objectives set for this discussion are:

1. To trace the historical background of the invention, from the inception of the idea to its embodiment in the transistor.
2. To examine the fundamentals of semiconductor theory, particularly as related to transistor electronics.
3. To outline the transistor's salient electrical and physical characteristics. In the course of the discussion, the advantages and the remaining limitations of the transistor will be pointed out; its actual and contemplated practical applications.

* Presented before the Society Nov. 1, 1954, a joint meeting with A.I.E.E.

The transistor is an electronic device capable of amplifying electrical signals. In the performance of its functions, the transistor in its commonest form utilizes the unique properties of the semiconductor material germanium. The electrical signals are amplified as they are transferred through a germanium resistor. Hence, the derivation of a new word in the language—transistor—using the first part of the word “transferred” and the last part of the word “resistor.”

The historical background of the invention dates back to the war years 1940-1945. During that period, a number of university scientists and scientists from several industrial research laboratories were engaged in the development of a crystal rectifier suitable for the high frequencies of radar. A great deal was learned about the physical properties of germanium and silicon as a result of this wartime effort.

Research in germanium and silicon continued after the war by several organizations. At the Bell Telephone Laboratories these studies were conducted by the Solid State Research Group under the direction of Dr. William Shockley, a physicist of note. The purpose of the work was to add to the fundamental knowledge of semiconductor properties, always keeping on the alert for possible practical applications of uncovered facts. Dr. Shockley believed that electrical signals could be amplified in a solid, even as they are amplified in the familiar vacuum tube.

This idea goes back to the crystal detector used in early radio sets, and the vacuum tube diode detector. The current-voltage characteristic of the two devices is similar. Since the vacuum tube amplifier, as we know it today, was made possible by inserting a grid between the filament and plate of a vacuum tube diode, many felt that a crystal detector could be made into an amplifier by somehow adding a grid to it.

Further impetus was given this idea at the Bell Telephone Laboratories by mathematical studies which confirmed that amplification is possible in semiconductors, or at least, is not contrary to accepted semiconductor theories.

To prove the possibility of amplification in semiconductors, Dr. Shockley devised an experiment using a condenser. One plate of this condenser was made of metal; the other plate of the condenser was a thin layer of germanium on a supporting insulator. A battery was connected to the two terminals of the germanium layer through a resistor load. It was Dr. Shockley's thought that by charging the condenser by means of still another battery, the supply of mobile electrons in the germanium layer would be increased amplifying the flow of current through the semiconductor layer and the resistor load. The implications of the successful outcome of such

an experiment are more or less obvious; with a very good dielectric in the condenser the input power requirement of such a device would be negligible, and appreciable power gain would be obtained in the output.

When the experiment was tried, however, only a small percentage of these electrons was mobile;; the rest of them got tangled up.

Dr. Bardeen, of the Bell Telephone Laboratories staff, explained in his theory of "surface states" that the electrons got trapped in the germanium surface. The theory suggested further tests conducted by Drs. Bardeen and Brattain. At one stage, a germanium filament with two cat whiskers was immersed in an electrolyte connected to a battery; when the electrolyte was replaced with a metal plate, transistor action was discovered.

The invention of the transistor is a success story in fundamental research. More than that, it is another impressive manifestation of what teamwork can accomplish. A group of talented scientists and engineers, working within the framework of an industrial organization, have deliberately transformed a germ of an idea into a commercially useful product.

It is an established policy in the Bell System to make available its inventions to others. This policy is implemented by publication of scientific work and through patent licenses offered by the Western Electric Company. Some forty odd companies have been licensed to manufacture and sell transistors; another 500 concerns have been licensed to manufacture products containing transistors.

To disseminate information, a symposium was held at the Bell Laboratories in September, 1951, on the characteristics and application of the transistor. This symposium was attended by some three hundred engineers and scientists.

Another symposium was held in April, 1952, devoted to the dissemination of "know-how" to licensees of Western Electric Company.

In the summer of 1952 a brief course was given to university professors attended by representatives from thirty institutions of higher learning.

Such, in brief, is the genesis of the transistor, and an account of how it was brought into the world.

What makes it tick?

It was mentioned earlier that the transistor, in its present state, utilizes the physical properties of the semiconductor germanium. It follows that an understanding of the properties of germanium is basic to the understanding of transistor action.

The element germanium was discovered in 1886. A German scientist named Winkler analyzed a silver mineral argyrodite. He accounted for 93% of the ingredients in the mineral. In the remaining 7% he recognized an element predicted in the periodic table and named it after his country.

The properties of germanium of greatest interest are in its atomic structure. We know that all matter in the universe is composed of atoms, and the atom in turn consists of a nucleus surrounded by negatively charged electrons.

A physical conception of the atom would include the central nucleus surrounded by concentric shells containing the electrons. The germanium atom has four such shells; the first shell has two electrons, the second shell has eight electrons, the third shell has eighteen electrons, and the fourth shell has four electrons—a total of thirty-two electrons. The four electrons in the outer shell define the valence of germanium which is tetravalent, or, in other words, has a valence of four.

These valence electrons bind the germanium atoms tightly with electron-pair, or valence bonds. Each atom contributes one electron to a bond, and each atom is closely associated with four other atoms.

Such an arrangement of atoms makes for a stable structure and suggests why germanium is a semi-conductor—that is, its effectiveness in conducting electricity falls somewhere between good conductors and the poorest conductors, or insulators. A good conductor has freely moving electrons.

The atomic structure of germanium has been carefully studied. The array of atoms forms simple cubic lattices in building the germanium crystal. Scientists know a great deal about these tiny structures. For instance, it is known that the dimension "a" of the cube is 5.62×10^{-8} cms. and that the cube contributes eight atoms to the density of the material. It can be computed from the above data that the number of germanium atoms per cc is 4.5×10^{22} .

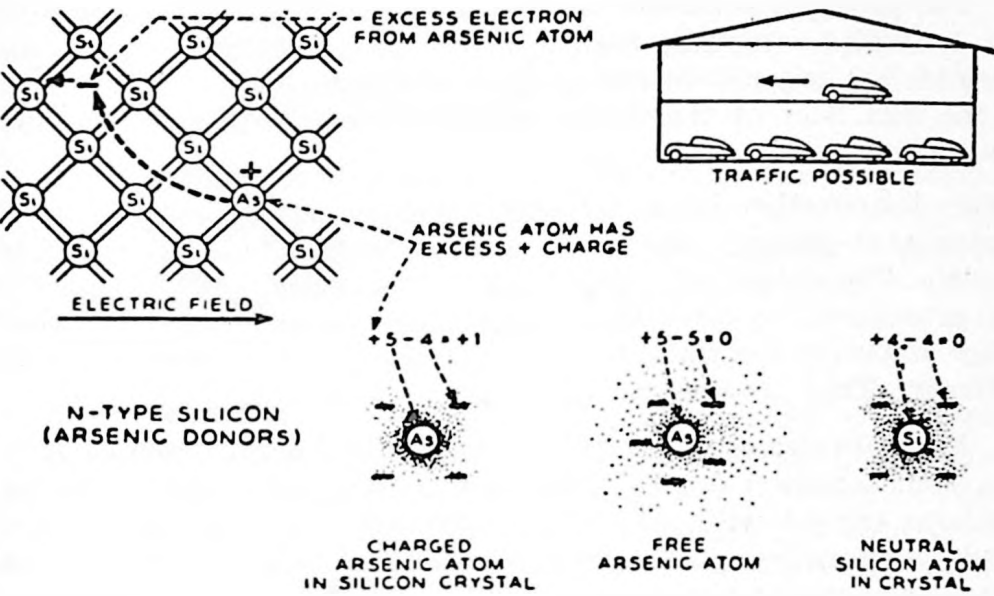
The germanium crystal is a stable structure, with only a limited inclination to conduct electricity. However, to build an amplifier the minimum requirement is to produce a controllable flow of electrical current. The magnitude of electrical current varies with the number and velocity of freely moving, electrically charged particles.

The question naturally arises how to produce freely moving, electrically charged particles in a crystal of germanium. Preceding material brought out the fact that the potential carriers of electricity in germanium — the valence electrons — are engaged in valence bonds.

It is a basic fact in semiconductor theory that current can be produced by the familiar electrons and by the less familiar holes

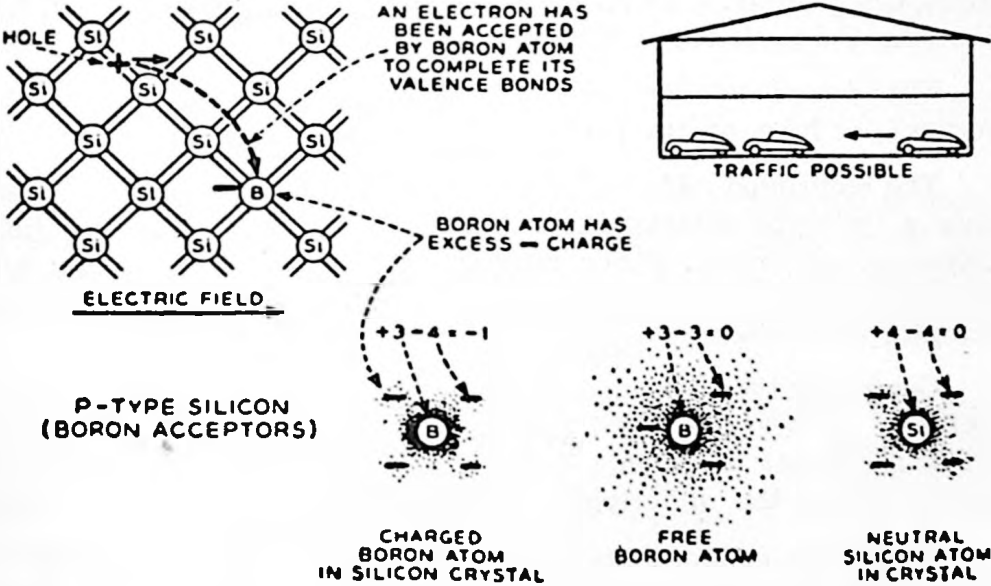
in motion. It will help in this discussion to consider the hole as the electrical equivalent of the electron in every respect except one: The electron is negatively charged; the hole behaves as if it were a positively charged particle.

How are free electrons and holes produced in semiconductors such as germanium or silicon? Fig. 1 will illustrate one of the methods.



Excess or Electron Conduction in Silicon Containing Arsenic.

FIG. 1



—Defect or Hole Conduction in Silicon Containing Boron.

FIG. 2

The top left section of Fig. 1 shows the atoms of a silicon crystal with all valence electrons engaged in valence bonds. Suppose one of the silicon atoms is replaced with an arsenic atom. The element arsenic has a valence of five — that is, five electrons in its outer atomic shell. Four of these electrons will become engaged in electron-pair bonds with four neighboring silicon atoms; but the fifth electron will be left free to wander.

The principle is further illustrated by the two floor garage in Fig. 1. With no impurity such as arsenic in the silicon crystal, all electrons are engaged in atomic bonds; this situation is analogous to the first floor of the garage all filled with cars allowing no movement.

The introduction of a wanted impurity such as arsenic is analogous to placing a car on the second floor where movement is possible. The controlled addition of an impurity such as arsenic will produce an "n" type semiconductor which has excess electrons. Other impurity elements of the same type are phosphorus and antimony. They are referred to as donor impurities.

Fig. 2 illustrates the principles of producing hole conductivity in a semiconductor. Again, the top left section shows the atoms of a silicon crystal with all valence electrons engaged in valence bonds. Suppose one of the silicon atoms is replaced with a boron atom. The element boron has a valence of three — that is, three electrons in the outer atomic shell. Since the boron atom has only three valence electrons, it cannot complete valence bonds with four adjacent silicon atoms. There is a hole in one of the bonds which can be filled with an electron from a neighboring bond, thus allowing the positively charged hole to migrate away.

The idea of hole conduction is analogous to the garage with a vacancy, or hole, on the first floor allowing movement of cars.

The controlled addition of an impurity such as boron will produce a "p" type semiconductor material which has excess holes (defect of electrons). Other impurity elements of the same type are aluminum, indium, and gallium. They are referred to as acceptor impurities.

Conductivity of semiconductors can be modulated by other methods. A beam of light falling on a germanium crystal will break a number of valence bonds, and will produce electron-hole pairs; such is the underlying principle of photo-transistor action.

Similarly, conductivity in germanium can be induced by bombarding it with radioactive particles; these particles also break up valence bonds and produce electron-hole pairs.

The great advances which have been made in the manufacture of reliable transistors can be accounted for in large measure by the "know-how" for producing single homogeneous germanium crystals of great purity — about one part of unwanted impurities in 10 billion parts of germanium. Another important contribution to transistor electronics is the development of techniques for producing P-N junctions in single homogeneous crystals of semiconductor materials.

It may be interesting to note that about twelve years ago the cost of pure germanium was \$4,500.00 a pound; the cost of pure germanium now is around \$450.00 a pound.

Among its many outstanding features the small dimensions of the transistor are most prominent. The device has been described on occasions by transistor enthusiasts as the "mighty midget" and the "tiny tot". Both are fitting descriptions. The point-contact transistor originally invented is packed in a metal cartridge about $\frac{1}{4}$ " in diameter and $\frac{1}{2}$ " long.

A germanium pellet, twenty mils thick and fifty mils square, is soldered to a brass mounting plug which is also pressed into the cartridge. The germanium is of the n-type, rich in excess electrons. Two phosphor bronze wires—five mils in diameter are pointed, bent and welded to nickel mounting wires. These nickel wires are previously molded into a plastic plug which fits into the other end of the cartridge. The unit is vacuum impregnated with wax through the hole in the cartridge. The phosphor-bronze wires are also wedge-shaped at the contact ends to permit close spacing of the two wires. The separation between the point-contact wires is only two mils.

