

#2720

THE PROCEEDINGS

OF THE

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Arthur M. Hill, Editor

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LOUISIANA ENGINEERING SOCIETY

Vol. 39

MARCH, 1953

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Our New President. Michael Charles Abrahm is the 56th President of the Louisiana Engineering Society. "Mike," as he is known to his wide circle of friends, has been active in various engineering affairs of the state. His careful survey of the possibility of the establishing of the Engineers and Architects Club helped to make this organization a reality. He is a past chairman of the New Orleans Section American Society of Mechanical Engineers.

President Abrahm graduated from Tulane University in 1924 with a degree of Bachelor of Engineering in Mechanical and Electrical Engineering. He is now Principal Engineer of the New Orleans Public Service Inc.

Mrs. Abrahm has been active in the work of the Woman's Auxiliary to the Society. The family consists also of Helen Claire, Marilyn, Sabina and Michael C. Abrahm, Jr.

The many friends of our new President wish for him a most successful administration.

A Message from Our President: The progress of the country, state, and community depends upon the technical progress by the engineering profession. This fact should be made known to the people and the governing political regimes. That worth-while ideal is one of the three points I have set as a goal for 1953.

Now, since approximately two-thirds of our membership is outside the metropolitan area of the City of New Orleans, our second point is that of closer coordination between the Sections and New Orleans, and also between the Sections themselves. In furtherance of this, we will set up a standing committee entitled "Sections Coordination Committee."

My third goal strives toward securing programs of maximum benefit to our members.

I hope that these aims meet with the approval of our members. Whatever suggestions you can make for the upgrading and betterment of our Society will be thankfully received and seriously considered. I have accepted this job with the sincere hope that I can handle it successfully and do my bit for the engineering profession.

MICHAEL C. ABRAHM

Report of the Retiring President: As I relinquish the office of President of your Society, with which you honored me a year ago, I would like to take the opportunity of reviewing briefly some of the activities of the Society and its accomplishments during my term of office. This I do more from a desire to record the facts for future reference than to claim any special credit for myself or my administration for what has been done.

During the year the Society engaged in numerous activities, only a few of which I shall undertake to catalogue:

As one of the engineering groups comprising the Louisiana Council of Engineers, the Society took a leading part in the preparation of recommendations submitted to the Charter Committee of the City of New Orleans and to the Mayor and members of the Commission Council of the city, with respect to the Home Rule City Charter that was being formulated by them. Unfortunately, the recommendations submitted by the Louisiana Council of Engineers to the effect that the engineering functions of the City of New Orleans should be consolidated under one department of the city, headed by a licensed professional engineer, were not adopted by the said city agencies.

Along with other engineering groups of the Louisiana Council of Engineers, the Society took an active part in endorsing and fostering certain amendments to the New Orleans City Building Code (Chapters 48, 52 and 53) suggested by the City Building Code Committee on Amendments.

Another important activity was in the field of vocational

guidance. The accomplishments of the Society's Vocational Guidance Committee, under the chairmanship of Mr. Lionel J. Cucullu, were outstanding, the Committee having contacted over 4000 high school students throughout the State with the purpose of interesting them in an engineering career.

The members of the Society's Legislative Committee, under the chairmanship of Mr. Waldemar S. Nelson, were on the alert during the period that the State Legislature was in session, and carefully scrutinized all proposed legislation for any changes that might thereby be effected in Act 73 of 1950, regulating the practice of professional engineering and land surveying.

The Society was instrumental in having two of its members, Mr. John L. Porter and Mr. Allan T. Dusenbury, appointed to the Citizens' Planning Committee of the City Planning and Zoning Commission.

The Society took an active part in the convention of the Union Panamericana de Asociaciones de Ingenieros (UPADI) held in New Orleans August 25-29, 1952, which meeting, undoubtedly, was most effective in promoting friendly relations and good will among the engineers of the Central and South American countries, Canada and the United States.

The Society, in co-operation with the National Society of Professional Engineers, took an active part in promoting "Engineers' Week" which was inaugurated during the past year in order to bring to the attention of the public the important part played by the members of our profession in the progress of the Nation.

In connection with these and numerous other activities, so many of the members of the Society contributed their time and ability, sometimes at considerable personal sacrifice, that space will not permit their being named individually. It is indeed gratifying, however, to know that the members are willing to give so freely of their time and effort for the good of the Society and of the engineering profession, without compensation other than the pride and satisfaction of having done a good job. To each and every one of them, particularly to Mr. John P. Fernandez, the Society's very conscientious and capable Secretary-Treasurer, who, as usual, gave his all, with a smile; to Mr. William J. Drawe, Jr., General Chairman of the Annual Meeting, and all his committee personnel, for their time and effort in making the 1953 Annual Meeting an outstanding success; and to Mr. John F. Vogt, Jr., chairman, and members of the Technical Papers Committee, for the splendid programs provided throughout the year, I wish to express the Society's as well as my own personal appreciation and thanks.

The Secretary-Treasurer's report covers the record of the Society's finances, its membership and other statistics, which indi-

date the continued healthy position of the Society and its Sections.

In closing, permit me to assure you of my deep appreciation of the honor that you conferred upon me by electing me president of the Society, and permitting me to serve you in that capacity during the past year. I am sincerely grateful for the co-operation and assistance so cheerfully give to me by my fellow-officers and directors, which greatly lightened the burdens of my office and contributed so much to the conduct of the Society's affairs during the past year.

JOHN A. McNIVEN

Our Annual Meeting. This year the number of papers presented were reduced. All sessions were well attended, with an excellent registration number. Chairmen William J. Drawe, Jr. and Vice-Chairman David Moodie, together with all the chairmen and vice-chairmen of the committees are to be congratulated. A job well done!

New Members. The following election took place on the December 1952 ballot. We welcome these new members to the Society:

For Member

HENRY G. ARMATIS, New Orleans; age 45. Endorsed: A. E. Abaunza J. E. Rebold, J. P. Fernandez. Univ. of Nebraska, B.S.M.E., 1932. Member Sigma Tau. Registered C.E., Nebr.; C.E., M.E. La. Loup River Power Dist., Columbus, Neb., Hydraulic Engr., 1932-40 Higgins Industries, Engr. in charge design and const. City Park and Industrial Canal Plants, 1940-45. Higgins, Inc., Plant Engr. charge mtce. and const. at Ind. Canal plant, 1945-47. Ajax Machine Works, Engr.-Estimator, 1947-49. A. N. Goldberg, subsurface work. 1949-50. Atlas Erection Co., partner, 1950. Welding & Mfg. Co., Engr.-Estimator. 1950-date.

FREDERICK D. BROUSSARD, Baton Rouge; age 39. Endorsed: L. Duclous, F. A. Hannaman, Jr., L. J. Lassalle, La. State University, B.S.E.E., 1933. U.S. Dept. of Interior, Surveyor, 1933. Esso Standard Oil Co., 1934 to date, now General Foreman Paraffine Dept.

FLOYD M. CRUM, Baton Rouge; age 30. Endorsed: M. B. Reed, A. K. Ramsey, L. J. Lassalle. La. State University, BSEE, 1947; MSEE, 1950. Institute of Radio Engrs., Assoc. Mbr. Registered E.E., La. Louisiana State University, Instructor, Asst. Professor, E.E. Dept., 1947-date. Naval Research Lab., E.E., summers 1951-52. U.S. Air Force, 1942-45.

JAMES F. KERR, Opelousas; age 52. Endorsed: C. D. Brown, W. J. Johnson, Jr., H. E. McDowell. Texas A & M College, B.S.C.E., 1923. Registered C.E., Tex. Member Am. Railway Eng. Ass'n., S.A.M.E. Missouri Pacific Lines, Asst. Engr., present employment. Previous employment: Colonel, U.S. Field Artillery; Project Engr., Civil Aeronautics Admin.; Asst. Dist. Engr., Land Acquisition, Div. Bureau of Biological Survey, now Fish & Wild Life Service; Jr. Engr., U.S. Corps of Engrs.; Resident Engr., Rich's, Inc., Atlanta, Ga.

WILLIAM E. McFARLAND, Reserve; age 51. Endorsed: W. Godchaux, Jr., L. J. Lassalle, G. R. Hammett, A. W. Betz, W. S. Leake. La. State University, Audubon Sugar School, B.S. 1924. Member AIChE, Am. Soc. Sugar Cane Technologists, Alpha Chi Sigma. Godchaux Sugars, Inc., Efficiency Engr., 1925. Hershey Corp., Cuba, Asst. Supt. of Fabrication, 1926-28. Godchaux Sugars, Inc., various engineering positions, 1928 to date; Plant Manager, Reserve Refinery, since 1941.

RUSSELL E. PARDEE, New Orleans; age 33. Endorsed: W. K. Bankston, A. H. Jensen, D. W. Stewart. Alfred University, N. Y., B.S. Ceramic Eng., 1941. Mexico Refractories Co., Supt. Specialty Plant, 1941-43. U.S. Navy, 1944-46. Gladding, McBean & Co., San Francisco, 1946-47, Ceramic Engineer. Mexico Refractories Co., 1947-date, District Sales Engr. & Mgr. Southern States. Mbr. American Ceramic Society.

JEFF M. STEWART, Shreveport; age 45. Endorsed: W. W. Alsup, E. M. Freeman, G. A. Marsalis. University of Texas, B.S.A.E., 1929. Registered C.E., Texas. Mosher Steel Co., Dallas, Draftsman, Design Engr, Shop Supt., Mgr. Branch, Sales Engr., 1929-45. Industrial Steel Products Co., Vice-Pres., 1945-52.

For Transfer From Affiliate To Member

STAYTON L. PERRY, Alexandria; age 49. Registered M.E., La. Supt. Power, Light, Water and Sewer Dept., Natchitoches, La., 1929-44. Supt. Water Dept., City of Alexandria, La., 1944-date. Member Am. Water Works Ass'n., Am. Public Health Ass'n.

For Transfer From Junior To Member

JOHN HENRY SCHLUTER, New Orleans; age 30. Louisiana State University, B.S.M.E., 1948. Registered M.E., La. Board of Commissioners, Port of New Orleans, Mechanical Engineer, 1948 to date.

For Junior Member

DAVID O. GARRED, JR., Shreveport; age 26. Endorsed: C. B. Foster, Jr., K. A. Hetrick, Louis Primos. Finlay Eng. College, Kansas City, Civil Eng. April 1948-July 1950, B.S. Wigers & Garred Const. Co., 1950-51. Great Lakes Pipe Line Co., Chainman, Inst. work, Mar.-Nov. 1951. Barksdale Air Force Base, C.E., 1951-52. City of Shreveport W & S Dept., Engr., June 1952-date. Licensed Engr.-in-training, Mo.

EVERETT K. JOHNSON, JR., New Orleans; age 24. Endorsed: R. N. Graham, S. D. Louchis, J. P. Fernandez. Tulane University, Chemical Engineering, 1944-47. U.S. Army Corps of Engrs., New Orleans, 1948-date, Engineer, hydraulic investigations, flood damage surveys.

WILLIAM A. MARLIN, Lake Charles; age 27. Endorsed: C. W. Stokes, G. B. Walther, S. D. Nolan. University of Houston, B.S.E.E., 1952. Affiliate Member, AIEE. Cities Service Ref. Corp., Trainee, E.E. drafting.

GEORGE E. McLEAN, New Orleans; age 28. Endorsed: B. Louviere, R. L. Gilbert, Wm. Massimini. St. Louis University, B.S. Aero Eng., 1950. Technical Member, Inst. of Aeronautical Sciences. McDonnell Aircraft Corp., Design Engr., 1950-51. Gulf Engineering Co., Sales Engineer, Jan. 1952-date.