A schematic diagram of the transistor in a simple electrical circuit is shown in Fig. 3.

The transistor is a three terminal device. One terminal is called the emitter, the second terminal is called the collector. These two terminals are the "cat's whisker" point contacts on the germanium surface. The third terminal is called the base; it is the metal plug to which the germanium pellet is soldered.

In a transistor using "n" type material, the emitter is biased positively with respect to the base, also described as biased in the forward or low-resistance direction. The collector is biased negatively with respect to the base, otherwise described as biased in the reverse direction or high-resistance direction. In our circuit the input is applied between the emitter and the base and the output is taken between the collector and the base.

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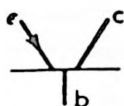
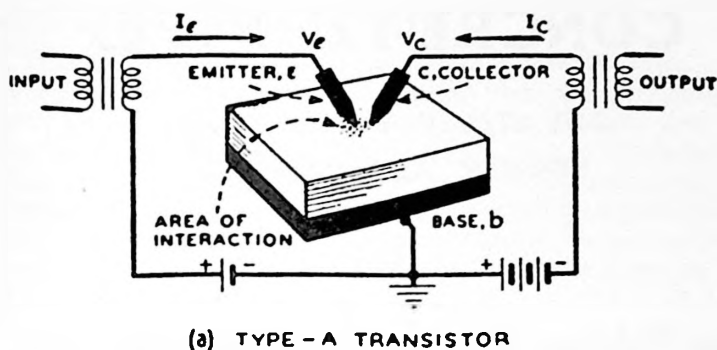
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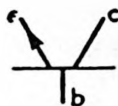
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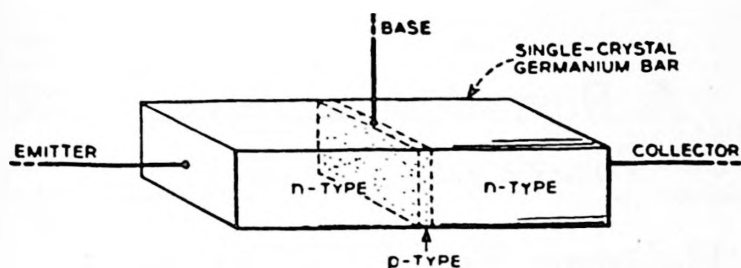
(b) SYMBOL FOR n-TYPE



(c) SYMBOL FOR p-TYPE

-Schematic Diagram of Transistor.

FIG. 3



-The heart of an *n-p-n* transistor is a tiny bar of germanium to which three mechanically strong electrical connections are made.

FIG. 4

Drs. Bardeen and Brattain discovered that when the input point of the transistor is biased for forward current flow, it becomes surrounded by an area of interaction; if the output point is placed within this area, the input current controls the output current in such a way that power gain results. The area of interaction is not sharply defined and the power gain in one conventional circuit varies from 20db for a separation of two mils, to 0 db gain for a separation of ten mils between the emitter and collector points.

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The explanation of the physical processes in the transistor leading to power gain is as follows:

The high resistance collector emits a few electrons into the germanium resulting in a small current from the germanium into the collector circuit. The emitter injects holes into the germanium; these holes are attracted by the potential field of the collector resulting in an increased collector current. The explanation so far suggests how changes in the input current are reproduced in equivalent changes in the output current. However, no explanation was advanced so far why the changes in the output current are amplified by a factor of 2, 3, or even higher.

It is further suggested that the holes, as they drift under the influence of the electric field, do not enter the collector immediately. These positively charged holes, in a brief period of hesitation, change the space charge in the area of the collector point causing a further emission of electrons from the collector into the base. This process explains the amplification of input current changes in the output circuit. Considerable power amplification results from the fact that this amplified current is taken from an output resistance which exceeds the input resistance by a ratio of about 40:1.

PRELIMINARY DATA FOR TYPE-A TRANSISTOR

Typical Operating Conditions		Average Equivalent Circuit Parameters (ohms)	
Emitter Current	0.6 ma	$r_{11} = 530$	Emitter Resistance $r_e = 240$
Emitter Voltage	0.7 volt	$r_{12} = 290$	Base Resistance $r_b = 290$
Collector Current	-2 ma	$r_{21} = 34,000$	Collector Resistance $r_c = 19,000$
Collector Voltage	-40 volts	$r_{22} = 19,000$	Mutual Resistance $r_m = 34,000$
		$\alpha_e \approx \alpha \equiv r_{21}/r_{22} = 1.8$	

Maximum Ratings: Not to be exceeded in continuous operation. Voltages relation to base.

Collector Voltage -70 volts

Collector Dissipation 0.2 watt

Grounded Base Operation: Class A, working from a 500-ohm generator into a 20,000-ohm load.

Operating Power Gain ~ 17 db

Power Output ~ 5 mw

FIG. 5

Fig. 5 illustrates the general range of transistor parameters as well as the voltages and currents for typical operating conditions. It will be noted that the input and feedback resistances are in the range of several hundred ohms; the output and forward resistances are in the range of 10,000 to 100,000 ohms. Note that emitter volt-

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age is a fraction of a volt and the collector voltage is forty volts and the currents are in the milliampere range ($I_c = 0.6$ ma, $I_c = 2.0$ ma).

The Type-A point contact transistor has a noise figure of 55-60 db. for a band of 1000-10,000 cycles; at a megacycle the noise figure of point-contact transistors of more recent manufacture.

The cut-off frequency of the Type-A transistor is five megacycles. The frequency response of the latter type point-contact transistors has been extended to about 50 megacycles.

The junction transistor is a logical evolution of the point-contact transistor. A brief review and extensions of the point-contact theory is timely. The amplifying action of the point-contact transistor is due to the injection of holes into the germanium, and the emission of additional electrons by the collector as a result of space charge changes effected by holes in its vicinity.

Further studies into the nature of the point-contact transistor furnished evidence that there are small semispherical formations of "p" type material underneath the emitter and collector points when the bulk material is of the "n" type.

It was also found that the collector action is improved by passing current through it in the reverse direction for a matter of seconds. This "forming process" enhances the amount of "p" type material under the collector point.

The semiconductor material in the point-contact transistor can be described as consisting of "p" type in contact with emitter electrode, "n" type material which forms its bulk in contact with the base, and "p" type material in contact with the collector.

Such is the make-up of the "p-n-p" junction transistors. Junction transistors of the n-p-n type can be made in similar fashion. It is important that these material junctions are obtained in a single pure crystal.

Dr. Shockley of the Bell Laboratories published the theory of the junction transistor in 1949. The realization of his predictions came in 1951.

The junction transistor is very small in size—about the size of a grain of corn. The germanium crystal is sometimes packaged in a plastic bead, and mechanically strong electrical connections are made to the three electrodes and brought out as pigtails through the plastic bead. Other junction transistors are hermetically sealed in metallic containers.

The make-up of an "n-p-n" junction transistor is shown in Fig. 4. It will be noted that the "n" type material on either side of the junction serves as emitter and collector, and the sliver of "p" type material in between is the base electrode.

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The physical theory underlying the operation of the junction transistor can be explained as follows:

As in the case of the point contact transistor, the emitter circuit is biased in the forward direction and the collector circuit is biased in the reverse direction. The p-n junction in the collector circuit when biased in the reverse direction has a high resistance—in megohm range.

The carriers from the emitter diffuse through the base region and are attracted to the collector through a high output resistance.

The current amplification ratio is somewhat less than one (.99). Gains in the range of 40-50 db can be obtained because of the high ratio of the output to the input resistances.

The noise figure of the junction transistor is comparatively low: 10-20 db at 1000 cycles per second; it also enjoys freedom from short circuit instability since the current amplification factor is less than one.

The frequency response of the early junction transistor was limited to a few kilocycles. This limitation has been overcome largely in more recent types of junction transistors, which will be discussed in subsequent material.

The invention of these basic transistor types—point-contact and the junction—led to the development of many other types of transistors. A brief discussion of the more promising types should be profitable.

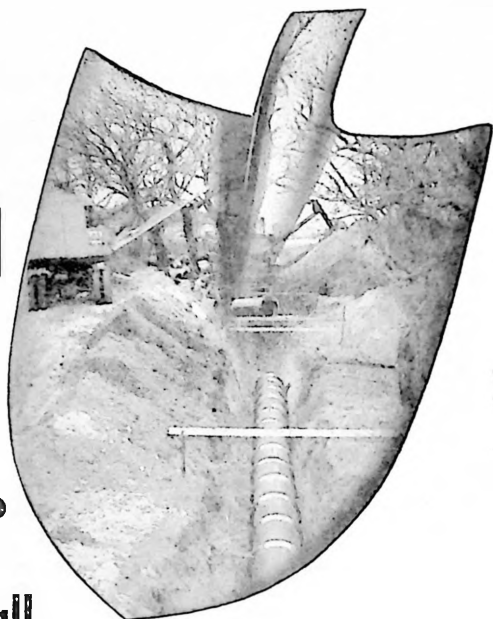
It was brought out in the discussion of atomic properties of semiconductors that light energy falling on germanium materials will liberate electron-hole pairs and thus modulate the conductivity of the material. This property was utilized in the development of the phototransistor. The photo-transistor is built of a germanium disk, $\frac{1}{8}$ " in diameter and 20 mils thick. A dimple is ground in one face of the disk and a phosphor-bronze collector wire is placed in the center of the dimple; the thickness of germanium at that point is 3 mils.

When light energy is permitted to fall on the opposite face of the germanium disk, the photo-current in the collector increases. Since the sensitive area of the photo-transistor is only eight mils in diameter, a focusing lens is used on the germanium face energized with light.

The photo-transistor has been in practical use in connection with automatic switching of long distance telephone calls and has proven itself to be a reliable device.

One of the great advances in transistor design came with the invention of the tetrode transistor. The tetrode transistor is a junction transistor of the n-p-n type to which the fourth electrode

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was added to the base; also, the base material ("p" type) was made thinner. The fourth electrode places a dc bias on the base. The result is an extension of frequency response of the junction transistor to 50 megacycles as an amplifier and 130 megacycles as an oscillator. The result is achieved as a result of the thinner region through which the minority carriers must diffuse; the fourth electrode, biasing the base, effectively reduces the emitter and collector capacitances—both causes of poor frequency response in earlier junction transistors; the fourth electrode bias also reduces the spread in the paths traveled by the emitter current.

A more recent development in the field of transistor electronics is the invention of the intrinsic barrier junction transistor at the Bell Telephone Laboratories. The intrinsic barrier transistor is a junction transistor of the p-n-p or n-p-n type to which a small amount of pure (intrinsic) germanium was added in the region between the collector and base. Theoretically such a transistor should be able to handle frequencies up to 3000 megacycles. Laboratory models with a frequency cut-off of 400 megacycles have been produced.

Many advances have been made in recent years in the reliability and reproducibility of transistors; considerable improvements have been effected in the transistor's frequency-response, noise figure, and its power requirements seem to have been lowered to an irreducible minimum.

A great future is predicted for this young prodigy in the field of electronics, and some of this future is materializing before our eyes in commercial applications of transistors in several fields. Transistorized radio sets are beginning to make their appearance on the market. The photo-transistor, transistor amplifier and oscillator have been in use in the telephone business for several years; a transistorized carrier system is under active development.

It has been estimated that 90% of jobs now done by vacuum tubes can be done with transistors. Much, however, remains to be done. The cost of transistors must be reduced to competitive levels. Just now the transistors on the market are expensive—\$4.00 to \$30 each. The power handling capacity of transistors must be expanded, and stability under high temperatures improved.

On the other hand what are the qualifications which may give the transistor preeminence in the field of electronics? Let us tabulate them:

1. Small size, light weight, ruggedness.
2. The life of transistors has been estimated at upwards of 70,000 hours.

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People of imagination believe that the brave new world of the future will be a world of computing machines, automatic switching systems, automatic production centers, etc. It would appear that the transistor possesses many characteristics which will speed the realization of many of the scientist's and engineer's dreams.

REFERENCES

- W. Shockley, "Electrons and Holes in Semiconductors".
Mervin J. Kelly, "The First Five Years of the Transistor".
Bell System Technical Journal.

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MINUTES OF THE MEETINGS AND BUSINESS OF THE SOCIETY
Minutes of Meeting of the Board of Direction Held on May 2, 1955

The meeting was called to order by President Seago with Messrs. Drawe, Freeman, Macdonald, McLellan, Taylor, Wallace and Fernandez present. Mr. Macdonald moved that minutes of the preceding meeting be accepted as read, seconded by Mr. Freeman and carried.

Mr. Wallace, Chairman of the Finance Committee, presented a financial report for the quarter ended March 31. Mr. Macdonald moved that the report be accepted, seconded by Mr. Wallace and carried.

The secretary read a letter forwarded by Mr. Felix Alcus, Chairman, Committee on Honors and Awards, to each member of his committee. Board members were urged to give careful thought to possible recipients of the society's two medal awards.

President Seago advised that Mr. Todd, recently appointed Chairman of the Special Activities Committee, was unable to accept because of other commitments, whereupon the president appointed Mr. Lionel J. Cucullu to the chairmanship of this committee.

The secretary reported that the Annual Outing Committee had held a very successful meeting on the preceding Monday and that arrangements are being made for the 1955 outing under the leadership of Mr. Bernard Louviere, Acting Chairman in the absence of Mr. J. E. Rebold due to illness.