ALFRED W. SCHOEFFLER, Lafayette; age 22. Endorsed: E. Domingue, R. J. Cambre, D. J. O'Rourke. Southwestern La. Institute, B.S.C.E., 1951. La. State University, M.S. Hydr. Engr., 1952. Southwestern La. Institute, Asst. Prof. C.E., 1952. Phillips Petroleum Co., Lafayette, Draftsman, summer 1951 and part time 1947-51.

Your Salary Begins Next Month. Because of the high rate of income tax, plus hundreds of unseen taxes, most salaried workers "donate" to government their salary for three or four months of the year. The burden of the taxes is not for the necessary items, but the various "welfare" projects insisted upon by our "do-good" government. Consider the agricultural picture. Taxpayer's money is handed over to the farmer as an inducement to improve pastures, let us say. He follows practices that any progressive farmer would do of his own accord, expecting to do so with his own money. But our benevolent farm agencies insist that it is "for free." The cows on the improved pasture produce more milk and butter, so much so that there is a "surplus". Then the taxpayer is forced to put up more money to purchase the surplus produced by the first payment of improving pastures! At this writing, the butter purchases by federal agencies amount to one million pounds per day, plus milk and cheese. These products will of course either spoil and be destroyed, or be sold to the "unfortunate" countries at a fraction of their cost. Did any one mention socialism?

SS UNITED STATES*

The subject of this talk is the *SS United States*, the world's safest and fastest ship. In speaking about a ship, particularly to an Engineering Society, it is customary to describe in detail the components of the ship, her arrangements, her machinery, etc. Such will not be the case of this talk.

The *SS United States* is different. This is the theme and subject of this talk. In some small way it is the intention of the speaker to convey to you the basic differences, which make the *SS United States* unlike any other ship ever built and probably unlike any future ship. Also in passing it is intended to mention some of the details which help to make this ship different.

Of course, at this point it is worth mentioning that one of the things which makes the ship different from the outset is the fact that we cannot discuss maximum horse power, speed or certain details of machinery.

She is unique—not alone for the fact that she is the world's fastest passenger liner—but also for the host of new and unusual features—hitherto untried on ships—which contribute to make this vessel the world's safest and most modern.

Everyone knows the speed record of her first voyage. Another performance, which is essentially far more important, is the fact that she has run for six months—10 voyages—a sea distance of 64,460 miles at an average speed of about 31-knots, which is a record for any ship afloat.

Even before the design work began, the liner was assured of being different because of the revolutionary new concepts under which she was to be built. Six years ago when the seed of this ship first began to germinate it was decided that she should be an express liner of remarkable speed, safety and efficiency — and easily and quickly converted to a naval defense vessel — but this ship was to be in every respect the world's foremost passenger ship — in comfort; in appointments; and in service. Think of this—a ship to carry 14,000 men, a full modern division of troops, and their equipment — but to look and in all respects to be a passenger liner, without comparison. Not a passenger ship to be laid up in a shipyard for six months or a year at the outbreak of hostilities while being converted to a naval vessel, but a ship which could at the outbreak of hostilities leave immediately with more troops than most of our World War II ships could carry at any time, and between successive trips be rapidly converted, in steps, to full capacity.

* By Newbold T. Lawrence, Vice-President United States Lines Co. Presented at the Annual Meeting of the Louisiana Engineering Society Jan. 9, 1953.

It was only natural that, born of such specifications, the design would be unique and would incorporate advanced ideas. Faced with the problem of building a ship large enough to carry 14,000 troops—with food, water and oil enough for a 10,000 mile voyage; yet small enough to use the Panama Canal — the designers used ingenuity and imagination to accomplish this. In solving this problem there was no compromise on safety or quality; on the contrary the ship designed exceeded all the existing safety requirements, while incorporating such advanced engineering design as to insure not only the most remarkable efficiency and reliability, but also the most remarkable speed.

I would like to separate, in discussing the ship, the features which resulted strictly (1) from design; (2) from the shipbuilder's problems and (3) from operating experience. It has long been my contention that the shipping industry and all others concerned with shipping in any way have overlooked the importance of the third phase in any ship's life — the phase of operation. This stage which is, of course, the test of whether the first two have done a good job, contributed much to the new features on the *SS United States* — but due to the fact that for the first time in the construction of a ship an unusually close full time liaison between designer, builder and operator existed, most of the new features are of cooperative rather than individual origin. Thus it will be impossible to correctly separate and give credit accurately. Most of the new features will, therefore, fall into the class of design, since they are covered by plans or by specifications or resulted as developments of plans.

One of the more advertised differences, which is strictly to the designer's credit, is the absence of wood in the vessel. Such emphasis was put on this feature that standard equipment had to be completely rebuilt in some cases. This was true, for example, in the telephone switchboard, barber's chairs, laundry equipment, etc.

Turning to new and unusual features developed independently or cooperatively during the design stage, these can be classified broadly in three categories: (1) those resulting from the previously mentioned requirement that a vessel be constructed to carry a division of troops and their equipment; yet be capable of using the Panama Canal; and (2) those resulting from passenger ship requirements and experience and (3) those resulting from the designer's determination to produce the safest ship in the world.

The new features resulting from the necessity of building a passenger-naval defense vessel combination can be further classified as: (1) those resulting from the necessity of full utilization of all available space, and (2) those resulting from naval defense requirements over and above the space saving requirements.

In the first group fall the use of new light weight high strength

alloys; the use of light weight high strength materials; the use of new space-weight saving construction techniques; and the use of new operating concepts designed primarily as weight and space saving ideas.

While the use of new alloys is so widespread that it is difficult to say exactly the extent to which they have been used, a few examples of the more important cases will suffice as illustration. At this point it is well perhaps to explain why it is difficult to accurately conceive the extent to which new alloys, materials, etc. have been used. To begin with, the builders in each purchase order include a small tome of admonitions and exhortations designed to persuade the vendor to deliver the lightest, strongest and best piece of equipment he had ever produced. Following this, William Francis Gibbs, who is as many of you well known, a gentleman of unwavering purpose and convictions, paid personal calls on virtually every vendor. As a result new and unusual materials have been used in places where, costwise, no vendor previously thought of using such materials.

Most important of the new alloys are: (1) the high tensile steels used in parts of the vessel; (2) the seagoing aluminums used in non-strength bulheads, in decks, in superstructure, stacks, appurtenances and equipment, such as lifeboats, davits, lighting fixtures, furniture, decorations, duct work, cable covering, etc.; and (3) the use of copro-nickel piping for all saltwater systems.

In the field of new materials one of the more important is the use of latex compositions with light weight aggregates as a substitute for wood and ceramic tile deckings. No seams to pay and caulk on the *SS United States*; no wood to holy-stone and sand scrub.

Other instances of light weight materials are: (1) the specially designed and specially built aluminum furniture; (2) the light weight silicone insulated aluminum covered cable; (3) light weight aluminum clad marinites; (4) foam glass both as an insulation and as a medium for the sculptures in the dining room. Consisting of four five-foot high central figures, representing the "expressions of freedom"; numerous small figures; and medallions approximately six inches in diameter of the great seals of all the states; the combined weight of all the sculptures in the first class dining room does not much exceed 350 pounds.

In construction, space and weight saving resulted from the use of a modified framing system, which consists of clever combinations of longitudinal girder systems with conventional rib framing. Deck strength is developed by a careful combination of longitudinals and beams allowing for maximum headroom. While

the framing system is not unique, the combinations in which it is used is at least unusual.

Also in construction the use of weldments, rather than castings, was developed to an unusual degree. The greater part of each of these weldments was built up of rolled and shaped thick steel plates welded together in an intricate pattern. Some of the joints in these weldments have twenty-four to thirty passes of weld for a single connection.

Cast piping manifolds are not found on the *SS United States*—built-up welded manifolds, much neater and lighter, promise to give far better service. The piping connecting to these manifolds in the many varied systems has a minimum of bolted joints—welding again doing the job better with less weight.

The framing system touched on briefly before, plus the very clever combination of welding and riveting in the hull girder has enabled the designers to eliminate the expansion joints which inherently plague the big passenger ships. This not only saves space, but is calculated to save us, the operators, considerable maintenance in future years.

The swimming pool got the space-weight treatment also. Its sides required strength because the pool entered into the compartmentation picture. If double casing were installed to gain the strength, then the pool would lose precious inches in size—result: monel clad steel—strength combined with lining in a single unit material.

This was a scene to watch during the construction—sneaker clad welders and grinders carrying out their work under constant supervision lest they mar the satin-like finish of the monel. No one was ever more careful of the finish of their own furniture than were the quartermen assigned to the pool.

Another construction weight-saver was the use of rubber tile rather than ceramic tile in the passenger bathrooms. Another was the development of light-weight stairs using stiffened sheet steel rather than plate.

These are many other weight and space savers. Some, while not new, were unusual in the degree to which carried out. This is particularly true of the features resulting from operating concepts in the design stage. In this category we find fresh water supply. The ability to make water to maximum purity in the amounts required for passenger-ship operation has evidently fired the imagination of other big ship operators. Newspaper accounts report the anticipated conversion of the "queens" to making, rather than freighting, water. Another feature in connection with fresh water is a special control system on the dishwashers, which, if allowed to run free, constitute one of the greatest fresh water wasters aboard ship.

Also in this category is the A.C. electric plant. Use of A.C. has long been advocated for ships but never before has anyone boldly advanced complete and thorough use of A.C. Only the absolute minimum of DC is tolerated and this is provided at the point of use by inversion.

Naturally there are some—let us say the most important and most costly—unusual features which must be grouped together as the military requirements over and above the ordinary ship. Foremost is the speed—power feature so jealously guarded by all concerned with the vessel and her building and so eagerly sought by all reporters. The extent and quality of the air conditioning is another feature in this class. The unqualified success of the air conditioning is the talk of passenger ship circles in general.

Other items in this category which will be mentioned here are the oil capacity and excess cold storage capacity. These, as has been said, are sufficient to carry a division of troops ten thousand miles.

Naturally, there are other features which are not here mentioned.

The features resulting from passenger ship requirements will be touched upon lightly here. These are not of the grave importance of the preceding but they also lend something new to the ship. Most of these also have a double purpose, serving one duty in peace and another in war. These fall on two major sub-divisions: (1) those resulting strictly from passenger trade requirements; and (2) those resulting from operating experience in the North Atlantic.

Larger cabins than are usual; larger public rooms and two theaters; telephone in every cabin; careful combination of fluorescent and incandescent lighting; special entertainment broadcast equipment; and individual climate control for every cabin and public space, are some of the features resulting strictly from passenger traffic requirements. The last mentioned item is extremely important to our passengers and crew. Its success brings daily inquiries as to the mechanics of the system which, in its basic elements, is as follows: fresh, clean ocean air is preheated, cooled and reheated as required to give clean fresh air of 60 degrees temperature and relative humidity in the comfort zone. This degree is delivered to each individual room where the passenger, by thermostat, controls his own individual small hot water heater and heats the air from 60 to 85 degrees as he desires. There are no thermometers in the rooms, so that the passenger adjusts the temperature to his comfort and not to the degree of temperature he thinks may be most comfortable.

Some of the new features result from North Atlantic passenger trade operating experience. These, in part briefly mentioned, are mechanized pontoon and hatch covers; use of patented automobile

handling and stowage gear; use of the latest in navigating equipment; an entirely modern galley with sheathed ceilings; stainless steel equipment; mechanized garbage ports; electric control of dish washer supply and overflow; radaranges capable of broiling steaks in 30 seconds. Also in this category is the ice making equipment which automatically produces seven tons of flake ice and over a ton of ice cubes each day. In this category also fall a host of minor items, such as inconel name overlays for bow and stern; anchor chain indicators; reflection plotters for radar, and side port opening gear. One feature which comes to mind at this point, out of proper sequence, of course, is the elimination of the "unfit for drinking" signs which the U. S. Public Health requires on wash water systems. This was accomplished by installing a chemical treatment system — double-barrelled protection actually — since the water is evaporated in the first place. One step beyond this again are the steam pressure cookers. In this case the distilled water is again redistilled, that is, the distilled water is converted to steam which contacts the food or surgical dressings.

Of a separate order under the major heading of items developed in the design stage are those features by the designer in his determination to build the safest and best ship afloat. Here we can mention the unusual compartmentation; here too we find such features, unnoticed usually by passengers, as fewer watertight doors without sacrifice of access and egress, absence of deck penetrations at sides, many small tanks rather than a few large.

Unnoticed also by passengers, who usually take all mention of ship's safety as concerns fire prevention with somewhat indifference, until their indignation is aroused by such disasters as the "Noronic", are the fire prevention and fire fighting equipment. Here on a ship built of incombustibles, on a ship to which a passenger must bring his own fuel if he wished to build a fire, is the most intricate of fire detection and fire extinction systems. Master-minded by a continuous watch in a damage control room, where pneumatic systems return continuous air samples from holds, for electric eye observation; where thermostatic alarms from all public spaces, stores areas, indicate whether all is well; where manual alarm stations ring in; where constant contact can be maintained with the four emergency squad stations, the entire ship is held under constant surveillance. In addition to all this, fire watchmen routes are maintained during the night.

Fire extinction is equally diversified — fixed semi-automatic systems for holds and boiler rooms; fixed automatic system for galley exhaust hoods; fixed manual systems for paint rooms, electric stations; portable CO₂ systems for engine spaces; fog nozzles; hand extinguishers throughout the ship; diversified fire pumps with sev-

eral sources of power, including completely independent prime movers; and, of course, steam for tanks.

Naturally the vessel is broken up for fire zones — Automatic fire doors which close throughout the vessel at the flick of a single switch, breaking the ship into small zones with continuous fire barriers. In addition each stateroom is in itself a fire zone, holding a fire within its confines.

In designing and building the safest and best ship, the design agent and Newport News Shipbuilding & Dry Dock Company carried out a well calculated plan of duplication and separation of vital machinery and equipment—much of this not normally talked about. One example is an indication of the thought given—that example is the double loop parallel fire main, making it possible to get water to any point by more than one route no matter what the derangement.

In addition to safety features, the designer required the latest in technical advances, changing horses in midstream as it were, to get that which was best. Here we have as an example—rate steering—the latest in automatic steering. For the first time an automatic pilot with anticipation—an iron helmsman—clever enough to give opposite rudder before the ship has met her course.

These foregoing notes conclude my brief discussion of the class of items developed individually or cooperatively in the design stage. In the construction stage, the builders also had some unusual firsts, some of these resulting from necessity and some from the builders' wholehearted acceptance of the challenge to build the best ship while saving space and weight.

Under the first of these orders fall some interesting oddities; a 990-foot ship built in a 960-foot dock; use of tremendous quantities of wood in construction. Actually over 1,200,000 board feet of pine boards alone, and over 6½ miles of pine poles had they been end to end. Another oddity that comes to mind are the deep freezes, which were distributed throughout the ship—not as incentives—but to hold the aluminum rivets at sub-zero temperatures required for driving.

In the second grouping were the many space and weight savers, such as using welding wherever possible (over 500,000 lbs. of welding rod used); using aluminum for ducts; in bathroom fixtures; using lightweight insulations; doing such fair steelwork that only a ridiculously small amount of underlay was required under rubber tiling; prefabricating aluminum shower stalls; and many, many more such items.

This brings us to the third class of items—those of a strictly operational nature, which were in origin, if not in complete develop-

ment, a product of the operators. This discussion is perhaps already too long; therefore, this group of items will be disposed of quickly.

Examples of this last group of items, from a safety standpoint, are the training and use of four emergency squads, the planned and controlled handling of tanks for continuous stability check, and the installation of valve location diagrams in each fire station throughout the ship.

From the passenger and cargo handling standpoint, examples are the special gangways and escalators, and the special techniques of handling mail and automobiles. Here, for instance, we have found it necessary to leave mail in slings intact to give the quickest handling.

On the *United States*, as on the "America", we have been able to have approved a continuous survey, enabling us to give the maximum attention to inspection without losing the service of the ship for an extended period.

There is much that should be said about this ship, for she is unique; built by the cooperation of designer, shipbuilder and operator, with the help of American industries' top flight engineers; built to the exacting standards of all the American regulatory bodies — The A.B.S., U.S.C.G., U. S. Public Health, A.I.E.E., etc.; built also to the exacting standards of the U. S. Navy; the maritime administration — and the British factory act was not overlooked

We Americans have a ship — the safest ship, with ability "to withstand collision damage more than twice that required by international standards — a standard of safety unprecedented for a merchant ship", quoting Admiral Shepherd — a ship — the most beautiful and most comfortable afloat; a ship — the fastest, with something in reserve; a ship — that has re-established American supremacy on the ocean, and which will maintain that supremacy.

A ship of which America is proud — the *SS United States*.

THE ENGINEER AND A NATION'S PROGRESS*

In asking me to address you this evening, I realize and greatly appreciate the honor and friendship you are extending to my country, Canada. It is fraught with true Southern hospitality in that while we have been neighbors, as countries, for many years, the Canadian Government opened its first Consulate to serve the Southern States exclusively, in New Orleans, during the past twelve months, and you promptly recognized its presence through this graceful gesture of this afternoon.

It is a happy continuation of the cordiality and good will which was expressed by you and your colleagues in other parts of the United States when on September 10, 1952 at the Centennial of Engineering in Chicago, Illinois, you graciously bestowed on my Chief, the Right Honorable C. D. Howe, M.E.I.C., Minister of Trade and Commerce for Canada, the much prized Hoover Medal . . . it being the first time that medal has been bestowed on a citizen of another country.

It is understandable, therefore, that Mr. Howe, on learning that you were honoring Canada on this occasion welcomed it as an opportunity to convey his felicitations to you, and to your President Mr. McNiven who, prior to coming to New Orleans, was an associate of Mr. Howe's in the C. D. Howe Construction Company. This letter, which I have been instructed to present to your President reads as follows:

"Dear Mr. McNiven:

It is with personal pleasure that I send greetings to the Louisiana Engineering Society through you, my old friend and former colleague. In those early days, when you went to New Orleans to erect a grain elevator for my old firm, neither you nor I could have anticipated this pleasant occasion. A third of a century has seen the city of New Orleans flourish and grow as never before. In that time Canada has matured and stands high in the regard of the nations.

"The Louisiana Engineering Society has grown with the twentieth century and is typical of modern engineering advancement. The achievements of the Society, its high aims and fine objectives, give practical expression to the more personal aspirations of the members. No engineer worthy of his salt is content alone with the mechanics of a structure. Into every building, no matter how utilitarian, the engineer puts a positive something of himself. The Louisiana Engineering Society is to be congratulated on giving tangible

* Presented at Annual Meeting, January 8, 1953, by Gerald A. Newman, Consul of Canada and Trade Commissioner.

recognition to personality by your awards of medals for Technological Accomplishment and for Civic Activities.

"I should be grateful if you would extend to all your members, throughout your chapters, my sincere congratulations on your accomplishments and your objectives together with my best wishes for a bright future.

"With kindest personal regards,

Yours sincerely,

(Signed) C. D. HOWE"

Gentlemen, your annual convention falls at a time of year when most of us, be we merchants, industrialists or individuals, are wont to take stock or inventory. We examine the record of the past, assess our present capacities and then determine our future needs in light of defined purposes. In so doing, we seek to give ourselves a sense of direction.

It is, I believe, the intent of a keynote address to contribute a sense of direction to your deliberations. Other speakers, better qualified than I am will undoubtedly deal with engineering problems, but in this address, delivered by a layman, you may be expecting the expression of some of the undertones of thought that will be present during your deliberations. Such undertones are not peculiar to the engineering profession — they are the milieu in which we all live and breathe as a people, and enable us to act and go on together for a common good.

Consequently, the topic which has been chosen for their expression is "The Engineer and a Nation's Progress". Under it our inventory of thought can be made in three progressive categories: The Engineer as Technician; The Engineer as Citizen; and the Engineer as a Contributor to the Future.

The engineer and progress are inextricably related. The presence of the engineer with his particular qualifications and purpose heralds the intention of material improvement. The engineer's outlook and training is one that demands the overcoming of difficulties. What engineer would be worth his salt if he accepted defeat before he started to work on bridging a river? No, all an engineer can admit is that he has problems — never unsolvable problems mind you, but merely those that take time — and a little cash. Of course, the absence of the latter may prevent the work from going on, but that is the fault of someone else — not the engineer.

What's more — the engineer is right! Providing that our premises are sound, why should any of us bow to suggestions of inability, failure or fear? Let us away with such debilitating thoughts. Let them be foreign to our spirit both as individuals and nations,

and let us accept the engineer's maxim that what we cannot do today, we will do tomorrow!

I suppose that my main qualification for speaking to you is that I am the representative of a country whose people are highly conscious of their indebtedness to the engineer for their progress as a nation.

The present capitol of Canada is a tribute to the discrimination of a Colonel Bye, R.E. Early in the nineteenth century he established Byetown on the Ottawa River during the course of building a series of military canals to link the Ottawa, Rideau and Trout Rivers. Byetown was later selected by Queen Victoria as the capitol site and its name changed to Ottawa.

Canada would never have had Dominion from Sea to Sea if the engineer's skill had not been available to build a trans-continental railway across immense and difficult terrain following the Confederation of four Eastern provinces in 1867. The railway insured the joining of the Confederation of the more westerly "states" or provinces in defiance to geographic and economic forces which dictated a north and south flow of traffic and interest rather than from West to East.

Canada, with its small population of 14,000,000 people, would not be the third greatest trading nation in the world today, superceded only by the United States and Great Britain, were it not for the presence of the engineer. By building elevators and railways he opened the way for Canada to become one of the world's largest exporters of wheat. By harnessing the power of rivers and waterfalls he made the use of cheap hydro-electric power possible for the conversion of immense woodland resources into pulp and paper and textile fibres.

Ores mined from the Pre-Cambrian Shield and transformed into nickel, copper, lead, zinc and gold; iron ore and steel production and in their wake manufacturing everything from silk stockings to jet engines bespeak the presence of the engineer's support of Canada's economy.

This fact was demonstrated dramatically last year. The Canadian Government removed all restrictions on Canadian currency and the Canadian dollar shot up to 1%, 2%, 3%, 4% and finally 5% in value over the United States dollar. Shocked United States publicists began making inquiries. And what did they find? They found the engineer was still at work.

He was building cement and other industrial plants in Newfoundland. He was building a 300 mile railway to new iron ore bodies of immense value between Labrador and Quebec. He was seeking oil and gas wells in the Prairie Provinces and laying a network of pipes to carry it to either the West or East Coast cities. He was busily engaged on the Pacific Coast in building, among other

things, a new aluminum plant with a capacity of 500,000 tons of aluminum per annum. And for its electric power he was damming a small river flowing East from the Rockies, and then draining off its water Westward, by a ten mile tunnel through the Rockies to turn the turbines of a plant which itself is being built a quarter of a mile within a mountain.

Yes, the engineer was, and is, indisputably at work in contributing to Canada's progress as a nation.

What has been said of the engineer's contribution to Canadian progress can be repeated with equal force in respect to the United States or, within recent years, to the Southern States. The Canadian Government opened its first office in New Orleans because of the tremendous upsurge of industry in the South. We were very much like the old sourdough who recently came to Vancouver. An enterprising paper sent its reporter to interview the old man. "Why", he asked "have you come to this country?" "Well," he replied, "its like it says in them there noospapers, 'Ladies hemlines are gettin' shorter and necklines are gettin' lower.' I don't know whar theys goin but I sure aims to be present when they gets there!"