The president announced that the 1955 Technical Paper Committee had held its initial meeting and that a state-wide telephone hook-up meeting similar to those held in 1953 and 1954 was planned for the month of December.

The secretary read a letter from the American Chemical Society thanking the board for its endorsement of their statement of policy regarding effective use of the nation's scientific and technical manpower.

Mr. Wallace moved that, in accordance with the constitution, the following members be dropped for non-payment of dues and that they be notified of such action: Cary J. Hodges, Byron P. Lyons, Jr., Bryce K. Tomlin, Andrew H. McDonald.

Motion was seconded by Mr. McLellan and carried.

Dr. Macdonald reported that the Woman's Auxiliary to the L.E.S. was considering a change in its requirements for membership, whereupon the board recommended that President Seago write to Mrs. M. G. Zervigon, President of the auxiliary, recommending that membership therein be restricted to wives of L.E.S. members. It also was suggested that President Seago write a letter of commendation to the auxiliary upon the establishment of the Shreveport Chapter, with copy to Mrs. E. M. Freeman, first president of the new chapter.

Dr. Taylor reported on the proposed technical information center for the New Orleans area. After some discussion it was decided that President Seago would write to Mr. John R. Tusson, thanking him for the invitation to participate in the enterprise and stating that the L.E.S. would be willing to cooperate in every way except financially due to its limited funds.

The secretary reported that a Series F bond maturing in April had been cashed and another \$1000 bond (No. M-156193-J) had been purchased in the society's name.

A quotation from the Addressograph-Multigraph Corporation on the cost of a new addressograph machine, Model 904, was read. Mr. Freeman moved that the society purchase this machine, seconded by Mr. Macdonald and carried.

Mr. McLellan moved that a letter file cabinet also be purchased, the cost not to exceed \$90.00. Motion seconded by Mr. Wallace and carried.

Dr. Macdonald informed the board of the Curtis McDaniel case, a violation of the Professional Engineering License Law now pending, whereupon it was decided to give publicity to the matter in the next issue of the Proceedings.

It was moved by Dr. Macdonald, seconded by Mr. Wallace and carried, that the following committee chairman be appointed for the 1956 Annual Meeting:

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Chris H. Hall	Contact with Woman's Auxiliary
Jerry W. Affolter	Plant Inspection
Henry L. Landry	Program
Douglas A. Donald	Publicity

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President Seago urged the board to give careful consideration to possible vice-chairmen for these committees and stated that appointments would be made at the next board meeting.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

**Minutes of Meeting of the Louisiana Engineering Society held on May 2, 1955
in the Jackson Room, St. Charles Hotel**

The meeting was called to order by President Seago, with approximately 125 members and guests present. The president welcomed those in attendance, including members, guests and JET high school students, after which he requested a motion to dispense with reading of all minutes because of the length of the meeting. Mr. Negrotto so moved, seconded by Mr. Lehmann and carried.

The secretary read a proposed amendment to the constitution regarding membership dues. There being no discussion or motion from the floor, the president inquired for any other business, after which Colonel J. T. Knight welcomed members of the JET program and gave an outline of the activities of the L.E.S. JET Committee. Mr. H. L. Lehmann then announced that he had been authorized by the Director of State Highways to say that any JET member over 18 years of age who is interested in studying civil engineering could secure summer employment with the Highway Department.

Mr. Todd then introduced the principal speaker of the evening, Mr. Grady Carlisle, Assistant Planning Engineer for the Louisiana Department of Highways, who gave a most interesting appraisal of highway needs in Louisiana.

Following the usual question period, the meeting adjourned with a rising vote of thanks to the speaker.

JOHN P. FERNANDEZ, Secretary-Treasurer

**Minutes of Meeting of the Board of Direction Held on Saturday, June 18 at
UCT Camp, Baton Rouge**

The meeting was called to order by President Seago with Messrs. Andrews, Drawe, Edwards, Poole and Fernandez present. Mr. Ted Innes, General Chairman of the 1956 Annual Meeting, also was present by invitation. Mr. Edwards moved that minutes of the preceding meeting be accepted as read, seconded by Mr. Poole and carried.

A report on the 1955 Annual Meeting, submitted by Mr. A. W. Durning, General Chairman, was read and Mr. Drawe moved that the board thank Mr. Durning and all of his committee chairmen for the excellent and efficient manner in which the meeting was handled and brought to its successful conclusion. The motion was seconded by Mr. Andrews and carried unanimously.

Mr. Innes announced that tentative plans for the 1956 meeting had been made; dates set were January 19-20-21, and place, the Delmont Motel in Baton Rouge. He said that technical exhibit space would be rented and a registration fee charged to provide extra sources of income to help defray expenses, since the dinner dance probably would not be as well attended as in previous years. He also stated that every effort would be made to have the meeting most attractive to the Woman's Auxiliary. After receiving the report and clarifying some points, Mr. Poole moved that the dates for the 1956 Annual Meeting be set for January 19-20-21 in accordance with the committee's plans. Motion seconded by Mr. Edwards and carried. Action on other items was deferred until a budget for the meeting could be supplied.

The auditor's report for the calendar year 1954 was read by the secretary.

The secretary reported that plans for the state-wide telephone meeting were proceeding but that only the Monroe, Shreveport and Lafayette Sections had signified their intention to participate. Whereupon Messrs. Poole and Edwards advised that their respective sections (Baton Rouge and Alexandria) also would take part.

Letters of appreciation from the Alexander, Stewart and Rodriguez families were read.

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The secretary read a letter from the Southern States Apprenticeship Conference in which the Management representative for the State of Louisiana requested that the society contribute to the conference. The secretary was instructed to advise that due to limited funds the society has been forced to adopt a strict policy of rendering financial support only to those endeavors aimed directly toward advancement of the engineering profession.

With the concurrence of the board, President Seago appointed the following vice-chairmen to serve on the 1956 annual meeting committees:

Roy E. Johnson	Banquet
Milton L. Levy	Plant Inspection
Wendel G. Leibe	Program
Clifton R. Newlin	Publicity
Leo Holzenthal	Registration
Daniel H. Vliet	Student Conference
Max P. Watson	Technical Papers

Mr. Drawe pointed out that, since these gentlemen are not from the Baton Rouge area, they would not be expected to take a very active part in the 1956 meeting but would be expected to serve as chairmen of their respective committees for the following year.

Mr. Poole moved that the resignation of Austin J. Mary be accepted with regret, seconded by Mr. Andrews and carried.

Mr. Edwards moved that Maitland A. Steele be reinstated to the grade of Junior Member, seconded by Mr. Drawe and carried.

President Seago stated that two important matters should receive the society's immediate attention: one, that the change in the constitution concerning dues also affects Article No. 13, Section No. 2, which should be amended to indicate the proper amount of dues rebates, namely 50% of the amount collected from members, affiliates and juniors.

The other matter concerned an omission in the Registration Act for Professional Engineers. During the recent McDaniels case the Judge pointed out that Act 73 does not explicitly empower the Board of Registration with authority to request indictment of violations.

It has been suggested that the Board of Registration be asked to prepare an amendment containing this provision that would be similar to the one contained in the medical law, and to refer it to the society's Legislative Committee to be included with the other amendments already agreed upon, to be then submitted to the Louisiana Council of Engineers for adoption before presentation to the Louisiana Legislature.

Mr. Poole moved that the president be empowered to start action to effect the necessary amendments to the L.E.S. constitution and the Engineering Registration Act. Motion seconded by Mr. Edwards and carried.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of the Alexandria Section of the Louisiana Engineering Society, May 26, 1955

Mr. Edwards, President, presiding, called the meeting to order. The minutes of the March and April meetings were read and adopted. There were fifteen members present. It was moved, seconded and voted to hold meetings on the fourth instead of the third Thursdays. Committee activity was discussed. Honorary or Life Memberships for incapacitated members was discussed. Mr. Edwards was to write the parent chapter. It was moved and seconded and passed to authorize the President to write the parent chapter agreeing to participate in a statewide telephone network hookup for the third year to be held in December with the Ladies Auxiliary assisting. It was moved, seconded and carried to join the Ladies Auxiliary in planning a reservation for our annual Christmas meeting at the Country Club. It was moved and voted that our annual picnic be held at Mr. Levy's camp at Fishville on June 25, inviting our State officials. Messrs. Levy, Melancon and Balentine were appointed as a committee for this affair. Mr. Sandefur made a very interesting talk on "The History of Alexandria, Louisiana" and presented some maps dating back before the Civil War.

As there was no further business the meeting was adjourned.

C. W. COOK, Secretary-Treasurer

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**Minutes of Meeting of the Lafayette Section, Louisiana Engineering Society,
March 8, 1955**

The March meeting of the Lafayette Section of the Louisiana Engineering Society was a dinner meeting and was held Tuesday, March 8, 1955 at 7:30 p. m. at Poor Boy's Riverside Inn.

After the dinner, the business portion of the meeting was called to order by President Russell.

President Russell called upon the guests and the students of the Southwestern Student Chapter of the Louisiana Engineering Society to introduce themselves.

After the introductory period, Mr. D. J. O'Rourke moved that we dispense with the reading of the minutes of the February meeting. The motion was seconded by Mr. W. Robert and carried.

President Russell called upon Mr. D. J. O'Rourke who reported on the results of the Engineer's Week Committee. Mr. O'Rourke reported that through Engineer's Week banners and posters were distributed, spot announcements and two fifteen minute recordings were broadcast by a local radio station, the local paper carried a full page and a half ad, and the library of Southwestern Louisiana Institute had a display depicting the importance and functions of Engineering.

President Russell appointed the following to comprise the Nomination Committee: R. E. Jenkins, W. E. Robert, and T. A. Bonnett.

President Russell announced that the section should have a representative in the Chamber of Commerce and that the section pay the dues. Mr. J. R. Gaugler moved that the president of the section be appointed as representative of the section. The motion was seconded by Mr. L. C. Landry and carried.

The chair was turned over to Mr. R. E. Jenkins who introduced Otto Prohascha, President of the Student Chapter of the Louisiana Engineering Society at Southwestern Louisiana Institute. Mr. Prohascha reported on the functions of the Student Chapter.

Mr. Prohascha introduced the guest speaker of the evening, Mr. Carol Oubre, a student and member of the Student Chapter of the Louisiana Engineering Society at Southwestern Louisiana Institute. Mr. Oubre gave an informative and interesting talk pertaining to "The Metal Titanium". President Russell presented Mr. Oubre with a gift on behalf of the Lafayette Section and the Student Chapter of the Louisiana Engineering Society.

Mr. F. Consterdine moved that the next meeting be a dinner meeting. The motion was seconded by Mr. E. E. Guillot and carried.

Mr. F. Larue moved that the meeting be adjourned. The motion was seconded by Mr. L. C. Landry and carried.

ALFRED W. SCHOEFFLER, Secretary-Treasurer

**Minutes of Meeting of the Lafayette Section, Louisiana Engineering Society,
April 12, 1955**

The April meeting of the Lafayette Section of the Louisiana Engineering Society was a dinner meeting and was held Tuesday, April 12 at 7:30 p.m. at Poor Boy's Riverside Inn.

After the dinner, the business meeting was called to order by President Russell.

President Russell called upon the guests and new members to introduce themselves.

After the introductory period, the chair was turned over to Mr. F. L. Larue who introduced Dr. P. A. Chierl as guest speaker of the evening. Dr. Chierl gave an interesting talk titled, "Jet Propulsion and Rockets".

After a lively question and answer period the meeting was adjourned with a rising vote of thanks for the guest speaker.

ALFRED W. SCHOEFFLER, Secretary-Treasurer

Note: Due to the absence of the Secretary-Treasurer the minutes were recorded by R. M. Hetherwick.

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Mr. F. Larue moved that the meeting be adjourned. The motion was seconded by Mr. L. C. Landry and carried.

ALFRED W. SCHOEFFLER, Secretary-Treasurer

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ALFRED W. SCHOEFFLER, Secretary-Treasurer

Note: Due to the absence of the Secretary-Treasurer the minutes were recorded by R. M. Hetherwick.

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**Minutes of Meeting of the Lafayette Section, Louisiana Engineering Society,
May 10, 1955**

The May meeting of the Lafayette Section of the Louisiana Engineering Society was "Ladies Night". The meeting was held at Poor Boy's Riverside Inn at 7:30 p. m. Tuesday, May 10, 1955.

The meeting was begun with a supper, after which the business portion of the meeting was called to order by President Russell.

Mr. D. J. O'Rourke moved that we dispense with the reading of the minutes of the April meeting. The motion was seconded by Mr. J. E. Jarman and carried.

President Russell called for the reading of the Treasurer's Report. Mr. D. J. O'Rourke moved that we dispense with the reading of the treasurer's report. The motion was seconded by Mr. H. R. Mason and carried.

President Russell called upon the guests to introduce themselves.

After the introductory period, Mr. O'Rourke moved that the section have a "crayfish boil". The motion was seconded by Mr. A. E. Faulk and carried. President Russell proposed that the time and place be determined by the newly elected executive committee.

President Russell announced the proposed plan of the telephone hook-up between the state sections.

Mr. E. Loflin moved that the Lafayette Section participate in the state-wide telephone hook-up of the local sections. The motion was seconded by Mr. O'Rourke and carried.

President Russell called upon Mr. A. T. Bonnet to report upon the findings of the nomination committee. Mr. Bonnet reported the following as nominees for office for the ensuing year:

Mr. Z. L. Loflin, President; Mr. R. M. Hetherwick, 1st Vice President; Mr. W. J. Johnson, 2nd Vice President; Mr. Warren Hollier, Secretary-Treasurer.

Mr. R. Hetherwick requested that his name be omitted, since he would not be able to attend the meetings which are held on the second Tuesday of each month. Mr. Bonnet moved that the monthly meetings of the section be changed to another night. The motion was seconded by Mr. A. Bujard and carried.

The chair was turned over to Mr. Z. Loflin who introduced the first guest speaker of the evening, Mrs. F. W. Macdonald, president of the Ladies' Auxiliary of the Louisiana Engineering Society. Mrs. Macdonald discussed the objects and aims of the Ladies' Auxiliary.

After Mrs. Macdonald's talk, Mr. Loflin introduced the second speaker of the evening, Mr. F. W. Macdonald, recent past president of the Louisiana Engineering Society. Mr. Macdonald gave a talk pertaining to "Engineering Registration".

After a lively question and answer period, the chair was resumed by Mr. Loflin. Mr. Loflin thanked the guest speakers on behalf of the section.

The chair was turned over to President Russell. President Russell called upon Mr. A. T. Bonnet who in turn presented Messrs. C. A. Bell, G. G. Hughes, J. O. Herpin, and S. W. Elberson with mementos of their recent retirement from fields of Engineering.

Retiring President Russell turned the meeting over to President-Elect Loflin who adjourned the meeting with a rising vote of thanks to the retiring president.

ALFRED W. SCHOEFLER, Secretary-Treasurer



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The U. S. Civil Service Commission, Washington, D. C., has announced examinations for filling two positions for engineers.

The first is for Laboratory Electronic Mechanics in various Government Laboratories in Washington, D. C. and vicinity. The positions pay from \$2,950 to \$5,940 a year.

No written test is required. To qualify, applicants must have had experience in the operation and repair of laboratory electronic apparatus. Pertinent education may be substituted for part of the required experience. Applications must be filed with the Board of U.S. Civil Service Examiners, National Bureau of Standards, Washington 25, D. C.

The second examination is for engineers for filling positions paying \$4,345 and \$9,930 a year at the McClellan Air Force Base, McClellan, Calif. Optional branches of engineering included in the examination are aeronautical, electrical, electronic, industrial, materials and mechanical.

To qualify, applicants must show appropriate education or experience or a combination of such education and experience. No written test is required. Applications must be filed with the Board of U.S. Civil Service Examiners, McClellan Air Force Base, McClellan, Calif.

Further information and application forms for the examinations may be obtained from many post offices throughout the country or from the U.S. Civil Service Commission, Washington 25, D. C.

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PROCEEDINGS OF THE LOUISIANA ENGINEERING SOCIETY

Vol. 41

DECEMBER, 1955

No. 4

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OUR ANNUAL MEETING

For the first time in the Society's history our annual meeting will be held outside of New Orleans. The Baton Rouge section will be our hosts when the 1956 meeting convenes at the Bellemont Hotel in Baton Rouge on January 19 - 20 - 21. A very pleasant and interesting week-end is promised to those who attend.

All of the technical sessions will evolve from a central theme a 20-year forecast of the future of Louisiana and the role of engineers in furthering the development of our state. Here are some of the topics to be discussed by an impressive list of speakers: Natural Resources, Economics, Industry, City Planning, Education, Construction, Agriculture.

Recreational features will include industrial plant tours, a banquet on Friday and the usual cocktail hour, buffet supper and dance on Saturday evening. The Woman's Auxiliary has planned several enjoyable events for the ladies, so be sure to bring the "Mrs." along.

Let's all meet in Baton Rouge in January!

IMPORTANT NOTICE

The headquarters of the Louisiana Engineering Society has been moved to the Hotel De Soto. Please address all correspondence to:

Louisiana Engineering Society
Hotel De Soto
New Orleans 12, La.

SURFACE WATER OF LOUISIANA AND OF THE UNITED STATES*

by F. N. Hansen, District Engineer
U. S. Geological Survey
Baton Rouge, La.

Introduction

If each of you engineers were asked the question, what is water?, you would probably reply somewhat as follows: Water is a clear, tasteless, odorless liquid that becomes gaseous at 212°F and solidifies at 32°F. It is practically incompressible although it is the compound of two gases, hydrogen and oxygen. It weighs about 8½ pounds to the gallon, which gives substance to the statement, "A pint's a pound the world around." It is the criterion for the density of all other materials. It is one of the greatest solvents known to men. Many questioners would be satisfied with that information or less.

Because many engineers are associated with water problems in their daily work, they are aware of, and would wish to stress, many of the more essential qualities of water even at the risk of being verbose. It is one of our most valuable natural resources. It is required for sustenance of all life and man could not last long without it. Water for drinking, for sanitation, and for preparation of foods is an every day domestic requirement.

If pollution should enter the community water-supply undetected, there are not enough doctors in any community to save us from serious epidemics. Water is the cheapest method of transportation. It is used for power, irrigation and recreation. However, water can also be destructive. When great floods strike, the terror engendered is probably second only to that created by fire.

Nature has provided the power plant in the sun and wind that daily transports tons of water over the lands from the oceans. Water falls upon the lands to flow again to the sea in a never ending cycle — the hydrologic cycle — known to most of you. The supply may vary from year to year and season to season, yet over long periods the overall supply remains reasonably constant. Because of the great disparity in distribution of rainfall, we continue to search for an economical means to produce fresh water to aid many regions of our country that lack only water for development.

Water Uses

The value of water increases with demand just as any other commodity. Man's need for water in the primitive state was about a gallon per day per person. Man's progress in this country, as we

*Publication authorized by the Director, U. S. Geological Survey.

measure progress, is reflected in the tremendous increases in his requirements for water. The per-capita use now in the United States can only be guessed owing to the lack of reliable data, but it may approach or even exceed 1,000 gallons per day. These estimates (McGuinness, 1951, p. 81) exclude use for hydroelectric power generation, navigation, and recreation. This gives some idea of the magnitude of present demands. Our industrial and domestic demands for water have exceeded all expectations and continue to go up as the economy expands.

The demand for water by agriculture and industry is tremendous. According to estimates prepared by the U. S. Geological Survey for the President's Water Resources Policy Commission (*A Water Policy for the American People*, 1950, Vol. 1, p. 177), the use of water for irrigation in the United States is now about 95 billion gallons per day and industrial uses require about 70 billion gallons per day. Municipal and rural domestic requirements are less than 10 per cent of the combined needs for irrigation and industry.

The total for domestic, municipal, industrial and agricultural use of water is of the order of 160 to 200 billion gallons per day which is roughly 12 to 15 per cent of the total flow of streams to the ocean. A comparison of this total water use to available Louisiana stream flow places this State in a very favorable position for on the average 450 billion gallons of water per day flow from Louisiana surfaces into the Gulf of Mexico. This is two to three times estimated country-wide requirements. Comparisons of this nature merely tend to indicate the potential of the country and State. Full development of the potential in all probability cannot be achieved.

A few figures on requirements for modern industry indicates that water is a raw material of vital consequence. Each pound of butadiene requires 160 gallons of water for its manufacture, and 600,000 gallons of water are needed to make a ton of synthetic rubber. Sulfite pulping takes 60,000 gallons of water per ton of product. Soda-pulp bleaching requires more than 80,000 gallons per ton. Oil refineries use 770 gallons of water per 42-gallon barrel of oil in some processes (Paulsen, 1950).

The national need will continue to trend upward at an accelerated pace. The harnessing of atomic energy and air conditioning are only two late comers that require large quantities of water and bid fair to expand at a tremendous rate.

In 1950, industrial and municipal water uses in the State were in the following order of magnitude: municipal, 100 million gallons per day; and industrial, 1,600 million gallons per day. The State Department of Public Works and the Geological Survey are now

conducting a further survey of water use in the State, which is being carried out at the request of the Louisiana Legislative Council. A report is to be made to the Council early next year.

There is greater development of water supplies in southwestern Louisiana than in any other part of the State. That area is one of the most ideally suited in the Nation for rice culture. For this reason, there has been extensive development of surface-water supplies for rice irrigation. As the pumping plants are dependent on "run of the river" flow, the supply will not meet the demand in abnormally dry years.

A report on the water resources of southwestern Louisiana completed in 1954 by U. S. Geological Survey engineers, geologists, and chemists documented one of the most comprehensive studies made of an area of comparable size and importance in the United States. To date only the ground-water phase of the report has been published (Jones, Turcan, and Skibitzke, 1954), but the complete work is scheduled for early publication as a water-supply paper (Jones, Hendricks, and Irelan, 1955, in press). This investigation was particularly directed toward the problem of the occasional economic upset of nearly 20 per cent of the State's region and peoples engaged in one of the State's most valuable enterprises—the more than 50-million-dollar annual rice industry.

The surface-water phase of that investigation, carried on in cooperation with the Louisiana Department of Public Works, disclosed a number of facts that may be of interest here. In connection with the investigation it was determined that the average seasonal water requirement for growing rice amounts to about 32 inches. If rains in this amount occurred seasonally and could be retained as needed on the fields, there would be no need for irrigation. The spacing and intensity of rains greatly control their usefulness. However, it was determined that generally about 75 per cent of the rain occurring during submergence of the ricefields can be captured for beneficial use.

Water that is not available from rain must be made up by irrigation. Deficiencies in rainfall are felt both at the field and at the supply stream. That is, less rain means less streamflow and at the same time provokingly creates a greater demand for water from the streams. If surface water were supplied at the field (the general case with ground-water), the total seasonal requirement would average about 32 inches minus the effective rainfall. Presumably this would be only slightly less in wet years and slightly more in dry years as evapotranspiration potential would vary in such manner. However, in transporting water from the supply streams, losses take place in the transportation and again drought

severity tends to sow seeds of aggravation as losses amount to about 35 per cent of the diversion. The greater the diversion the greater the transportation loss.

From the data collected it was deduced that in a year of severest drought or a year of maximum probable diversion, the total need for irrigation water at the supply stream might be 3.5 acre-feet per acre for the season. In a wet year requirements may drop to less than 2 acre-feet per acre for the season at the point of diversion. During the period 1949-51 the average seasonal depth of water applied to the fields was about 22 inches and the average diversions from the streams for the same period amounted to about 34 inches.

Farmers irrigating with surface water usually pay one-fifth of the crop as water rent regardless of the amount of water used. Farmers irrigating with ground water usually own their pumps. This difference in operating methods has no doubt helped to foster the prevalent opinion that farmers irrigating with surface waters are less conservative in the use of water than farmers irrigating with ground water. The investigation revealed no significant difference in water use between ground- and surface-water irrigators.

Water Inventory

Every well-run business has a book record of its assets. Water occurring in streams, lakes, and underground reservoirs is an asset on the credit side of the country's ledger. We can neither control nor utilize water resources in the most efficient and economic manner unless the credit balance is known. Water is a renewable resource and should be utilized fully and to best advantage.

The U. S. Geological Survey has been authorized by the national Congress to inventory and evaluate the water resources of the country. Congress, however, recognized that this task was not wholly a Federal responsibility. Therefore, the Survey is further authorized to enter into cost-sharing agreements with States, countries, municipalities, and other political subdivisions in making this inventory. The Survey is now performing the work on a cooperative basis in every State in the Union. This inventory has been extended into every outlying possession.

The work of the Survey is solely that of fact-finding. It is a grass-roots endeavor and the Survey has from time to time enlisted the aid of individuals in every walk of life in order to obtain insofar as possible information on our water resources.

Stream-gaging and streamflow analysis is a highly specialized science. Rivers and streams are measured by engineers with specialized equipment for soundings and velocity observations. Measured flows are related to gages that operate day and night to

record all fluctuations in the water surface of the streams. Flows measured under different heights of water in the streams can be related and thereby a continuous record of flow can be obtained upon analysis.

An experienced engineer can, when conditions are favorable, measure the flow of a stream within two per cent of that actually passing downstream at the time of measurement. The Survey's velocity meter, known as a small Price current meter, will give results that compare favorably with all other known methods of flow determination. Wood (1944) gives several examples in his interesting paper. Although the Survey's basic instrument for measuring the flow of streams is the small Price current meter, the Survey has used from time to time all other known measuring devices and methods, such as weirs, flumes, pipes, pitotmeters, static stick, the volumetric and trajectory method, and indirect method such as slope-area and contracted-opening, and other devices and methods. Considerable work has been done by the Survey on determining flow through bridges and culverts. Some of these methods are still under investigation by the Survey under controlled laboratory conditions.

Water Data and the Engineer

Man has constantly endeavored to decrease or eliminate the losses that may be suffered during times of severe floods or droughts. Any effort made by man to control or utilize a stream or river is engendered because of economic considerations. Ineffectual or unsound methods of control and utilization can be unnecessarily costly to an individual, a group of individuals, or an entire nation. The size of a stream or river generally determines whether control and utilization are undertaken by an individual, a corporation or association, a municipality, or State or Federal government. As streams grow in size so, too, grow the political, social, economic, and hydrologic complexities affecting wise development.

In the visitation of floods and droughts, events that have occurred in the past may confidently be expected to occur again in the future. There is considerable evidence that the magnitude and frequency of floods and droughts follow a pattern capable of analysis by statistical methods. Although these methods do not make it possible to predict the exact time of occurrence of a particular hydrologic event, they do make it possible to provide a means of determining the average interval of time between occurrences of similar magnitude.

Knowledge and evaluation of the magnitude and frequency of floods are necessary to the proper design and location of structures placed in, across, or adjacent to streams. Dams, levees, or like

structures that may cause loss of life in the event of failure should be designed to withstand a flood of maximum probable magnitude. However, structures of lesser importance where failure would not ordinarily be so disastrous can be designed for much lesser floods usually at considerable savings. Consequently, in such cases a design that takes into account flood expectancy of practical magnitude rather than the maximum probable flood is more realistic in its approach. The estimated damage resulting from the occurrence of the design flood, coupled with the probable useful life of the structure, should be weighed against the additional costs of designing the structure to prevent such damage.