In this age of industrial achievements, the progress of any nation is highly dependent in the technical services of the engineer. It is significant that the *New York Times* reported recently that the United States was needing 50,000 more engineers than it has and much the same, though in smaller figures, can be said of Canada.

Enough has been said to illustrate that the engineer has become increasingly responsible for achievements on which the physical progress of a modern nation depends. Indeed, his handiwork is in the warp and woof of the pattern of everyday life of each individual. As we move into the electronic and atomic era our dependence on the engineer is bound to become even more apparent. It would be more exact to say — as the electronic and atomic era moves in on us — for it is questionable if we, as a society, have kept pace with our technical discoveries.

History has shown that since the industrial evolution began, there has been a lamentable lag between physical and technical progress and the social adjustments which these changing conditions make necessary. None of us are apt to question that this serious situation is with us today; serious because the tempo of change and increasing range of physical power is widening the gap between the social and the industrial evolution. The result is a world in turmoil.

Can the engineer, therefore, afford to stand blandly aside, concentrate on his technical achievements without also accepting some of the responsibility for their social implications? One does not have to go very far afield to learn the results of such a course. Two world wars have written their answer in large and bloody

letters in the sands of time. One has only to recall that in Germany, the home of some of the most advanced engineers and technicians in Europe, they and their works were turned to evil purposes by fanatics, and eventually to their own and others destruction.

It is heartening, therefore, to note that the members of your profession recognize today that along side his work as technician the engineer has an equally important role as a citizen. It lighted the addresses of two eminent members of your profession speaking at the Centennial of Engineering in Chicago this past September.

Mr. Benjamin F. Fairles, President of the United States Steel Corporation, in accepting the John Fritz Medal Award, said, "I believe that in every part of our society, America needs, as never before, the disciplined mind of the trained engineer — a mind that is eternally dedicated to the pursuit of truth, and rigidly governed by the facts of our national life."

Said the Right Honorable C. D. Howe when he received the Hoover Medal on the same occasion, "We have all, I think, been forced to the conclusion, by the harsh realities of our times, that neither men nor nations can afford to remain unconcerned about the destiny of other men, or other nations.

"We, as engineers, by our technological achievements took a prominent, if unconscious, part in bringing about this change of attitude. It was the application of our technology that made the world smaller and more interdependent. *It seems to me that, in turn, we must and should take an active part in the attempt to solve the problems we have helped to create.*"

These statements were made by men who were practicing what they preach.

And to the list of engineer citizens could be added a galaxy of eminent names in both your country and mine who have contributed much to the country's social as well as technological progress. We find them in every state and community. Your Louisiana Engineering Society is fostering this type of contribution through your Andrew M. Lockett Award — the L.E.S. Civic Activities Medal, which is given to an engineer who has rendered distinguished service to the community without compensation for such service. It is also very gratifying that this year it is being presented posthumously to a former Canadian.

May I, therefore, compliment your Society for its able recognition of this important need of the engineer's services as citizen as well as technician.

May I also add a word from personal experience of the effectiveness of the engineer as citizen — in this case of the engineer turned executive.

It has been my good fortune for the past five years to work in Ottawa in the Department over which the Right Honorable C. D.

Howe is Minister. My colleagues and I soon found that the engineer turned executive is accustomed to make decisions quickly. He wants the facts and he will listen to a brief explanation of their implications. He expects and relies on the assumption, that in presenting this brief and timely advice—you in turn have thoroughly investigated and satisfied yourself on all aspects of the problem. The very manner of his approach demands and lays emphasis on integrity.

Secondly, this engineer turned executive expects that after he has given a decision, his associates will get things done and without excuses.

And finally, he works — how he works — with, as he himself admits, an incurable optimism.

Here is an approach to problems with an emphasis on integrity, courage and strength, and that indispensable ingredient, hard work. We know in Canada that this approach pays off handsomely in bouyant and effective results, and are prepared to prescribe it as a solution to much that confronts us today. Yes, there is a great and useful place for the engineer citizen.

In my remarks this afternoon, I have endeavored to bring out that with increasing importance of the engineer in a nation's progress — there is also an increasing and urgent need for his services as a citizen — that an engineer has, by training, certain qualifications which can contribute much to overcoming the social and national difficulties of which we are all conscious today.

We come now to the third and last phase of this address — the engineer's contribution to the future.

Arnold J. Toynbee, the renowned world historian, writing in a recent issue of *The Atlantic Monthly*, had this to say of the future:

"Our racing technology has now suddenly brought within point blank atom-bomb range of one another a number of human societies that are still psychologically poles apart because, in the sailing-ship age, horse-cart age, and wheelbarrow age in which we have been living right into our own life-time, these societies have been insulated from one another. We need time to give them their chance of growing as close to one another in spirit as they now are in body; and this need for time spells a need for patience and for mutual forbearance."

We also know that today, and in the foreseeable future, we are confronted by a section of the world which is deliberately annihilating individual and national integrity by whatever means at its disposal. Its fanatic leaders seek world domination — a domination based on gross materialism, ignorance and fear. Indeed, its beliefs and purposes are the very antithesis of the thinking of the Ameri-

can people expressed in the Constitution of the United States and the Bill of Rights.

Is it not obvious, therefore, that if it is the avowed intention of these fanatic worshippers of materialism and personal power to destroy man's integrity, we for our part, must do everything possible to maintain it both at home and abroad, both as individuals and as nations.

Now I know of no way in which a man or a nation can exercise both forbearance and strength without returning to the foundational truths of being which to most of us in this Western World means Christian thinking embodied in the First Commandment and the Golden Rule. I am not alone in this view. It has been expressed repeatedly in his own terms by the President of the United States, it has been underlined by the man in the street by his turning to the Churches of his forbearers. From East to West and from North to South throughout this mighty nation, people are recognizing the need for spiritual strength.

I have said that the engineer is synonymous with progress, but progress can never be found along the road of reactionary materialism which characterizes Communism nor can it be found in inflating the power of an individual or individuals — all the wars of the world tell us that.

No! Progress and the key to the future is to be found in the engineer's avowed pursuit of truth — the recognition and acceptance of certain basic spiritual laws whereby one must live and construct our civilization.

I have found in my limited experience that it is what a man truly believes and thinks which governs his future experience. Surely then, the engineer, with his realistic appraisal of the implications of atomic power, his patience gained in constantly working with his fellowmen — and his deep and sincere respect for truth and integrity has a great deal to contribute to the future of this nation in his relations at home and abroad.

Surely, the engineer's realistic optimism, based on true and unassailable values gives needed strength and courage to his nation in its course through the uneasy seas of the future. Surely in the future as in the past the engineer will be found tending the power-plant of the Ship of State.

ENGINEERING BRIEFS

Housing in Egypt. In recent months, considerable attention has been devoted to housing and shelter developments and materials in the Middle East, especially in Egypt and in such oil-wealthy areas as Kuwait and Bahrein on the Persian Gulf. The Gulf areas boast of modern housing and a greatly improved standard of living, financed ultimately by the vast oil revenues. Unfortunately, however, Egypt's resources have not been exploited to bring about parallel advantages for most of its people.

A recent study made by U. S. engineers, sponsored by the Technical Cooperation Administration (Point IV) in cooperation with the Ministry of Social Affairs of the Government of Egypt, has pointed out feasible steps for improving the living conditions of Egyptian workers. The TCA study was concerned chiefly with village housing, since most of the existing improvements had been made for industrial workers. Although these projects meet some of the need for housing, they are much too expensive for the villages. Some of the *esbas*, or villages on large agricultural landholdings, have good housing facilities planned, built, and managed by their owners, but the *esba* developments are few in proportion to the population, and cannot begin to satisfy the existing need. With the passing of the large estates, this type of housing may come under some cooperative type of enterprise, and, with the help of Government subsidies, may become more widespread.

Three village housing developments have been sponsored by the Government in recent years. The villages built at Bahtim, 10 miles southwest of Cairo, in 1934 and 1936 were constructed of sun-dried brick, and almost all are still in excellent condition. Another village is now being constructed at Gournah, across the Nile from Luxor, and also uses sun-dried brick. About 60 houses have been finished, along with a mosque, schools, market buildings, and a recreation center. This project, using low-cost materials, may serve as a model for future villages. Another village, at Kafr Saad in the northern Delta region, has two-story houses, and provides housing for more than 4,000 people.

Most of the *fellahin* (peasants), however, live in some 4,000 villages which have no recreation areas, where the houses are close and crowded, and where the streets are winding and serve also as receptacles for waste water from the homes. Goats, cattle, water buffalo, and other domestic animals roam the streets, and there are often stagnant pools where clay has been dug. Usually the only public buildings are the mosque and schoolrooms, which the villagers themselves build.

The typical home consists of two or three rooms, with one used as a stable; the only door is wide enough for the animals. The family lives and eats on the floor, in close contact with the animals.

There are no sanitary facilities of any kind, and water for cooking and washing is carried in jugs on the heads of women from canals or the Nile, in which the cattle and people bathe. The fuel supply, animal and agriculture waste, is stored on the roof; since cooking is done just below, frequent disastrous fires sweep the villages.

Limiting Factors

Any large-scale plans for improving village housing must be formulated with these habits and customs in mind, since the houses must be acceptable to the people who are to live in them. Problems are presented by rainfall in some localities, and the scarcity of many building materials. In addition, the population is increasing at the rate of one per cent annually, and more of the available land is being used non-agriculturally. There is less than $\frac{1}{2}$ acre of arable land per person in all Egypt; open ditches use land equivalent to 15 per cent of this total. Above all, the annual wage of \$91 for the average *fellah* makes it imperative that the cost of housing be kept at a minimum.

In exploring various materials and methods of construction, the TCA group found that there is no wood for construction purposes in Egypt; steel is prohibitively expensive, and even cement and concrete are in such great demand in the cities and so expensive to transport that they cannot be considered. The study confirmed the fact that the only feasible building material in agricultural areas is Nile Valley clay, which has been used for construction since the time of the Pharaohs. Sun-dried mud-brick homes with domed roofs in Upper Egypt, the area of little rainfall, have lasted literally thousands of years. These bricks, however, will not withstand the rain of the Delta region, and here modern improvements are needed. It was found that the clay can be mixed with three per cent of a bituminous or oil stabilizer to produce a brick wall which will withstand rainfall in most areas. Where the rainfall is extremely heavy, red-brick reinforcement at points of stress is satisfactory.

The TCA group designed a model house of two or three rooms, made of oil-stabilized brick, with a few wooden fixtures used as trimmings and as suspensions for hanging household equipment. An enclosed courtyard provides space for toilet facilities and for the animals. The roof is mostly domed, but some sections are left flat for storage and for summer sleeping space. The courtyard oven has a flue going through the wall, under the built-in bed to provide heat in cold weather, and out into the court, to reduce the fire hazard. The estimated cost of such a house is between 200 and 300 Egyptian pounds (\$560-\$840), less than half the cost of the houses being built in current projects.

Plans are progressing for building an experimental group of

houses of this type, both in the rainy part of the Delta and in the dry area farther south along the Nile. Mechanical mixing equipment could produce bricks of uniform quality, and local labor could be used for all but special skills. A demonstration is being planned to impart these skills to the Egyptians, who all have a high degree of mechanical aptitude. To conserve land, it is proposed to continue building the houses in tight blocks or rows. Although the eventual design may not incorporate all these suggestions, the *fellah* will soon be able to utilize his own labor and readily available materials to build himself a satisfactory house at low cost.

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

* * *

Let's Keep the Record Straight. There has been too much loose talk about prices, wages, dividends, taxes. Let's see.

Compare 1939 (the last normal year before the war) to 1951 (the last year for which there are figures).

Prices have gone	up	86%
Weekly earnings of production workers	up	172%
Dividends of corporations	up	148%
Federal Taxes	up	843%

By the use of more efficient machines, industry has been able to increase wages twice as much as prices have risen, and has increased dividends to its millions of owners. If you don't feel that much better off, put the blame where it belongs . . . on taxes. Authorities say 10 billion dollars could be cut out of those taxes without affecting government safety or service a particle.

Remember the figures. Just for the record.

— *From Warner & Swasey*

* * *

Other Worlds. Dr. Joseph A. Pearce of the Dominion Astrophysical Observatory in Victoria, British Columbia, told at a joint meeting of the American Astronomical Society and the Pacific Astronomical Society of the discovery of two gigantic stars—one, thirty-three and the other thirty-seven times as massive as the sun. These stars are revolving around each other at a relative speed of 450 miles per second, 1,620,000 miles per hour.

Twice in about every 45 hours an eclipse occurs, namely, each time one of the stars which makes up the double system passes in front of the other. This happens because their orbits are almost exactly in our line of sight from the earth.

These newly discovered stars are exceedingly hot, blue white, with temperatures of approximately 33,000 degrees Centigrade. Our sun has a temperature of 6,000 degrees.

One of the stars is about 35,000 times as bright as the sun, the

other about 26,000 times as bright. The first one is about 800 times the volume of our sun, the other 600 times the sun's size. The centers of the two stars are 11,500,000 miles apart.—*From Power Notes*

* * *

It's Your Money They're Spending. Rep. Gardner Withrow (R., Wis.) has been conducting a one-man investigation of mats, which shows how the taxpayer is being used for one.

The mats in question are steel—the kind used by the military for speedy construction of aircraft landing strips. The congressman's interest was aroused by a junk-dealer's ad offering used landing mats for sale during the current military build-up.

Withrow's researches showed that the junk dealer, perfectly legally, had bid 67¢ a ton for surplus Navy landing mats in 1947, and that the Navy had accepted the bid. This man then resold the mats for \$30 and \$35 a ton to others. Asking price when the congressman saw the ad had climbed to \$75 a ton.

Now, at the same time, Withrow finds that the Army is buying new landing mats and paying \$157 a ton for them.

If you want to get rid of money in a hurry, selling at 67¢ and buying at \$157 is a pretty effective way of doing it.—Washington Report, Chamber of Commerce of the United States, August 8, 1952.

—*From Power Notes*

* * *

Assuring A Slow Burn. Inspection of hand grenade fuses at the factory, especially once they're loaded, is a most difficult and critical job—in fact, a matter of life and death. If the fuse isn't packed with the proper amount of time-delaying slow-burning powder, premature explosion might result, possibly in the soldier's hand.

Now, many soldiers' lives will be saved by a completely automatic hand grenade fuse inspection machine. Developed by General Electric's X-ray Department, it uses extremely sensitive cadmium sulfide crystals as x-ray detectors, eliminating the danger of human error in inspection.—*From General Electric News Digest*

OBITUARY OF WILLIAM CLARK HAMILTON

With the death, on July 13, 1951, of William Clark Hamilton, the engineering profession and his many friends suffered a great loss.

'Bill' was born July 7, 1907 in Helena, Arkansas, the son of Claude Hamilton and Gertrude Phares Hamilton.

He began his education in Helena, attended high school in Clarendon, Arkansas, where he was a valued member of the football team. He prepared himself for his chosen profession at Arkansas State College, Jonesboro, Arkansas finishing with his Civil Engineering Degree in 1932.

He began his professional career with the U.S. Engineers Corps, working out of the Vicksburg District until 1934, when he became associated with the Louisiana Highway Commission, with whom he worked through the year 1937. After this period he transferred to the Mississippi Highway Department for the years 1938 and 1939.

In 1940 he entered the U. S. Army, Corps of Engineers as a 2nd Lieutenant. He served at Fort Benning, Georgia until 1941 with the exception of three months during which time he attended a School of Communications at Fort Knox, Kentucky.

In late 1941 he was transferred to Camp Polk, Louisiana where he remained until January 1943. During this time he attained the rank of Major and the responsibility of Post Engineer, being in charge of all construction and maintenance in this Training Camp of 45,000 men.

In January 1943 he was transferred to the Prisoner of War Camp at Ruston, Louisiana as Post Engineer, where he remained until his separation from the U. S. Army in March 1946.

Shortly after this time he was again associated with the Louisiana Department of Highways where he remained until his death at which time he was Assistant Maintenance Engineer in the Sixth District.

He was an active member of the First Methodist Church at Baton Rouge. He was also a member of the Masonic Order, Louisiana Highway Engineers' Association, American Legion and Disabled American Veterans.

Bill was a man who was extremely zealous and conscientious in his work. He was loved and respected by all those who knew him well.

It is therefore fitting that we honor the memory of William Clark Hamilton by adopting the following resolution:

BE IT RESOLVED, that the Louisiana Engineering Society adopt resolutions embodying the facts as expressed above.

BE IT FURTHER RESOLVED, that this resolution be included in the minutes and published in its proceedings and that copies be sent to his family.

H. L. LEHMANN

E. A. LANDRY

OBITUARY OF

E. LEE JONES

A true member of the engineering profession, E. Lee Jones, Chief Civil Engineer of the Arkansas Natural Companies for the past 32 years, passed away early Wednesday morning, October 8, 1952, in a Shreveport hospital. He was born in Smithburg, West Virginia, July 23, 1884.

Mr. Jones was an alumnus of Ohio State University and was an active member of the engineering societies of Louisiana, Arkansas and Texas.

His association with the Arkansas Companies began November 1, 1920, when he was named Chief Civil Engineer, a position which he held at the time of his death. During the years of 1913-1914 he served with the Civil Engineering Departments of the cities of Columbus and Cincinnati, Ohio, and the Ohio Fuel Supply Co., Columbus, Ohio. He was a member of the Engineering Department of the United Fuel Gas Co., Charleston, West Virginia, from 1914 until he joined the Arkansas Companies in 1920.

As a member of the Noel Memorial Methodist Church, Shreveport, he had for several years served on the Board of Stewards.

Funeral services were held in Shreveport, with Dr. F. M. Freeman, Pastor of Caddo Heights Methodist Church, and Dr. George Ivey, Vice-President of Centenary College of Shreveport, officiating. Members of his Civil Engineering Department acted as pall bearers. The body was taken to the old home at Smithburg, West Virginia, for burial in the Archbold Cemetery, where four generations of his family now rest.

He is survived by his wife, Chesna Iris Jones; two sons, Robert Lee of Lafayette, Louisiana, and S. Frank of Shreveport, Louisiana; and two sisters, Miss Mary F. Jones of Smithburg, West Virginia, and Mrs. B. B. Langfitt of Salem, West Virginia.

Respectfully submitted,

T. F. CASH, *Chairman*

CARL HADRA

A. J. SHOUP

MINUTES OF THE MEETINGS AND BUSINESS OF THE SOCIETY

Minutes of Meeting of the Board of Direction Held on Monday, Oct. 13, 1952

The meeting was called to order by President McNiven with Messrs. Abrahm, Duclos, Macdonald, Molaison, Myers, Seago, Sessums, Wallace and Fernandez present. Mr. Macdonald moved that minutes of the preceding meeting be accepted as read, seconded by Mr. Molaison and carried.

The order of business was dispensed with to permit Mr. Wallace to keep another engagement. Under the heading of Old Business, a vacancy on the State Board of Registration for Professional Engineers and Land Surveyors was discussed, and Mr. Macdonald moved that the list to be submitted to the Governor consist of the following names:

Ardis D. Jackson, Frederick W. zur Burg, Frederick N. Billingsley, Max P. Watson, James C. Posgate, Horatio Nash Ogden, and Waldemar S. Nelson. The motion was seconded by Mr. Wallace and carried.

Mr. Dulcos moved that the Nominating Committee for 1953 officers of the Society consist of the following: Harry P. Newton, Chairman, Lionel J. Cucullu, Wm. H. Rhodes. Motion seconded by Mr. Wallace and carried.

Mr. Abrahm reported that the N. O. Section, American Society of Mechanical Engineers, would like to participate in the new type of program as proposed at the September meeting and would share the cost of same; he then moved that the offer of ASME be accepted, seconded by Mr. Sessums and carried.

The treasurer presented a quarterly financial report and announced that all applicants listed in the September ballot had been elected to their respective grades.

The report of the Honors and Awards Committee was read, in which it was recommended that the Civic Activities Medal be presented posthumously to Albert B. Paterson, and the Technological Accomplishment medal to C. Glenn Cappel. Mr. Sessums moved that the committee's recommendations be adopted, seconded by Mr. Macdonald and carried.

A letter from Mr. N. E. Lant, Director of the Southeastern Association of State Highway Officials, was read, in which he invited the L.E.S. to attend their forthcoming convention and requested that announcement of same be made to the membership. It was agreed to extend the invitation at the Society's general meeting immediately following the board meeting.

Letters from Mr. Charles E. Doerler, Secretary, Louisiana Safety Committee, requesting that the Society permit its name to be used as a sponsor for the coming Louisiana Safety Conference, and from Commissioner Bernard J. McCloskey, requesting that other local engineering groups be contacted with reference to the conference, Mr. Abrahm moved that both requests be complied with, seconded by Mr. Macdonald and carried.

Mr. Macdonald moved that Mr. J. D. Smith be dropped from the rolls in accordance with his request, seconded by Mr. Duclos and carried.

President McNiven appointed Mr. Edwin L. Dennis to chair a committee of his own choice to write a memorial resolution honoring the late T. Clyde Beatty.

Correspondence from the United Fund for Greater New Orleans and the National Society of Professional Engineers was read, and the secretary was instructed to answer same.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Louisiana Engineering Society Held Jointly with the N. O. Section, American Institute of Chemical Engineers, Monday, Oct. 13, 1952

The meeting was called to order by President McNiven with approximately 125 members and guests present. Mr. McNiven welcomed members and guests of AIChE.

Regular business was dispensed with in order to shorten the meeting, and President McNiven then presented Mr. Robert Gunnaer, Technical Assistant to the Vice-President, Pan-Am Southern Corp., New Orleans, who gave a brief talk on Oil Progress Week in Louisiana. Following this the chair was relinquished to Mr. Leon Godchaux, Chairman, N. O. Section, AIChE, who introduced the main speakers of the evening, Messrs. G. J. Forney, Project Manager, American Cyanamid Co., and J. W. Hamilton, Resident Manager Chemical Construction Corp., who presented a joint lecture on "General factors Concerning the American Cyanamid Nitrogen Products Plant Constructed Near New Orleans".

Following Mr. Hamilton's remarks it was announced that motion pictures of a plant recently constructed in India, very similar to that now under construction at New Orleans, would be shown after the meeting.

The chair then relinquished to President McNiven, who closed the session with a rising vote of thanks to the speakers. A television set then was turned on to allow those present to hear an address being made in New Orleans by presidential candidate Dwight Eisenhower. Following this the movie of cyanide plant in India was shown.

JOHN P. FERNANDEZ, Secretary-Treasurer

**Minutes of Regular Meeting of the Society Held Jointly with the
Illuminating Engineering Society, Monday, Nov. 10, 1952**

The meeting was called to order by Acting President Abraham with approximately 60 members and guests present. Mr. Abraham welcomed members and guests of I.E.S.

Mr. Sydney Ellis moved that the reading of minutes of the preceding meeting be dispensed with, seconded by Mr. J. S. Vogt and carried, whereupon the secretary read minutes of a meeting of the Board of Direction held in October.