The need for systematic streamflow records has been recognized by engineers in the State Department of Public Works who have supported a program in cooperation with the U. S. Geological Survey since 1942. Engineers in the State Department of Highways have recognized the economic import of flood data and since 1948 have supported a program which supplements that carried on with the Department of Public Works.

The concept of design of structures with respect to flood frequency is recognized by engineers with the Louisiana State Department of Highways who in recent years have based design of bridge openings on a probable flood of practical expectancy. To aid in the design of waterway openings, the Department of Highways has published a cooperative report, prepared by Geological Survey engineers, that contains much flood data on Louisiana streams and a section on frequency of floods (Cragwall, 1952, pp. 229-273).

Engineers quite frequently plan and place dependence on "run of the river" flow to meet demands. Many of the streams in northern Louisiana have poorly-sustained low flows. Such streams carry mostly surface or overland flow, and rapid recession or dropping off in flow takes place following rainfall. Flow in such streams diminishes at the rate that surface channels drain. Many of the streams in southwestern Louisiana have well-sustained low flows fed from ground-water supplies during long periods of dry weather. Well-sustained low-flow characteristics reflect storage within the basin that might in some cases be surface storage in lakes, ponds, or swamps. Most streams in the "Florida" parishes have well-sustained low flows.

A duration curve shows the percentage of time that a specified daily discharge has been equaled or exceeded. It may be considered a probability curve and used to estimate the probability of occurrence of a specified discharge. A duration curve does not give the number of continuous days that specified flow cannot be met within a stated time interval of say one or more years. (Foster, 1934, pp. 1213-1235).

Current information on streamflow has been used successfully by many industries in order to regulate effluent flows into the streams in the amounts and at the times when effluent discharges will not have deleterious effect and will meet the dilution requirements set up by the interested State agency. Pollution has not become a real problem in Louisiana. Plant effluents of a toxic nature are permitted into the streams as long as dilutions resulting in the stream meet established standards.

The source of all waters, whether found in underground reservoirs or in surface streams, is rainfall. Considering the importance of rainfall to mankind, Providence has been kind to Louisiana. Louisiana's average rainfall is nearly twice that for the Nation as a whole. It varies in Louisiana from about 46 inches in the northwest to 64 inches in the southeast. All the water that falls on the land surface does not reach the streams or seep into the ground to return to the streams again. Considerable amounts are returned to the atmosphere through evaporation and transpiration. Runoff in a stream is the residual that remains after evaporation and transpiration demands are met.

In some regions of the United States, particularly in mountainous and arid areas, runoff may vary radically within short distances. Runoff is subject to variation by many natural influences, some of which are climate, geology, topography, and vegetation (Langbein, 1949, p. 12). Available flow records indicate no radical variations in the runoff from Louisiana's streams. Runoff in Louisiana varies from about 16 inches in the northwest to a high center of 26 inches in Evangeline Parish and 24 inches in the southeast.

Summary

1. Water, a renewable resource, is one of the most valuable natural resources necessary to man's development and well-being.
2. The abundance or lack of water within an area or region dictates the extent of development that can take place.
3. Modern civilization and the American standard of living continually demands greater amounts of water and may exceed 1,000 gallons per day per capita as compared to a per capita primitive-state requirement of about one gallon per day.
4. Louisiana has a greater abundance of water resources than any other State in the country.
5. Even in Louisiana some localized problem areas exist and wise development of our water resources is a must.

6. Development based on knowledge of available supply can save capital investment.

7. Stream gaging is the one method of determining supply and in view of relative low cost no substitute for stream-gaging data is warranted.

8. That which has happened in the past will recur with reasonable certainty and streamflow data lend themselves to statistical analysis.

9. The sound approach to the engineering solution of water problems is through the use of all available basic data.

10. The engineering approach to the solution of water problems is one based on available facts rather than the blind use of formulary computations.

NUCLEAR NEWS

Nuclear Reactor Simulators to be Marketed for Training. Engineers soon may be learning how to operate nuclear energy reactors, not on actual units but on simulators that faithfully imitate behavior of the real thing. One such product now is being marketed commercially for training and research.

With the swing toward large-scale use of nuclear power, a whole new generation of operating men, schooled in fission process and control, will be needed. Since costly reactors are not readily available for instructional purposes, one answer to the training problem is the less expensive simulators, which respond like actual units in producing, maintaining and controlling nuclear chain reactions.

One device, believed by its manufacturers to be the first commercial nuclear reactor simulator, features an electronic "brain." When the trainee manipulates the controls, the "brain" instantly figures out how a particular real reactor would respond and sends signals to the instruments and control gear. At the same time the trainee can see the action of working control rods in a dummy fuel core. The electronic brain can be adjusted to imitate a variety of actual reactor types and can be set to simulate emergency conditions or accidents.—*Power*.

* * *

Matrimony Popular. To eliminate any possible genetic effects from radiation, a Canadian atomic plant forbids married couples from working at the plant. However, an official at the plant admits that "it's difficult to prevent single people who meet on the job from marrying each other."—*Chemical Week*.

* * *

Atomic Power In Britain. Nuclear power plants in Britain are expected to match production costs of coal-burning plants by 1961. Atomic plants are expected to produce ten to 15 kw by 1975 to save 40 million tons of coal per year.—*Electrical World*.

* * *

Thirst-Quenchers. Thirst-quenching tank trucks recently held all the water used for drinking and cooking by a Michigan community of 1800. For four days the town of Utica was kept from drawing water from its usual source, the nearby Clinton River, because poisonous chromium wastes dumped in the river upstream made the water unfit for use. Three fleet operators supplied four

tank trunks as stationary storage units at points about the town and a fire truck transferred a total of 16,000 gallons of pure water from a safe water supply to the thirsty citizens.—*Fleet Owner*.

* * *

New Uranium Site. Geological studies conducted since 1953 in the Pribram region of Czechoslovakia are reported to have proved the existence of uranium deposits, estimated to permit 30-year operations. With mining activities rapidly increasing, the number of workers has risen from 400 in 1954 to 1,100 at present. The team of Soviet experts is guarded by 150 Czech militia men.—*Engineering and Mining Journal*

GOOD IDEAS

Loudspeakers Ease Communications Job On Large Scale Construction Projects. Loudspeaker systems, connecting the offices of construction companies with workers on the erection site, have solved the problem of communication between the man in the office and the worker on the girder.

At the New York Coliseum, for example, a well-planned loudspeaker system, which mushrooms as the job progresses, enables an operator at a central telephone switchboard to page to a near-by telephone any worker on the project. To contact his floor foreman, for instance, the office man picks up a phone and calls the job number—the operator pages the foreman to the nearest phone (located on every other floor), and in a few minutes the supervisor has his instructions.

According to the chairman of the operating committee for the joint-venture contractors working on the Coliseum, the loudspeaker system 'not only provides excellent contact between the front offices and the job, but it also expedites the flow of materials.' When a truckload of materials arrives at the project, the operator can announce what it is and where it is located—an extremely valuable aid, it is pointed out, in a job the size of the Coliseum.

The loudspeakers at the project are placed as soon as the steel is erected. At present, there are 128 speakers on the project from the foundation to the top floor. The speakers and their installation are estimated to cost between \$7,000 and \$9,000.—*Construction Methods and Equipment.*

* * *

Eight Hydraulic Jacks Close Japan's Longest Steel Bridge. The closing of Japan's longest steel arch span has recently been effected in a unique way, through the use of eight 300-ton capacity hydraulic jacks.

The jacks enabled the erection of trusses to be transformed smoothly and easily into the stress condition of the fixed arch. They also improved conditions of stress distribution through the arch by permitting the application of pressures to eliminate the tension on the upper chords.

The removal of erection stresses by this method was first tried on the Rainbow Bridge at Niagara Falls, but the correction of stress distribution in this manner is thought to be an original attempt.

The span, a highway bridge over Inoura Narrows at the mouth of Omura Bay in the northwest of Kymushu Island, is intended to speed traffic traveling between Nagasaki and Sasebo. The center

span is 800 feet long and is supported by the braced fixed arch. Total length of the bridge is 1,048 feet. Rise is approximately 113 feet.—*Engineering News Record*.

* * *

Flowering Stockpiles. Ore stockpiles are not likely candidates for garden club awards. But many may soon be sporting mantles of flowering vegetation if other companies adopt the erosion-curb-ing system recently discovered by one chemical concern. When a load of chrome ore which turned up from South Africa containing seeds of corn and castor beans began to sprout, it was discovered that overgrown piles no longer washed away as did uncovered piles, during heavy rains. The company then investigated other gasses and vegetation. Most effective: the hardy morning glory.—*Chemical Week*.

ENGINEERING BRIEFS

Automobile Statistics. Sixty-one million registered motor vehicles and 72 million licensed drivers in the United States today are piling up mileage at the unprecedented rate of more than 560 billion miles a year, the Automobile Manufacturers Association reports.

This is an average of approximately 9,200 miles per vehicle and 7,800 miles per driver.

The AMA, in its annual statistical handbook, *Automobile Facts and Figures*, reported the following highway facts;

1. Motor vehicle registrations and travel mileage on the nation's highways are due to increase more than 33 per cent by 1965.

2. Inadequate roads today are costing U.S. motorists more than \$5 billion per year.

3. To correct road inadequacies, \$101 billion will be needed for highway construction during the next 10 years.

4. Half of the anticipated traffic growth in the coming decade will be on the 40,000-mile Interstate Highway System.

5. Highway construction and maintenance costs per mile have doubled since 1941.

* * *

New Material for Expander Rings in Jet Engines. Oil seals for main shafts on some jet engines ask a lot of their expander rings. One design calls for a ring that keeps its temper and ability to sustain load with a relaxation not to exceed 15 per cent of 1000 degrees Fahrenheit. The manufacturer finally found a material for the job—Inconel "X" age hardenable nickel-chromium alloy. This alloy has excellent high temperature strength and corrosion resistance. Good spring properties, too.—*Mechanical Topics*.

* * *

General Electric Introduces New 30/200 Watt Lamp Bulb. General Electric placed on the market recently a new idea in a two-filament lamp bulb, utilizing the combination of a 200-watt filament and a 30-watt filament in the same unit.

The new product answers a need for a combination reading lamp which can also be used as a television light.

According to E. D. Stryker, GE executive, there has been a gradual trend in the residential market toward a greater use of 50/100/150-watt medium base bulbs, and a greater number are in use in homes than the number of 100/200/300-watt bulbs with their Mogul base. "In most applications, the maximum wattage is re-

quired for the application," he reported. "When either filament burns out, the remaining output is too low for the application, and equally important—too high to use as a night or a TV light."

GE's new 30/200-watt bulb has a Q coat diffusing finish, and the 200-watt element will provide a better utilitarian light and is rated to last 1,000 hours.

* * *

Ownership of TV's Skyrockets. The Census Bureau reported that 32 million U.S. families have television sets, compared with only five million in 1950.

Four out of five families in cities have them, the bureau said, but less than half the rural homes have them.

* * *

Faster Automatic Computers. Automatic computing speed can now be even faster, reports Product Engineering magazine, since scientists in the computer lab of the National Bureau of Standards have now packed up to 700 digital pulses per inch on magnetic tape, as opposed to 200-300 pulses per inch on old computers.

* * *

Latex Aids Fabrics. A latex-compound is being used by a Kentucky textile firm on many of its styles of upholstery fabrics to make them lie better in the cutting room, ravel less after cutting and be more stable after they have been made up. The latex colution is a synthetic material supplied in 35 per cent concentration; only other ingridient in the coating formula is a gum.—*Textile World*.

* * *

Lightweight Equipment Pays Off. The use of lightweight drilling equipment enabled a contractor to get a highway knifing job through central Wyoming with a bid of \$60,000 lower than the next nearest bidder. The method of drilling rock with lightweight jackhammers and carbide tipped drill steel is becoming increasingly popular, and is said to result in higher output, a saving in wages, initial costs, compressed-air consumption and rock-drill upkeep.—*Construction Methods and Equipment*.

* * *

Safer With Atoms. Hazards to operating personnel of an atomic plant may well be less than those present in conversational power plants. Extra-careful control of safety in atomic installations is the reason.—*Electrical World*.

* * *

Consulting Engineer Work Rises 30 per Cent In 1954. Dollar volume of design work on heavy construction engineering projects was up 30 per cent in 1954 over the previous year, according

to a survey just completed. At the same time, the number of consulting engineer firms taking on new jobs totaling \$100,000 or more increased five per cent during the year.

Sparking the big increase in design work last year were highways, bridges, and earthwork and waterways. New highway design work represented 164 per cent more dollar volume than in 1953, while bridge design work rose 30 per cent and earthwork and waterway volume rocketed by 86 per cent over last year.

Waterworks dollar volume increased five per cent, industrial building three per cent, and airport design work one per cent last year, while unclassified construction work increased eight per cent in dollar volume. However, dollar volume was off in some fields; sewerage jobs dropped 24 per cent, non-industrial buildings (commercial, private housing and public) dropped 16 per cent, and federal work handled by consultants dropped 42 per cent below the 1953 level.—*Engineering News Record*.

* * *

Interference Problems. One unwelcome result of the industrial trend towards automation—radio interference caused by complex electrical gear used in many new machine tools and other industrial equipment—is a cause of concern to the Navy's Bureau of Ships and Army and Air Force agencies. Interference in some cases is strong enough to disable communications, interfere with radar, and confuse radio-control devices on guided missiles.—*American Machinist*.