Acting President Abraham called attention to the notation on meeting notices regarding the Nominating Committee and urged all members to submit their suggestions to the committee as soon as possible.

Dr. Arthur Nuhrah of Tulane University gave a short talk in behalf of the United Fund campaign.

Mr. R. Mallard Seago then read a memorial resolution honoring the late esteemed member, A. B. Paterson, after which a moment of silence was observed in his memory.

The chair then was relinquished to Mr. H. S. Gregory, Chairman, I. E. S., who called on the chairman of his Technical Paper Committee to introduce the speaker of the evening, Mrs. Mabel L. Hebert, President, Nu-Lite, Inc., who gave a most interesting demonstration on illumination in the home, entitled "The Life of Light".

The chair then was returned to Acting President Abraham, 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 Monday, Nov. 10, 1952

The meeting was called to order by Acting President Abraham, with Messrs. Macdonald, Molaison, Myers, Seago, Sessums and Fernandez present. Mr. Macdonald moved that minutes of the preceding meeting be accepted as read, seconded by Mr. Sessums and carried.

The secretary reported on the progress of plans for the annual meeting and announced that the Technical Paper Committee had requested that the technical sessions of the meeting be presided over by members of the L.E.S. It was then decided that Messrs. C. Glennon Melville, Chairman, Technical Paper Committee, would preside at one, and that board members F. W. Macdonald, R. T. Sessums and Wayne P. Wallace would handle the others.

Mr. Sessums moved that Mr. Lewis B. Gay be reinstated to full membership in the Society, seconded by Mr. Seago and carried.

A letter from the Federal Defense Administration, Dallas Regional Office, was read. Mr. Sessums moved that Mr. Abraham handle the matter at his discretion after consultation with Mr. Paul Ristroph, Civil Defense Director for New Orleans. The motion was seconded by Mr. Molaison and carried.

Discussion followed concerning honors and awards, and it was decided that Messrs. Lester F. Alexander and Reinhard A. Steinmayer would be invited to present the Civic Activities Medal, and that Mr. James M. Todd would be asked to present the Technological Accomplishment Medal.

The matter of appointees to write memorials for deceased members was discussed, and it was decided that state sections should appoint their own committees to handle this matter for local decedents.

A communication from Mrs. J. M. Gondran, submitting the resignation of her husband who is critically ill, was read. The secretary reported that Mr. Gondran had been a member in good standing for 29 years and would become eligible for life membership at the end of 1953. Mr. Molaison then moved that the board decline to accept Mr. Gondran's resignation and that his dues for 1953 be waived. Motion seconded by Mr. Myers and carried.

Upon the recommendation of the board, Mr. David W. Stewart was appointed to act as Master of Ceremonies for Presidents' Night to be held in December.

Mr. Macdonald moved that an annual award be set up in the form of a certificate of appreciation for outstanding service rendered by a member of the society during the year. The motion was seconded by Mr. Molaison and carried. Mr. Macdonald then moved that the first certificate be presented to Mr. Lionel Cucullu for his excellent work on the Vocational Guidance Committee as well as other assignments. The motion was seconded by Mr. Sessums and passed unanimously.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Society Held on December 8, 1952

The meeting was called to order by Acting President Abrahm, with approximately 90 members and guests present. Mr. S. P. Koltun moved that the reading of minutes of the preceding meeting be dispensed with, seconded by Mr. R. F. Muller and carried. The secretary then read minutes of a meeting of the Board of Direction held in November.

Mr. David W. Stewart, former president of the Society, then introduced all of the other presidents in attendance. When it became known that former presidents Douglas S. Anderson, Donald Derickson, and Bernard H. Grehan were unable to attend because of illness, Mr. Wm. J. Drawe, Jr., moved that a letter be addressed to each expressing the Society's regret that they could not be present and best wishes for their speedy recovery. The motion was seconded by Mr. B. P. Babin and carried.

Mr. Wm. H. Rhodes of the Nominating Committee then read the committee's report as follows:

For President	Michael C. Abrahm
For Vice-President	Frank W. Macdonald
For Second Vice-President	R. Mallard Seago
For Secretary-Treasurer	John P. Fernandez
For Director, 2 Years	Waldemar S. Nelson
For Director, 2 Years	Claude J. Kelly
For Director, 1 Year	Claiborne Perrilliat

Mr. James M. Todd then moved that the committee's recommendations be accepted and the names placed on the ballot, seconded by Mr. Leake and carried. Acting President Abrahm then called for nominations from the floor. When none were offered, Mr. Clayton L. Nairne moved that the nominations be closed, seconded by Mr. Olsen and carried.

Mr. Geo. Elmer May then introduced the main speaker of the evening Mr. Charles G. Arps of Allis-Chalmers Mfg. Co., Milwaukee, who gave a most interesting address entitled "The Personal Equation".

Following the lecture, Mr. Abrahm thanked the speaker in behalf of the Society and the meeting adjourned with a rising round of applause from the audience.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Board of Direction Held on Monday, Dec. 8, 1952

The meeting was called to order by Vice-President Abrahm, with Messrs. Macdonald, Myers, Molaison, Sessums, Wallace and Fernandez present. Minutes of the preceding meeting were read and accepted upon motion by Mr. Sessums, seconded by Mr. Molaison and carried.

The secretary reported that the Nominating Committee had met in accordance with the constitution and submitted the following slate of nominees for the December election:

For President	Michael C. Abrahm
For Vice-President	Frank W. Macdonald
For Second Vice-President	R. Mallard Seago
For Secretary-Treasurer	John P. Fernandez
For Director, 2 Years	Waldemar S. Nelson
For Director, 2 Years	Claude J. Kelly
For Director, 1 Year	Claiborne Perrilliat

A communication from the New Orleans Section, A.S.R.E., requesting permission to participate in the Society's Vocational Guidance Program, was read. Mr. Molaison moved that they be invited to join in this work, seconded by Mr. Macdonald and carried.

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A communication from Mr. Hugh O. Bourque, requesting that he be dropped from the membership roll, was read. Mr. Macdonald moved that this be done, seconded by Mr. Molaison and carried.

Since the following student members, now graduated, have not acknowledged notification of their transfer to junior membership, Mr. Sessums moved that they be considered as having resigned in accordance with the constitution; motion seconded by Mr. Myers and carried:

S. A. Callahan, Jr., Ralph E. Cooper, Hugh P. Hebert, Jorge Joy, Floyd T. Langlois, Tom Owen, and James B. Starr.

A reply written by Mr. Abraham to a communication from the Federal Civil Defense Administration was read.

Mr. Sessums moved that Mr. L. V. O'Connor be dropped from the roll for non-payment of dues and because of unknown address, seconded by Mr. Molaison and carried.

Upon the recommendation to the Board, Acting President Abraham appointed Messrs. George D. Waddill and Richard N. Graham to prepare an obituary for late member, Grover C. Rackerby.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Board of Direction Held on Thursday, Jan. 8, 1953

The meeting was called to order by President McNiven with Messrs. Abraham, Bonnet, Macdonald, Molaison, Richardson, Seago, Sessums, Sicks, Wallace and Fernandez present. Minutes of the preceding meeting were accepted as read.

The secretary reported that all applicants for membership listed in the December ballot had been elected to their respective grades. He also read the treasurer's report for 1952, a copy of which is attached to minutes of the Annual Meeting.

A letter from the Engineers' Club of Milwaukee requesting exchange of publications was read. Mr. Macdonald moved that their request be granted, seconded by Mr. Wallace and carried.

Notes of thanks for floral offerings from the Grehan, Kraus and Seago families were read.

Mr. Seago moved that resignations of the following be accepted with regret, seconded by Mr. Molaison and carried:

James C. Harris, John H. Janssen, Richard E. Ruckstuhl, and Edmund B. Martin.

Upon the recommendation of the board, President McNiven appointed Messrs. B. M. Dornblatt, C. M. Kerr, and F. N. Billingsley, Chairman, to serve as a committee to prepare a memorial resolution in honor of the late Bernard H. Grehan, deceased life member and former president of the Society. In like manner, Messrs. Arthur J. Naquin and R. W. Ziifle were appointed to perform the same service for the late Gus C. Kraus.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Annual Meeting of the L. E. S. Held on Thursday, Jan. 8, 1952

The meeting was called to order by President McNiven in the Claiborne Room, St. Charles Hotel, with approximately 130 members and guests present. Dr. John S. Land, Minister, St. Charles Avenue Presbyterian Church, gave the invocation, after which the president welcomed those present. Mr. Chas. P. Knost moved that reading of minutes be dispensed with, seconded by Mr. Wm. Drawe, Jr., and carried. President McNiven then introduced the presidents of the Society's state sections:

Mr. Hu B. Myers, Alexandria Section
Mr. Henry L. Landry, Baton Rouge Section
Mr. Thomas A. Bonnet, Lafayette Section
Mr. William M. Davis, Lake Charles Section
Mr. John T. Folk, Monroe Section (absent)
Mr. Ernest M. Gillen, Shreveport Section (absent)

The president then introduced the key-note speaker, Mr. Gerald A. Newman, Consul of Canada and Trade Commissioner. Before making his address, Mr. Newman read a greeting and commendation from the Right Honorable Clarence D. Howe, Minister of Trade and Commerce of Canada, directed to President McNiven. He then spoke on "The Engineer and a Nation's Progress", which was acclaimed with a rising vote of thanks from the audience.

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

Mr. Frank W. Macdonald presented three resolutions, copies of which are attached to these minutes, and moved that they be accepted. The motion was seconded by Mr. D. W. Stewart and carried.

Certificates of Merit were awarded to the following students who presented papers at the Student Conference:

R. A. Eubanks, Louisiana Polytechnic Institute, "Reclaiming Used Lubricating Oil."

John C. Langford, Louisiana State University, "Spraberry—An Appraisal."

Edward Meaux, Southwestern Louisiana Institute, "Hydrogen Blistering—A Form of Corrosion."

John M. Koffskey, Tulane University, "Application of Gas Turbines to Aircraft Propulsion."

Certificates of Life Membership were presented to the following who have been active members of the Society for 30 years: Theo. T. Chenet, C. A. Ives, Jr., C. Leonard Jones, Randall F. Legeai, Solis Seiferth.

President McNiven then requested Mr. Macdonald to escort Mr. Lionel J. Cucullu to the rostrum, and presented Mr. Cucullu with a Certificate of Appreciation for his faithful and unselfish service to the Society.

Mr. William H. Rhodes of the Nominating Committee then presented the teller's report and requested the following gentlemen to escort the newly elected officers to the rostrum:

Mr. W. Stone Leake, escorting Professor Wayne P. Wallace, incumbent board member.

Mr. R. A. Steinmayer, escorting Mr. Claiborne Perrilliat, newly elected board member.

Mr. Chas. M. Kerr, escorting Mr. Claude Kelly, newly elected board member.

Mr. John L. Porter, escorting Mr. Waldemar S. Nelson, newly elected board member.

Mr. James M. Todd, escorting Mr. John P. Fernandez, re-elected Secretary-Treasurer.

Mr. David W. Stewart, escorting Mr. R. Mallard Seago, Second Vice-President.

Mr. Frederick H. Fox, escorting Mr. Frank W. Macdonald, First Vice-President.

Mr. Clayton L. Nairne, escorting Mr. Michael C. Abraham, President.

Retiring President McNiven then handed the gavel to President-Elect Abraham, who accepted the office and gave a brief outline of plans for the coming year, after which Mr. Muller moved that the meeting be adjourned, seconded by Mr. Taylor and carried.