* * *

Older Workers Welcome. Cleveland metalworking firms are letting down the age barrier for skilled workers. Hiring policies currently are extending up to 60 years of age.—*American Machinist*.

* * *

New Paper Developed. A New York paper company has a new paper which is very resistant to oil, water and other liquids, but through which air passes freely—and, now that it has been developed, some use must be found for it. Suggestions include cooler disposable rain-coats or popcorn bags that won't leak grease.—*American Machinist*.

* * *

Talking To Outer Space. Use of new knowledge gained from satellite experiments—which will throw more light on radio propagation methods already utilizing upper-air particles—should make reliable communications with the satellite in outerspace commonplace within ten years.—*Electronics*.

NEWS FROM THE SCHOOLS

LOUISIANA POLYTECHNIC INSTITUTE

More Engineering Space at Tech. The new \$1,500,000 Science Building at Louisiana Polytechnic Institute is now under construction. The contract for construction was awarded to G. E. Bass of Jackson, Miss. The building will be located along Adams Boulevard across from the Engineering Building and will house the departments of Chemistry, Botany, Physics, Zoology and Home Economics. This will release some 6,000 sq. ft. (three offices, six classroom, and storage spaces) in the Engineering Building, which are at present being used by the School of Business Administration and the Department of Physics.

The School of Engineering obtained other badly needed space this fall by the acquisition of a temporary building, now called the Engineering Annex which is located across Arizona Avenue from the Engineering Building. In this building are housed four classrooms, one office and laboratories for illumination, chemical engineering instrumentation, industrial electronics, communications, sanitary engineering and water supply, mechanical engineering research and chemical engineering research.

Instrumentation Conference. The fourth annual Instrumentation Conference was held at Louisiana Polytechnic Institute, Ruston, on Nov. 2, 3, and 4. Due to the nature of the papers presented, many different companies from many diverse industries were represented. Nearly 60 different companies were represented by some 150 engineers, vendors, technicians, management personnel and others.

Additions To the Faculty. The School of Engineering at LPI announced the following additions to the faculty effective in the fall of 1955:

Mr. David L. Johnson, Professor and Head, Electrical Engineering Department; Mr. George F. Lomax Jr.; Assistant Professor of Mechanical Engineering; Mr. C. R. Rostron, Assistant Professor of Civil Engineering; Mr. James T. Coleman, Assistant Professor of Electrical Engineering; Mr. William A. Kraus, Assistant Professor of Petroleum Engineering; Miss Marion I. Whitney, Associate Professor of Geology; Mr. Francis C. Roy, Assistant Professor of Mechanical Engineering; Mr. H. L. Henry, Associate Professor of Mechanical Engineering; Mr. E. L. Dunning, Associate Professor of Mechanical Engineering; Mr. William R. Higgs, Assistant Professor of Geology; Mr. J. T. Painter, Assistant Professor of Civil

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Engineering; Mr. Richard M. Steere, Associate Professor of Electrical Engineering, and Mr. C. O. Bundrant, Assistant Professor in the Department of Petroleum and Geological Engineering

* * *

TULANE UNIVERSITY

Engineering Educators' Meeting. Tulane University will be host to engineering educators from ten southeastern states at the 1956 annual meeting of the Southeastern Section, American Society for Engineering Education on April 5 and 6, 1956. All engineers are cordially invited to attend the sessions and to participate in the functions.

Two evening courses of interest to engineers, contractors, and business executives concerned with the production of petroleum are being planned for the Spring semester. The subjects are oceanography, with particular reference to off-shore drilling, and reservoir engineering. It is hoped that the details of these courses can be announced late in December. They will be offered in the University College of Tulane in cooperation with the School of Engineering.

Mr. George W. Webb will join the faculty of the Department of Electrical Engineering in January, 1956. Mr. Webb is currently with the General Electric Company in Pittsfield, Massachusetts. He is a native of Alabama and holds degrees from the University of Alabama and Columbia University. He has taught at the University of Alabama and was employed as an engineer in the Research and Development Laboratory at Ft. Belvoir, Virginia, before joining General Electric. He has also served in the Corps of Engineers, U. S. Army. He is a member of A.I.E.E. and of Tau Beta Pi.

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OBITUARY OF HERBERT M. SHILSTONE

The Louisiana Engineering Society has lost a valued member of many years standing by the death, on September 1, 1955, of Herbert M. Shilstone who had been in failing health for the past year.

Herbert M. Shilstone was born on the Island of Barbados, British Indies, on April 16, 1881 and received his early education in the schools of Barbados. He left the island at about the age of seventeen, going first to New York where he was engaged in Chemical Laboratory work, leaving shortly thereafter for the Middle West where he entered the mining industry as an assayer. After a period of time there he traveled south to Louisiana because of the sugar industry in this area and his considerable knowledge of sugar and sugar chemistry. He was engaged for some time as sugar chemist in various sugar mills in this state.

In 1900 he opened a commercial laboratory in New Orleans under the name of Herbert M. Shilstone, Analytical and Consulting Chemist and Assayer. During this period he became Chief Chemist for Penick & Ford at the syrup and molasses plant in New Orleans. In 1910 he changed the name of his company from Herbert M. Silstone to Shilstone Testing Laboratory, and while still operating his own laboratory he attended Tulane University College of Medicine from which he received in 1914, a degree of Doctor of Public Health. Following this he was a Professor in the College of Medicine, teaching public health, sanitation and bacteriology. He had, in 1908, taken a course of advanced study in sugar chemistry at the University of Gottingen in Germany.

During the first World War he developed a method for the manufacture of a decolorizing carbon from rice hulls for use in sugar refining. He patented this product under the name of "Carbrox" which has since been recognized as an outstanding decolorizing carbon. Dr. Shilstone was considered an authority in the sugar industry throughout the South and the tropics, and was a consultant to many refineries in design and operation of their plants.

In about 1923 he became interested in the testing and scientific control of concrete and other building materials and was considered a pioneer in this field. In 1930 he opened a branch office in Houston, Texas, and later on in other Texas cities and in Baton Rouge, La.

In 1940 Dr. Shilstone retired from active participation in his business, turning it over to two of his sons, but he later re-entered practice while they were in the armed forces. In 1945 he retired permanently.

After his retirement he found interest in ceramics as a hobby, and carried it on to the development of special glazes and clays of his own, forming a company which he called "Shilstone Ceramics", and he took a course in ceramics at a college in Southern California in the summer of 1953.

Herbert Shilstone was a member of many professional associations and societies, among which were American Society for Testing Materials, American Chemical Society, American Concrete Institute, Association of Consulting Chemists and Chemical Engineers, and others.

He is survived by his widow, the former Cecile Henrietta James whom he married in 1908, and by three sons, Herbert M. Jr., Cicil M. and James M.

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

John L. Porter
Harold A. Levy

ENGINEERS through the years...

WE are a nation of builders. Our search for new and better ways of doing things is endless, which is the fountainhead of our greatness. No wonder engineering is one of our most admired and respected professions.

WE salute Louisiana's society of engineers and wish them every success in building a better Louisiana, a job we take pride in doing, too.



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NEW ORLEANS

MINUTES OF THE MEETINGS AND BUSINESS OF THE SOCIETY

Minutes of Meeting of the Board of Direction, August 1, 1955

The meeting was called to order by President Seago with Messrs. Andrews, Drawe, Edwards, Freeman, McLellan, Nelson, Taylor, Wallace and Fernandez present. Mr. Andrews moved that minutes of the preceding meeting be accepted as read, seconded by Mr. McLellan and carried.

President Seago announced that the attorney for the State Board of Registration for Professional Engineers and Land Surveyors was very busy with the sugar industry strike, but that the wording of the amendment to Act 73 empowering the Board of Registration with authority to request the indictment of violators would be ready for the August meeting of said board.

Dr. Wallace presented a semi-annual financial report for the society and moved that it be accepted. Mr. Drawe suggested that the cost of collation for Engineers' Week meeting be charged to refreshments for monthly meetings. Dr. Wallace then moved that the financial statement be accepted as corrected, seconded by Mr. Freeman and carried. Discussion followed on the Proceedings' cost and type of publication. Mr. Freeman moved that the board adopt the following resolution:

"WHEREAS, the Proceedings of the Louisiana Engineering Society does not at present have the proper appeal to advertisers and readers,

"BE IT RESOLVED, that it is the desire of this board to go on record as favoring a change in the format and title of the society's publication, starting with the first issue of 1956, if it is economically feasible."

The motion was seconded by Mr. Edwards and the resolution adopted.

The secretary reported that 469 votes were cast in the ballot recently circulated for a constitutional amendment governing dues, of which 376 were in favor and 93 against, or a percentage of more than 80%. Accordingly, as of January 1, 1956 Article 6 of the constitution will read as follows:

The entrance fees and annual dues shall be as follows:

"Article VI—Entrance Fees and Dues	Entrance Fees	Annual Dues
Local Members or Local Affiliate Members	10.00	12.00
State Members or State Affiliate Members	10.00	10.00
Local or State Junior Members	5.00	5.00
Non-Resident Members or Affiliate Members	3.00	5.00
Non-Resident Junior Members	3.00	3.00
Student Members		1.00

"The annual dues for the current year shall become due on the first day of January and shall be paid in advance. A statement of the amount shall be mailed by the Secretary-Treasurer to each member at least thirty days prior to the due date. Quarterly payments may be made. A newly elected member or a member transferred from one grade to another shall be charged with dues beginning with the quarter following his election. A member transferred from one grade to another shall pay the difference in Entrance Fees of the two grades, and his annual dues shall be those of the grade to which he is transferred."

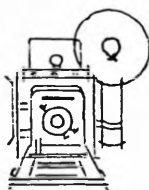
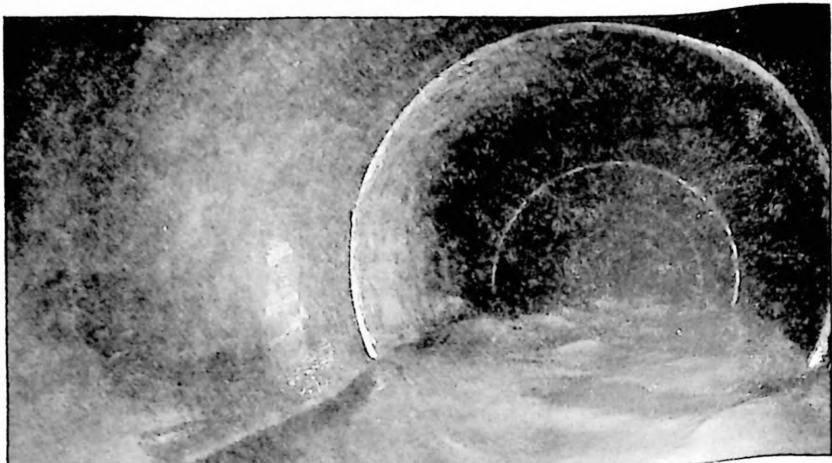
The secretary announced that 347 ballots were cast in the June membership election and only one blackball was received, therefore all persons named in the attached copy of ballot were elected to their respective grades.

The treasurer presented a statement of income and expense for the annual outing held on July 14, which disclosed a record attendance at the dinner and horseshoe pitching events. Attendance was as follows:

Horseshoe pitching	39
Golf	94
Dinner	266

A note of appreciation from Mrs. George L. Bott, thanking the society and particularly the members of the obituary committee for her father, the late Hampton Reynolds, was read. The secretary was instructed to forward the note to Mr. Scheib, Chairman of this committee.

A letter from Donald A. Coughlin, requesting resignation from his recent election to membership on account of his transfer to California, was read. Mr. Nelson moved that the election of Mr. Coughlin be declared void, seconded by Mr. Edwards and carried.



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A petition requesting an amendment to the constitution providing for increased rebates to state sections was read. Mr. Nelson moved that the amendment be accepted and presented to the membership-at-large at the next meeting. Motion seconded by Dr. Taylor and carried.

Mr. Drawe moved that the resignation of Alvin Gottschall be accepted with regret, seconded by Mr. Andrews and carried.

Mr. Nelson moved that Mr. John L. Martinez be appointed as Editor of the Proceedings, seconded by Mr. McLellan and carried.

Mr. Freeman moved that the secretary be authorized to purchase a letter file cabinet, seconded by Mr. Wallace and carried.

Mr. McLellan moved that Mr. Joseph Mooney be appointed Chairman for the 1956 Engineers Week, seconded by Mr. Freeman and carried. Mr. Freeman moved that Mr. Leo Holzenthal be appointed vice-chairman, seconded by Mr. Andrews and carried.

A letter from Mr. John E. Heard of Shreveport was read, and it was decided to refer it to the Committee on Professional, Civic and Industrial Affairs.

The secretary announced that nominations for recipients of the society's medal awards were in order and urged board members to submit any likely candidates to the Committee on Honors and Awards.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

**Minutes of Regular Meeting of the Society Held Jointly With The
Louisiana Section, A.S.C.E., August 1, 1955**

The meeting was called to order by President Seago in the Jackson Room, St. Charles Hotel, with approximately 230 members and guests present. The president welcomed members and guests of A.S.C.E.

Mr. Grevemberg moved that the reading of minutes of the preceding regular meeting be dispensed with, seconded by Mr. Nelson and carried. Whereupon the secretary read minutes of the June meeting of the Board of Direction. President Seago then read a proposed amendment to Article XIII. Section 2 of the constitution and called for discussion. None was forthcoming. whereupon Mr. Freeman moved that the amendment be submitted to the membership-at-large to be voted upon by letter-ballot. Motion seconded by Mr. Edwards and carried, after which the chair was relinquished to Mr. Roy T. Sessums, Chairman, Louisiana Section, A.S.C.E., who requested Mr. Leo Odom to present the speaker of the evening, Mr. Carl B. Jansen, President of the Dravo Corporation, who gave a most interesting talk on "Construction of the Foundations of the Mississippi River Bridge at New Orleans".

After the usual question period President Seago resumed the chair and thanked the American Society of Civil Engineers for obtaining such an excellent speaker and subject for the meeting. The meeting then adjourned with a rising vote of thanks to Mr. Jansen.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Board of Direction Held On Monday, Sept. 12, 1955

The meeting was called to order by President Seago with Messrs. Drawe, Nelson, Macdonald, McLellan, Poole, Wallace and Fernandez present. Messrs. T. J. Innes and Frank Riess, Chairman and Vice-Chairman of the 1956 Annual Meeting, also were present by invitation.

Mr. Poole moved that minutes of the preceding meeting be accepted as read, seconded by Mr. Nelson and carried. Mr. Innes then presented an outline of a program planned for the 1956 meeting to be held in Baton Rouge. After some discussion and clarification of certain points Mr. Innes was instructed to proceed with plans for the meeting.

Mr. Macdonald, Chairman of a committee to select nominees to fill a vacancy on the State Board of Registration for Professional Engineers and Land Surveyors, submitted a report recommending the following names to be submitted to the Governor for consideration:

Fred N. Billingsley, Jack S. Burk, Lionel J. Cucullu, Donald Derickson, James M. Todd.

Mr. McLellan moved that the board accept the report of Mr. Macdonald's committee and that it limit its recommendations to the Governor to those names selected by the committee. Motion seconded by Mr. Poole and carried unanimously.

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Mr. McLellan moved that the resignation of Dean C. McKee be accepted with regret, seconded by Mr. Nelson and carried.

A letter from the Louisiana Free Enterprise Association, Inc., extending an invitation to join that organization was read. Mr. Nelson moved that the matter be referred to the Committee on Professional, Civic and Industrial Affairs for recommendation. Motion seconded by Mr. McLellan and carried.

A proposed amendment to the Registration Law for Licensed Engineers and Surveyors, prepared by the attorney for the State Board of Registration was read. Mr. Nelson moved that the board approve this amendment and recommend to the Louisiana Council of Engineers that it be incorporated with the other amendments proposed for introduction at the 1956 session of the Louisiana Legislature. Motion seconded by Mr. Macdonald and carried.

Mr. Macdonald moved that the former Presidents Golf Trophy, now filled with the names of annual winners and replaced by a new trophy, be presented to Mr. F. N. Billingsley as a permanent trophy since his name appears most frequently as its winner; said presentation to be made on the occasion of Presidents' Night to be held in December. Motion seconded by Mr. Poole and carried.

Upon the recommendation of the board, President Seago appointed Messrs. C. M. Kerr, C. C. Barnard and E. L. Mire to prepare an obituary for our late member, Colonel Victor J. Bedell.

Upon the recommendation of the board, President Seago appointed Messrs. John L. Porter and John H. O'Neill to prepare an obituary for the late Dr. H. M. Shilstone.

Mr. McLellan moved that the secretary be instructed to announce to the membership that the Engineers' Club dining room would remain open for dinner on L.E.S. meeting nights and all those planning to attend were cordially invited to dine there before going to the meeting. Motion was duly seconded and carried.

President Seago appointed Messrs. McLellan and Drawe as a committee to submit to the Board of Direction at its October Meeting, the names of L.E.S. members for consideration as candidates for the annual Certificate of Appreciation for outstanding work on behalf of the Louisiana Engineering Society.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

**Minutes of Meeting of the Louisiana Engineering Society Held on Monday,
September 12, 1955**

The meeting was called to order by President Seago in the Jackson Room, St. Charles Hotel, with approximately 100 members and guests present.

Reading of minutes of the preceding meeting was dispensed with. The secretary then read minutes of the August meeting of the Board of Direction after which a representative from the Speakers' Bureau gave a brief talk in behalf of the United Fund Campaign.

Mr. Waldemar Nelson, Chairman of Local Arrangements, announced that the Tenth Annual Petroleum-Mechanical Engineering Conference would open on September 25 at the Roosevelt Hotel and invited all those present to attend.

President Seago then called on Mr. James H. Simpson, who introduced the principal speaker of the evening, Mr. F. N. Hansen, District Engineer, U.S. Geological Survey, who spoke on "Water Resources of Louisiana and the United States". After the usual question period the meeting adjourned with a rising vote of thanks to the speaker.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Board of Direction Held on Monday, October 3, 1955

The meeting was called to order by Vice-President Wallace, with Messrs. Andrews, Drawe, Freeman, Loflin, Macdonald, McLellan, Nelson, Taylor and Fernandez present. Messrs. F. L. Alcus and Calvin T. Watts also were present by invitation. Mr. Loflin moved that minutes of the preceding meeting be accepted as read, seconded by Dr. Taylor and carried.

The secretary reported that 410 ballots had been cast in the September membership election and that all persons named in the ballot were elected to their respective grades. The secretary also reported that 469 votes had been cast in the ballot covering proposed amendment to Article XIII, Section 2 of

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the constitution governing rebates to local sections, and that 452 were in favor and 17 were against the amendment. Accordingly, the proposed amendment will become effective January 1, 1956 and Article XIII, Section 2 will read as follows:

"The Board of Direction may annually assign, from the funds of the Society, to each local section, a sum not to exceed \$5.00 for each member belonging to that section, except Life, Honorary and Junior Members, and \$2.50 for each Junior Member belonging to that section."

Mr. F. L. Alcus, Chairman of the Committee on Honors and Awards, presented his report and advised that, though the report was unanimous, only three members of his committee were present at the meeting when selection of medal recipients was made. Mr. Macdonald moved that Mr. Alcus contact all other members of his committee by mail and submit another report at the next board meeting. Motion seconded by Mr. McLellan and carried.

Messrs. Drawe and McLellan reported on their selections for the Certificate of Merit. Mr. Nelson moved that the board receive their report and take it under advisement. Motion seconded by Mr. Andrews and carried.

The secretary read a note of thanks received from Mrs. Conrad Bostrom for flowers sent, and reported that Messrs. Roy E. Johnson and W. E. Douglas Jr. had been appointed to prepare the obituary for the late junior member, Conrad Bostrom.

Mr. Freeman moved that the resignation of the following be accepted with regret, seconded by Mr. Loflin and carried:

T. W. Parish, Jr. (Baton Rouge); Irwin A. Raben, (Formerly Lake Charles—moved to Texas), and Harry M. Trott, (California).

Mr. Drawe moved that Jerold E. Stoner be dropped from the rolls in accordance with his own request, seconded by Mr. Loflin and carried.

The secretary read a letter from the Chairman of Hire the Physically Handicapped Committee requesting that a message attached thereto be read at the society's regular meeting. Mr. McLellan moved that this be done; the motion was duly seconded and carried.

Mr. Freeman moved that Michael H. Reilly be reinstated to membership in the society, seconded by Mr. Nelson and carried.

Mr. Freeman moved that Mr. David W. Godat be appointed to the 1956 Nominating Committee, seconded by Dr. Taylor. Dr. Taylor moved that Mr. H. L. Lehmann be appointed to the same committee, seconded by Mr. Drawe. Both motions carried, whereupon the chair announced that the committee for nominating 1956 officers would consist of Dr. F. W. Macdonald, Chairman, Messrs. David W. Godat and H. L. Lehmann.

Discussion followed concerning Presidents' Night, and Mr. Andrews inquired as to the feasibility of the Vocational Guidance Committee encouraging high schools to include in their curricula mathematics and science courses for future engineering students. Discussion followed but no action was taken; however, this matter will be brought to the attention of the Vocational Guidance Committee.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

**Minutes of Meeting of the Louisiana Engineering Society Held on Monday,
October 3, 1955**

The meeting was called to order by Vice-President Wallace in the Jackson Room, St. Charles Hotel, with approximately 100 members and guests present. Dr. Wallace welcomed those in attendance. Mr. Loflin moved that the reading of minutes of the last regular meeting be dispensed with, seconded by Mr. Graham and carried. The secretary then read minutes of the September meeting of the Board of Direction. He also read a message concerning employment of the physically handicapped.

Mr. B. M. Dornblatt then introduced the speaker of the evening, Colonel J. G. Reynolds, Commander, Louisiana Military District, who gave a most interesting talk on "An Introduction to the Army's Guided Missile Program".

After the usual question period, the meeting adjourned with a rising vote of thanks to the speaker.

JOHN P. FERNANDEZ, Secretary-Treasurer

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Minutes of Meeting of the Board of Direction Held on November 7, 1955

The meeting was called to order by President Seago with Messrs. Drawe, Freeman, Macdonald, McLellan, Nelson, Poole, Taylor, Wallace and Fernandez present. Mr. McLellan moved that minutes of the preceding meeting be approved as corrected, seconded by Dr. Wallace and carried.

Dr. Wallace, Chairman of the Finance Committee, presented the third quarterly financial report of the society and moved that it be accepted. Motion seconded by Mr. Poole and carried.

President Seago, Chairman without vote of the Honorary Membership Committee, announced that over 80% of the entire committee had voted in favor of recommending Messrs. F. N. Billingsley and Ole K. Olsen for honorary membership. Mr. Freeman moved that these two gentlemen be made honorary members, seconded by Mr. Nelson and carried unanimously. In accordance therewith, the secretary was instructed to comply with Section I of Article VII of the constitution.

The secretary reported having received letters of thanks for floral offerings from the B. S. Nelson and V. J. Bedell families. Mr. Nelson moved that the resignations of Messrs. A. G. Meakin of Baton Rouge, John D. Taylor of Atlanta (formerly of Alexandria) and John A. Laurent, Jr., Massachusetts, be accepted with regret, seconded by Dr. Wallace and carried.

A letter from Little Farms Civic Association, requesting the society to endorse a resolution favoring the establishment of a state college for the Greater New Orleans metropolitan area, was read. Mr. McLellan moved to refer the resolution to the chairman of the Professional, Civic and Industrial Affairs Committee. Motion seconded by Dr. Macdonald and carried.

A letter from the Louisiana Free Enterprise Association requesting moral and financial support was read. Mr. Freeman moved that the secretary write to the association informing them that the society's very limited funds are totally designated for professional development and that it is the policy of the society to express its views publicly on professional matters only. It was the opinion of the board that moral and financial support of the association should be a matter for individual action and that the secretary should furnish the L.F.E.A. with a roster of society members to solicit individually if it desired to do so. The motion was seconded by Dr. Taylor and carried.

A letter from Dr. R. A. Steinmayer submitting his resignation as the society's representative on the Chamber of Commerce as of December 31 was read. The secretary was instructed to write and thank Professor Steinmayer for his excellent, faithful and meritorious service over the years in which he has represented the society.

President Seago announced that Mr. Knight, Chairman of the JET Program Sub-Committee on Vocational Guidance, was in need of help in implementing the program and if any board member or member-at-large would be willing to assist his services would be greatly appreciated.

The secretary read a letter from Mr. C. Glenn Cappel proposing a nominee for the Technological Accomplishment Medal, and his reply stating that the Honors and Awards Committee already had met and made its selection but that the recommendation would be referred to the 1956 Honors and Awards Committee. At this point Mr. Poole was excused and left the meeting, after which the secretary announced that the committee had selected Mr. Homer G. Fritchie of Slidell to receive the A. M. Lockett Civic Activities Medal and Mr. Wiley D. Poole of Baton Rouge to receive the Technological Accomplishment Medal. Mr. Nelson moved that the board approve the committee's selections, seconded by Dr. Taylor and carried.

Mr. Drawe, a member of the special committee appointed to select a nominee for the society's Certificate of Appreciation, read his committee's report in which Mr. Clayton L. Nairne was recommended to receive an honor in recognition of his work as Chairman of the Reorganization Committee. Mr. Freeman moved that the board accept the committee's recommendation, seconded by Dr. Macdonald and carried unanimously.

The secretary read a letter from Mr. Mario G. Zervigon, Chairman of the Publications Committee, addressed to his committee members, giving an outline of proposed changes in the society's publication and requesting their comments and suggestions. The secretary then expressed a few ideas along these lines and was requested to forward them to Mr. Zervigon for consideration.

It was decided to hold the usual Presidents' Night meeting in December, and Vice-President Wallace was named Master of Ceremonies.

The secretary advised that the Alexandria Section had requested the L.E.S. to extend a welcome to the American Association of State Highway Officials convening in New Orleans December 7-10. The board authorized the secretary to do so.

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President Seago stated that the society would have to move its headquarters from the St. Charles Hotel in the near future. Mr. Poole moved that, if such a change became necessary, headquarters be moved to the Engineers' Club, subject to the latter's approval. Motion seconded by Dr. Wallace and carried.

Dr. Macdonald inquired as to the activities of the Louisiana Council of Engineers and also reported that the dates set for the 1956 Annual Meeting in Baton Rouge conflicted with several large carnival balls.

During the latter part of the meeting Mr. Charles P. Knost, Chairman of the Vocational Guidance Committee, arrived and reiterated President Seago's remarks about the Jet Program and Mr. Knight's need for assistance.

The president announced that the Nominating Committee would convene in the near future and urged members to make recommendations for nominees for the various offices. The meeting then adjourned in order that the society's regular meeting could begin on time.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Regular Meeting of the L.E.S. held jointly with the New Orleans Section, American Institute of Chemical Engineers on Monday, November 7, 1955

The meeting was called to order by President Seago in the Jackson Room, St. Charles Hotel, with approximately 100 members and guests present. The president announced that this was a joint meeting with the New Orleans Section, AIChE and welcomed their members and guests.