JOHN P. FERNANDEZ, Secretary-Treasurer

"WHEREAS, the Chrysler Corporation, in the spirit of cooperation, has kindly offered its plant for inspection during this annual meeting, and

"WHEREAS, this inspection trip will give the members and guests a better insight into the workings of the afore said plant,

"BE IT RESOLVED that the Louisiana Engineering Society extend to the Chrysler Corporation 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 that a copy be sent to the Chrysler Corporation."

. . .

"WHEREAS, the Board of Commissioners of the Port of New Orleans, through its Chief Engineer, Mr. John A. McNiven, is so generous in furnishing the yacht "Good Neighbor" for the members and guests of the 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; therefore

"BE IT RESOLVED that the Louisiana Engineering Society extend to the Board of Commissioners of the Port of New Orleans its sincere thanks and appreciation for these courtesies, and

"BE IT FURTHER RESOLVED that this resolution be incorporated in the

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minutes of the Society and that a copy be sent to the Board of Commissioners of the Port of New Orleans."

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

"WHEREAS, these services and courtesies have provided a meeting place for the annual meeting, monthly meetings, and the headquarters of the Society throughout the years; therefore,

BE IT RESOLVED that the Louisiana Engineering Society extend to our hosts our thanks and sincerest appreciation for services beyond their duty, and

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

FINANCIAL REPORT OF THE SECRETARY-TREASURER FOR THE YEAR 1952

INCOME:

Annual Meeting	\$2,671.80	
Annual Outing	665.72	
Advertising	657.95	
Certificates	35.00	
Dividends and Interest	244.31	
Dues Received	8,254.25	
Monthly Meetings	240.42	
Postage Refund	32.00	
Proceedings, Sale of	6.45	
Income from Frozen Assets	95.91	
Total		\$12,903.81

EXPENDITURES:

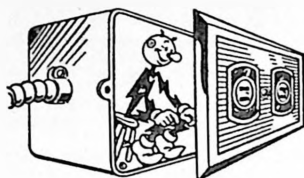
Annual Meeting	\$2,815.83	
Annual Outing	821.60	
Certificates	18.85	
Dues Rebates	1,555.25	
Floral Offerings	26.15	
Library Porter Service	48.00	
Auditor's Fee	140.00	
Miscellaneous	340.68	
Monthly Meetings	672.79	
Proceedings, Cost of	2,101.74	
Salaries	2,400.00	
Stationery, Printing and Postage	1,235.15	
Taxes	39.75	
Capital Account	44.92	
Total		\$12,260.71

Increase in Liquid Assets during the Year \$ 643.10

STATEMENTS OF ASSETS

DECEMBER 31, 1952

Cash, Whitney National Bank Checking Account		\$ 3,770.27
U. S. Savings Bonds, Series F:		
1942	\$ 929.00	
1943	914.00	
1945	861.00	
1946	835.00	
1950	1,508.00	5,047.00
Homestead Investments:		
Columbia Homestead Association	372.41	
Commonwealth Bldg. & Loan Association	306.52	
Greater N. O. Homestead Association	1,806.65	
Security Bldg. and Loan Association	500.00	
Sixth District Bldg. and Loan Association	500.00	
Union Savings and Loan Association	500.00	3,985.58
Total Assets December 31, 1952		\$12,802.85
Total Assets January 1, 1952		12,159.75
Increase during the Year		\$ 643.10



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NEW ORLEANS

1952 MEMBERSHIP REPORT

GAINS:

Members Elected:

Members	54	
Juniors	42	
Affiliates	9	
Students	1	106

Members Reinstated:

Members	4	
Affiliates	1	5

Total 111

LOSSES:

Life Members Deceased 3

Members:

Deceased	6	
Resigned	12	
Dropped	22	40

Affiliates:

Deceased	1	
Dropped	4	5

Juniors:

Resigned	6	
Dropped	19	25

Students:

Resigned	19	92
----------	----	----

Net Gain 19

TRANSFERS:

Member to Honorary Member	1
Member to Life Member	6
Affiliate to Member	2
Junior to Member	5
Student to Junior	13

SUMMARY

Charter Members	1
Honorary Members	7
Life Members	63
Members	945
Affiliate Members	70
Junior Members	382
Student Members	1

1,469

Minutes of Meeting of the Board of Direction, Contact Representatives and State Section Officers Held on Friday, Jan. 9, 1953 at Arnaud's Restaurant

The meeting was called to order by President Abraham with Messrs. Barron, Cucullu, Davis, Drawe, Hadra, Innes, Landry, Lassalle, Macdonald, McNevin, Molaison, Mayers, Nelson, Perrilliat, Poole, Richardson, Ricketts, Seago, Sessums, Sicks, Wallace, Watts, zur Burg, and Fernandez present.

Minutes of the meeting held in 1952 were read, whereupon Messrs. Richardson, Watts and Sessums stated that Ruston members did not object to the title "Monroe Section" for the section covering their area.

Mr. Seago then gave a report of his committee on sectional boundaries, which included the following recommendations:

1. Prepare a mimeographed form to be mailed to each member of the Society along with a letter of explanation. This form would list each section with a check square to indicate the member's preference with regard to section affiliation. Space would be provided for those members not desiring to affiliate with any particular section.

2. Dues remittance to the sections would be on the basis of each section's membership obtained as a result of the survey. Dues remittance for those members not desiring to affiliate with any particular section, would be to the section having headquarters closest, in air-line miles, to the member's residence.

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Badger Meter Mfg. Company	Keasbey & Mattison Co.
Bethlehem Steel Corp. (Wire Rope)	Kerotest Manufacturing Co.
Bristol Company	Kieley & Mueller, Inc.
Buda Company	Wm. F. Klemp Company
Carboloy Department of General Electric Co.	E. J. Lavino & Company
Celfor Tool Company	Mercoide Corporation
Clark Manufacturing Co.	Merrill Brothers
Climax Engineering Co.	Moeller Instrument Company
Cooper Alloy Foundry Co.	Moisture Register Company
Corning Glass Works	Morehead Manufacturing Co.
Crane Company	New York Belting & Packing Co.
Crosby Steam Gate & Valve Co.	Nordstrom Valve Division
The Dayton Rubber Company	Okonite Company
DeVilbiss Company	Robbins & Myers, Inc.
Durant Manufacturing Co.	Rockwell Manufacturing Co.
Eagle Iron Works	Taylor-Wharton Iron & Steel Company
Ford Meter Box Company	Trane Company
Foster Engineering Co.	Tube Turns, Inc.
General Controls Company	Union Gear & Sprocket Co.
Globe Steel Tubes Co.	Weston Electrical Instrument Co.
Goddard & Goddard Co.	Wright Hoist Division
	John Zink Company

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3. Each section would be furnished a list of members desiring affiliation with that section.

Mr. Seago moved that these recommendations be accepted, seconded by Mr. Davis and carried.

Mr. Hadra stated that, because the L.E.S. membership is composed of divers branches of engineering it is difficult to obtain a program that attracts all types of engineers. Mr. Drawe stated he had faced a similar problem with the annual meeting program, but believed the papers selected were of general rather than specialized interest.

Mr. Richardson state that his section faced a problem brought about by the election of officers taking place on December 1, while dues are payable October 1, the result being that one administration must bill dues which another collects. We therefore moved that the date for billing Monroe members as set forth in their constitution be changed from October 1 to January 1. The motion was seconded by Mr. Molaison and carried.

Mr. Richardson further stated that the Monroe Section had difficulty collecting local dues and suggested that the general secretary take over this collection. The secretary advised that he did not object to collecting dues for state sections provided all sections would levy the same amount of dues, payable at the same time. He also pointed out that the Monroe Section was the only one presently levying local dues. Other sections declared themselves not sympathetic to the idea of collecting additional dues. Baton Rouge representatives suggested that rather than levy local dues it would be preferable to cut down expenses on refreshments or assess those who attend the section's functions.

Messrs .Myers, Landry, Sicks and zur Burg gave an outline of their technical paper programs.

Mr. Cucullu reported that the Vocational Guidance Committee had been very active during the year and that over 4000 high school students had been contacted. He stated that after its first year he believed the committee would be in a better position to stress quality instead of quantity of students entering engineering schools, pointing out that quantity had been stressed the first year because of the tremendous deficiency in both graduate engineers and technicians, and those who do not qualify for engineering degrees could go into drafting and other allied work.

President Abrahm then announced that he hoped his administration would see a closer coordination between sections, and with this in mind Mr. Sessums would be appointed chairman of a Section Coordination Committee. He hoped also that the Board of Direction could meet once during the year in each locality and that officers of local sections would attend half of the parent organization's meetings; also that adjacent sections would plan to hold joint meetings. With this in mind he requested each section to appoint one member to the committee headed by Mr. Sessums.

Mr. Davis inquired whether the Society had an emblem for personal wear. The secretary advised that there had been one prior to World War II, but that the Society had discontinued keeping them in stock, an objection being that the pin was too large. He stated that a local representative of a jewelry company was anxious to design a new emblem and if enough interest were shown this could be done.

President Abrahm announced that on February 9 the first state-wide telephone hook-up meeting would be held.

In order to get the Society's business under way for 1953, Mr. Nelson moved that Mr. Arthur H. Hill be appointed Editor of the Proceeding for the year, seconded by Mr. Wallace and carried. Mr. Perrilliat moved that the President and the Treasurer be authorized to sign checks and have access to the safe deposit box, seconded by Mr. Nelson and carried. Mr. Perrilliat moved that the President and the Treasurer be authorized to sign checks and have access to the safe deposit box, seconded by Mr. Nelson and carried. Mr. Wallace moved that the First Vice-President, Retiring President and Treasurer be appointed to the Finance Committee, seconded by Mr. Hadra and carried.

Mr. Landry moved that the new committee appointed to coordinate section activities replace the District Contact Representatives who were appointed in the past, since the purpose of each was similar. The motion was seconded by Mr. Davis and carried.

President Abrahm appointed Professor R. A. Steinmayer to be the Society's representative to the Chamber of Commerce, and the meeting adjourned with a rising vote of thanks to Mr. Wm. J. Drawe, Jr., General Chairman of the Annual Meeting.

JOHN P. FERNANDEZ, Secretary-Treasurer

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**Minutes Alexandria Section Louisiana Engineering Society
November 28, 1952**

Dinner was served before the meeting.

The meeting was opened, Mr. O. E. Barron, Secretary-Treasurer, presiding. The President and Vice-President were both absent.

Mr. Cresap read the minutes of the last meeting by request of Mr. Barron.

Mr. Roland offered motion that minutes be adopted as read. Passed unanimously.

Mr. Barron gave a short report on the proposed State-Wide Hook-up. Mr. Cresap read a letter from Mr. Abrahms giving information as to costs of the hookup. The letter requested that the Alexandria Section give notice as to whether or not they will participate in the first Forum Meeting on February 9, 1953.

Mr. Gibson offered a motion that the Alexandria Section accept the invitation to participate in the first Forum. This was seconded by Roland and passed unanimously.

Mr. Barron gave a financial report which showed that the Alexandria Section has a balance on hand of \$273.32.

Mr. Cresap gave the Nominating Committee's Report as follows:

Mr. Erwin Hogge for President; Mr. Charles R. Westerchil for Vice-President, and Mr. C. C. Edwards for Secretary-Treasurer.

Mr. Gibson made the motion that these nominations be accepted. Seconded by Mr. L'Meureux.

Floor nominations were called for, but there were none.

Mr. Barron appointed as Tellers to count the votes, Bill Roland, Bill Keating, and Howard L'Meureux.

It was announced that ballots would be sent out to all members.

Mrs. W. D. Roland, President of the Ladies Auxiliary, came in to make an announcement about the Christmas Party. It will be a dinner-dance at the Serameric Club, December 11, 1952. The cost will be \$2.25 per plate. Guests are invited but reservations must be in a week in advance.