Mr. Knost moved that the reading of minutes of the previous meeting be dispensed with. The motion was duly seconded and carried, whereupon the secretary read minutes of the meeting of the Board of Direction held on October 3.

Mr. W. S. Oliver, Chairman of the Baton Rouge-New Orleans Chapter of the American Society for Quality Control invited the members of L.E.S. to attend its forum to be held at Loyola University on December 17.

Colonel Jack Knight made an eloquent plea for assistance in conducting the Junior Engineer Training Schedule (JETS) in the various high schools.

Mr. Knost announced that the American Institute of Electrical Engineers would hold a lecture on Nuclear Energy on Thursday, November 17 at the Engineers Club and all members of L.E.S. and AIChE were invited to attend.

There being no old or new business, the chair was relinquished to Mr. Walter Godchaux, Jr., Chairman, AIChE, who introduced the principal speaker of the evening, Dr. M. H. Bigelow, Director, Glendale Plaskon Laboratory, Toledo, Ohio, who gave a beautifully illustrated lecture on "Factors Promoting the Rapid Growth of Plastics". After a lively question period the chair was returned to President Seago, who announced that the Nominating Committee would convene in the near future and the membership was urged to send in their recommendations. He then thanked the AIChE for obtaining such an excellent speaker and the meeting adjourned with a rising vote of thanks to Dr. Bigelow.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting Louisiana Engineering Society, Alexandria Section, September 22, 1955

A buffet supper was served by the Ladies Auxiliary. Mr. Edwards thanked Mrs. Baker, Roland, Edwards and Hunter of Ladies Auxiliary. Mr. Levy made a motion which was seconded and passed that the Secretary write the Ladies Auxiliary commending these ladies for the fine buffet supper. By motion the reading of the minutes was dispensed with. Mr. Edwards urged that all who could make arrangements to attend the L.E.S. Convention meeting at The Belmont Motel in January in Baton Rouge. All of the visitors were acknowledged and welcomed.

Mr. Seago and Mr. Nelson were presented. Mr. Seago spoke with regard to the Engineering registration law and changes needed. Mr. Cresep presented Mr. Hu B Myers who made a very interesting talk on the Overton Red River waterway tracing the history of navigation on Red River including the studies made by the La. Department of Public Works. The latest figures of costs and engineering data were given. \$200,000 has been appropriated to date for planning. Total estimated costs \$85,000,000. Mr. Myers answered many questions about the proposed canal. At the conclusion of Mr. Myers speech the meeting was adjourned.

C. W. COOK, Secretary-Treasurer

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**Minutes of Meeting Louisiana Engineering Society, Alexandria Section,
Regular Meeting**

There were 26 present. Mr. Edwards, President, opened the meeting. It was moved and seconded that the reading of the minutes be dispensed with. A report of the nominating committee by Mr. Barron was given as follows: Nominations: Mr. T. David, President, Mr. E. Levy, Vice President, and Mr. D. Sandefur, Secretary-Treasurer. The secretary was instructed to get out letter ballots. No nominations were made from the floor. A motion was made and seconded that the nominations be closed. Each member has the right to write in additional choices on his ballot. Ballots must be in by December 5. A suggestion was made from the floor that this meeting be held at the usual time 7:30 to open ballots and report.

Dr. Frank Macdonald, Moderator, Dr. Donald Derickson, President, La. State Board of Registration for Engineers and Land Surveyors, Dean Ben T. Bogard, La. Polytechnic Institute and Mr. Calvin Watts, Director of La. Dept. of Public Works. Above distinguished guests will be on the program. Questions will be invited.

Our Christmas party will be held Wednesday, December 14 at 7:00 p.m. at the Alexandria Country Club. The menu and entertainment were decided. It was suggested that nominal gifts be brought as usual. This was turned over to the Ladies Auxiliary. January 19-21 is the annual meeting of the State Convention in Baton Rouge. It was moved and seconded that flowers be sent to immediate members of families of members who are deceased. This was carried. A resolution was made by Mr. Levy and seconded that flowers be sent to members who are in the hospital. This was carried. It was moved that two candidates be selected each year by the nominating committee. After a discussion it was decided that the secretary ask the parent organization whether more than one candidate may be selected by the nominating committee for future reference. After dinner, Mr. Charles Dupree of the Bell Telephone Company made a very interesting talk and demonstration on the types and uses of transistors and solar cells as developed by the Bell Telephone laboratories. As there was no further business, the meeting was adjourned.

C. W. COOK, Secretary-Treasurer

Minutes of Meeting, Baton Rouge Section, Louisiana Engineering Society

Date: Nov. 16, 1955; Time: 7:30 p.m.; Place: Agricultural Eng. Hall, L.S.U.; Officers Present: Wiley D. Poole, President.

The meeting was called to order by President Wiley D. Poole and the speaker for the evening was introduced by Mr. Guy Miller. A most interesting lecture and demonstration was given by Mr. B. F. Lieper and Mr. P. F. O'Deay of the Remington Rand Division of the Sperry Rand Corporation. Mr. J. P. Fernandez and Mr. Mallard Seago of the State Section in New Orleans were in attendance at this meeting.

W. L. SUTTON, Secretary-Treasurer

Minutes of Meeting, Baton Rouge Section, Louisiana Engineering Society

Date: October 19, 1955; Time: 7:00 p.m.; Place: Gulf States Utilities Auditorium. Officers present: Wiley D. Poole, President; F. G. Hornsby, First Vice President; Randall Meyer, Second Vice-President; W. L. Sutton, Secretary-Treasurer.

This meeting was a joint meeting with the Baton Rouge Section, of American Institute of Electrical Engineers, who were in charge of the program. Southern Telephone & Telegraph Company gave a demonstration of their micro wave system and transmission and had a working model of their micro wave transmission system. Forty-four members of Louisiana Engineering Society and the A.I.E.E. were in attendance.

W. L. SUTTON, Secretary-Treasurer

Minutes of Meeting, Baton Rouge Section, Louisiana Engineering Society

Date: Sept. 15, 1955; Time: 7:00 p.m.; Place: WBRZ TV Studio; Officers present: Wiley D. Poole, President; F. G. Hornsby, 1st Vice-President; Randall Meyer, 2nd Vice President; W. L. Sutton, Secretary-Treasurer.

Forty-nine members and guests assembled at the studio of WBRZ TV, Louisiana's newest and most powerful VHF television station. There were several engineers present from the RCA Corporation, who split the society up into small groups and gave a most interesting tour of the TV station. After viewing the technical part of the station the members were permitted to watch several program, both live and on films.

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Minutes of Meeting, Baton Rouge Section, Louisiana Engineering Society

Date: June 18, 1955; Time: 2:00 p.m.; Place: United Commercial Travelers' Park; Officers present: Wiley D. Poole, President; F. G. Hornsby, 1st Vice-President; Randall Meyer, 2nd Vice President; W. L. Sutton, Secretary-Treasurer.

Eighty-three members and guests assembled at the United Commercial Travelers' Park on the Hammond Highway for an afternoon of horseshoe pitching and general good fellowship. Several members of the State Section in New Orleans were in attendance. After the horseshoe pitching the members and guests adjourned to the log cabin for dinner and drawing for the prizes was held immediately after dinner. All agreed that this was one of our most successful June outings.

W. L. SUTTON, Secretary-Treasurer

Minutes of Meeting, Baton Rouge Section, Louisiana Engineering Society

Date: April 21, 1955; Time: 7:00 p.m.; Place: Agricultural Engineering Auditorium, L.S.U.; Officers present Wiley D. Poole, President, Randall Meyer, 2nd Vice-President; W. L. Sutton, Secretary-Treasurer.

The meeting was called to order by President Wiley D. Poole, who conducted a short business session. Mr. Grady Carlisle, of the Louisiana Dept. of Highways, gave a very interesting talk on the long range program for Louisiana Highways and gave a very interesting report on the traffic situation and the status of Louisiana Highways as of today. There were twenty-nine members and guests present.

W. L. SUTTON, Secretary-Treasurer

**Minutes of Meeting of the Lafayette Section, Louisiana Engineering Society,
October 13, 1955**

The October meeting of the Lafayette Section of the Louisiana Engineering Society was a dinner meeting and was held Thursday, October 13, 1955 at Poor Boy's Riverside Inn.

The meeting was called to order by President Loflin with approximately 23 members present. Mr. Boudreaux moved that the reading of the minutes of the preceding meeting be dispensed with, seconded by Mr. Guillot and carried.

President Loflin then announced that some objections had been made as to the meeting date. After discussion it was decided to hold all regular meetings in the future on the fourth Tuesday of each month.

Preliminary plans were made for the joint meeting of various LES sections by telephone hook-up which is scheduled for December. It was also suggested that one of the spring meetings be planned as an outdoor meeting.

President Loflin announced that the annual meeting would be held at Baton Rouge on January 19, 20 and 21 and urged all members to attend. He also made a brief report to the membership of the business transacted at the recent meeting of the Board of Direction.

The President then appointed the following standing committees for 1955-56:

(1) Membership: Magee J. Moss, Chairman; Ashby Stevens, R. O. Beckham, Jr., Harry Dula, J. F. Kerr, Hanson Hall, L. J. Decourt, Robert Chappuis, W. J. Johnson; (2) Program: John R. Gaugler, Chairman; E. E. Guillot, F. W. zur Burg, B. W. Boxx, J. E. Jarman; (3) Entertainment: Felix Boudreaux, Chairman; Emory Domingue, Magee Moss; (4) Greetings: R. J. Cambre, Chairman; James H. Booksh, A. M. Bujard, Ken H. Woodward, Henry Busch, Frank Sonnier, R. E. Jenkins, Godfrey Marine; (5) Publicity: P. B. Cambre, Chairman; Chas Compton, Louis Mann, J. R. Troxler, A. E. Faulk; (6) Vocational Guidance: J. W. McCampbell, Chairman; Tom Clark, L. C. Landry, Russell Elliot, F. L. Larue, D. J. O'Rourke.

There being no further business motion was made by Mr. Jenkins that meeting be adjourned, seconded by Mr. Bonnet and carried.

WARREN R. HOLLIER, Secretary-Treasurer

**Minutes of Meeting of Monroe Section, Louisiana Engineering Society
September 13, 1955**

The last meeting of the Monroe Section of the Louisiana Engineering Society was held in the Cameo Room of the Virginia Hotel, Monroe, Louisiana.

The meeting was called to order at 7:30 p.m. Guests and new members were introduced.

There being no formal business conducted at the June meeting, which was the annual barbecue, the minutes of the March 2, 1955, meeting were read and approved.



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The secretary read a letter from Mr. Fernandez advising that there would be a statewide telephone hook-up and discussion this December 5, concerning the proposed engineering law changes. Also read was Mr. Andrews' reply stating that our section would like to participate in this and that our meeting date of December 6, would be changed to December 5, in order to coincide with the telephone hook-up date.

Mr. A. D. Williams asked if there was a committee either in the state organization or local section that could advise subjects to be taken in high school to help engineering students and also encourage the study of engineering as a career.

This matter was referred to Dean Bogard of Louisiana Tech who advised that this was part of the work of the Vocational Guidance Committee and that they were working along these lines at the present time.

Mr. Andrews introduced our speaker for the evening, Mr. Harry C. Martin, who gave a very interesting talk on "Some Aspects of the Paper Industry."

After a lively question and answer period, the meeting was adjourned for refreshments.

C. L. DENSON, Secretary-Treasurer

Minutes of the Regular Meeting of the Shreveport Section of the Louisiana Engineering Society Held March 1, 1955

The meeting was called to order by President O. J. Dykes Jr., at 7:00 p.m. in Shreveport Municipal Airport Restaurant. Thirty-four members and five guests were present.

At the request of the president Mr. E. M. Freeman gave a very informative report on the State Convention of the Society held in New Orleans in January.

Program Chairman Robin Hood, called on Mr. E. M. Gillin to introduce Mr. W. Lebmaun who in turn introduced the speaker Mr. Grady Carlisle. Mr. Carlisle gave an informative discussion on the proposed highway program for Louisiana.

There being no further business, the meeting was adjourned.

WM. E. FITZGERALD, Secretary-Secretary

Minutes of the Regular Meeting of the Shreveport Section of the L.E.S. Held June 14, 1955

The meeting was called to order by President O. J. Dykes, Jr., at 7:00 p.m. in the Eleanor Room of the Magnolia Hotel. Thirty-three members and two guests were present.

Mr. W. W. Alsup, Chairman of the Charter and Rules Committee, submitted the following resolutions for the consideration of the membership.

"Resolved: That in the future, unless reservation for dinner meetings are canceled within 24 hours of the official meeting time, the member making a reservation and not attending or cancelling same shall be billed with the cost of same to this organization. Also be it resolved that the cost of meals, where reservations are made shall be 50c per plate less than cost of meals when reservations are not made."

This motion was seconded by Mr. Robin Hood and was approved by the members present.

We were honored by having Mr. R. M. Seago President of L.E.S. and Mr. W. S. Nelso 2nd Vice President L.E.S. as our guests. Mr. Nelson was introduced by President Dykes and Mr. Nelson in turn introduced Mr. Seago. Mr. Seago gave a short informative talk on various projects for the State Society towards closer coordination between sections.

Program Chairman Robin Hood, presented two films on Shreveport Growth, which were enjoyed by all.

There being no further business the meeting was adjourned.

WM. E. FITZGERALD, Secretary-Secretary

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