Mr. Roland made the motion that the next regular meeting be held just before the Supper-Dance, December 11, 1952. Seconded by Mr. Hogge.

Mr. Roland then offered the motion that the Secretary-Treasurer be authorized to draw up a resolution that the by-laws be revised to permit the executive committee set the day of the month for the regular meeting. This day to be used for all monthly meetings throughout the year. Mr. Hogge seconded the motion. This will be done and put to a vote of the entire Alexandria Section.

Mr. Melancon introduced the speaker of the evening, Mr. R. L. Calhoun.

Mr. Calhoun gave a very interesting talk on Coaxial Cables.

After a discussion and question period, the meeting was adjourned by Mr. Barron.

O. E. BARRON, Secretary-Treasurer

Minutes Alexandria Section Louisiana Engineering Society, January 22, 1953

The meeting was called to order by the outgoing President, Mr. Hu B. Myers.

The new officers for 1953 were installed and are as follows: Mr. Erwin Hogge, President; Mr. Charles R. Westerchil, Vice-President, and Mr. Newton Himel, Secretary-Treasurer.

Mr. Hogge, the new President, gave an acceptance speech and stated that the main objective for 1953 would be to promote the betterment of the Club.

Mr. O. E. Barron reenumerated the activities of the year 1952, naming the officers and committee chairmen for the past year.

Mr. Hogge appointed Messrs. Soule Butler and Tom David to the executive Committee, but held up on other appointments until he could consult the roster.

Mr. Tom David reported on the Network Loud Speaker Forum to be held on February 9, 1953 at 8:30 p. m. in the Community Center. Mr. O. E. Barron reported that Bell Telephone is handling the hook-up at the Community Center and that the Auxiliary will help at the meeting.

The second Thursday of the month has been set as the regular meeting night.

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Upon motion by Mr. O. E. Barron, and unanimously approved, the Secretary was authorized to send letters of appreciation to Honor workers and the outgoing officers of 1952.

There being no further business, the meeting was adjourned.

NEWTON HIMEL, Secretary

Minutes of the Meeting of the Baton Rouge Section of the Louisiana Engineering Society June 21, 1952

The June meeting of the Baton Rouge Section of the Louisiana Engineering Society for the year 1952 was held jointly with the parent organization on June 21 at Harry Cloud's Camp in Baton Rouge.

The horseshoe pitching contest held in the afternoon was a very lively affair with everyone participating.

At the supper, following the afternoon entertainment, a short business session was held at which time the many out of town guests were introduced. The prizes for the horseshoe pitching were presented as well as the many attendance prizes.

WILEY D. POOLE, Secretary-Treasurer

Minutes of the Meeting of the Baton Rouge Section of the Louisiana Engineering Society September 10, 1952

The September meeting of the Baton Rouge Section of the Louisiana Engineering Society for the year 1952 was held on September 10, 1952 in the auditorium of the Gulf States Utilities Building.

The meeting was called to order by the President, Mr. Louis Duclos.

A motion was made and seconded to dispense with the reading of the minutes of the previous meeting. There being no old or new business, Mr. Duclos called on Mr. Ted Innes to introduce the speaker of the evening. Mr. Innes introduced Mr. Paul R. Oakes, Assistant Superintendent of Delta Tank Company, who rendered a most interesting talk on "The Gamma-Ray Machine and Its Application in Industry." After a very informative discussion period, the meeting adjourned and refreshments were served.

WILEY D. POOLE, Secretary-Treasurer

Minutes of the Meeting of the Baton Rouge Section of the Louisiana Engineering Society October 9, 1952

The October meeting of the Baton Rouge Section of the Louisiana Engineering Society for the year 1952 was held jointly with the Baton Rouge Sub-section of the American Institute of Electrical Engineers on October 9, at 7:30 p. m. The meeting was held in the auditorium of the Gulf States Utilities Building on Government Street.

The meeting was called to order by President Duclos who dispensed with the reading of the minutes of the last meeting. There being no old or new business, the officers of the AIEE were called upon to hold their business meeting and introduced the speaker for the evening. The officers of the AIEE did not hold any business meeting and moved on to the introduction of the speaker, Mr. Austin Mary, Distribution Planning Supervisor, Gulf Utilities Company. Mr. Mary spoke on "The Prospects of Generation of Electricity Through the Use of Atomic Energy."

Meeting adjourned and refreshments were served.

WILEY D. POOLE, Secretary-Treasurer

Minutes of the Meeting of the Baton Rouge Section of the Louisiana Engineering Society November 6, 1952

The November meeting of the Baton Rouge Section of the Louisiana Engineering Society for the year 1952 was held on November 6, 1952 in the Agricultural Engineering Auditorium on the L.S.U. Campus.

The meeting was called to order by President Duclos. A motion was made and recorded to dispense with the reading of the minutes of the previous meeting. Mr. Duclos announced that the December meeting would be a dinner meeting and will be a joint meeting with the Women's Auxiliary. There being no further business, Mr. Duclos called on Mr. A. N. Gordon to introduce the speaker for the evening. Mr. Gordon introduced Mr. J. E. McKay, manager of sales promotion for the Fluor Corporation, who spoke on the roll of engineering and construction companies in modern engineering work.

Meeting adjourned and refreshments were served.

WILEY D. POOLE, Secretary-Treasurer

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Minutes of the Meeting of the Baton Rouge Section of the Louisiana Engineering Society February 9, 1953

The first meeting of the Baton Rouge Section of the Louisiana Engineering Society for the year 1953 was held on February 9, 1953, in the auditorium of the Agricultural Engineering Building on the campus of Louisiana State University.

In the absence of President H. L. Landry, the meeting was called to order by 1st Vice-President T. J. Innes. The Baton Rouge Section, together with the other State sections, was connected by a state-wide telephone hook-up for a panel discussion on "Engineers in Education." The members of the panel at Baton Rouge were:

Dean Leo J. Lassalle, Dean of College of Engineering, Louisiana State University; Mr. Charles Leet, Assistant General Manager, Esso Standard Oil Company; Lt. Gen. Troy H. Middleton, President, Louisiana State University.

The Past President of the Baton Rouge Section, Louis Duclos, acted as moderator.

Upon adjournment of the meeting, refreshments were served.

R. B. NERF, Secretary-Treasurer

Minutes of the November Meeting of the Lafayette Section of Louisiana Engineering Society

The meeting was called to order by the President, Mr. Allen T. Bonnet. The minutes were then read by the Secretary and approved as read.

Discussion then followed on the proposed long distance telephone hook-up and the group agreed to go along with the parent organization on February 9, 1953.

A short speech was given by Mr. A. M. Bujard, past president of the group, as an introduction to the film, "Map of an Empire." Mr. Bujard then introduced Mr. Homer Robinson, Head of the Personnel Department of United Gas, and Mr. E. L. Moore, Sales Supervisor, each of whom spoke a few words. The film, which showed industrial development in Louisiana and other gulf states, was then shown.

The meeting was then adjourned and refreshments were served.

EMERY DOMINGUE, Secretary-Treasurer

Minutes of the December Meeting of the Lafayette Section of the Louisiana Engineering Society

The meeting was called to order by the President, Mr. Allen Bonnet, in the auditorium of the F. M. Hamilton Training School.

Mr. Bonnet then introduced the officers of L.E.S. and Mr. Gus Vogler introduced those of N. A. C. E.

Mr. Vogler gave a short introduction on the film and made a few comments about the N. A. C. E. group.

The film, "Corrosion in Action", was then shown.

Mr. Vogler invited the L.E.S. members to attend their meetings.

The meeting was then adjourned and refreshments were served.

EMERY DOMINGUE, Secretary-Treasurer

Minutes of the January Meeting of the Louisiana Engineering Society Lafayette Section

The meeting was called to order by President Bonnet in the Auditorium of the F. M. Hamilton Training School and he then welcomed the guests present.

The meeting was then turned over to Dean F. W. zur Burg who introduced the guest speaker, Mr. Gibson Morris, Chief Engineer, for the Engineering Division of the Oak Ridge National Laboratory.

Mr. Morris gave a most interesting speech on "The relationship of Engineering work and Atomic energy. He discussed the many problems that the engineer must overcome in this field. He said that atomic energy work has proved one thing: "Give the Engineer the basic know how and he can transcend the fields."

Following his speech, Mr. Morris showed a short film entitled "Engineering for Radio Isotopes.

After a question and answer period the meeting was adjourned.

EMERY DOMINGUE, Secretary-Treasurer

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**Minutes of Meeting of the Monroe Section Louisiana Engineering Society
December 9, 1952**

The Monroe Section of the Louisiana Engineering Society met in the Cameo Room of the Virginia Hotel, Monroe, Louisiana, December 9, 1952, at 7:30 p. m. The meeting was called to order and the guests were introduced.

Information was presented concerning the Vocational Guidance Program for high school students, as implemented by the Engineers Council for Professional Development. It was generally agreed that members of the Society would cooperate in contacting the high school students in the discussion of engineering as a career.

Mr. Harry Richardson and Mr. Glen Lee Corrigan had attended a meeting to discuss a panel of "Engineers in Education" to be held on February 9, 1953, at 8 p. m. This is being sponsored by the New Orleans Section. Those sections of LES near Engineering Schools will prepare a panel, and all of these will be interconnected by a telephone system.

These four interconnected panels will simultaneously discuss "Engineers in Education." The panel for the Monroe Section will be held in the Ballroom of the Virginia Hotel. Mr. Richardson and Dean Ben T. Bogard are to attend the meeting in New Orleans in January to assist in preparation of details for this panel. All members will be notified as developments for this panel are prepared.

Mr. A. D. Williams, Chairman of the Nominating Committee, presented the following nominees for offices for the coming year: President, Mr. J. T. Folk; 1st Vice-President, Mr. C. M. Dunlap; 2nd Vice-President, Mr. W. B. Jordan; Secretary-Treasurer, Mr. A. P. Andrews. There were no other nominees and these were elected by the members present.

Mr. John H. Huffman of United Gas presented a most interesting movie depicting industry and industrial potentialities of the South.

No further business was presented and the meeting was adjourned for the refreshments and fellowship portion of the meeting.

**Minutes of Meeting of the Monroe Section Louisiana Engineering Society
February 9, 1953**

The Monroe Section of the Louisiana Engineering Society met in the Cameo Room of the Virginia Hotel, Monroe, Louisiana, February 9, 1953 at 7:30 p. m. The meeting was called to order by the President, Mr. J. T. Folk, Sr.

A brief business meeting was held at which time President Folk announced names of officers and committee members as follows:

OFFICERS—J. T. Folk, Sr., President; W. B. Jordan, Vice-President; C. M. Dunlap, Vice-President; A. P. Andrews, Secretary-Treasurer.

EXECUTIVE COMMITTEE—J. T. Folk, Sr., President; W. B. Jordan, Vice-President; C. M. Dunlap, Vice-President; A. P. Andrews, Secretary-Treasurer; Harry D. Richardson, President, 1952; H. M. James, President, 1951.

CHARTER AND RULES COMMITTEE—Ben T. Bogard, Chairman.

ENTERTAINMENT AND PROGRAM COMMITTEE—H. M. James, Chairman; D. X. Ellett, F. E. Hogan.

PUBLICITY COMMITTEE—Harry D. Richardson, Chairman; Thomas R. Henry, Jr., J. B. Petty.

MEMBERSHIP COMMITTEE—Farrel W. Adams, Chairman; R. L. Phillips, Sr., Sidney S. Gill, H. M. Messinger, Thurman C. Morgan, J. G. Chumley, Cecil W. Biggs.

A discussion relative to increasing our membership was held. It was decided that Application for Membership forms would be sent to all present members in the Monroe Section requesting them to assist in obtaining additional members.

It was announced that the next meeting would be held at Ruston on March 3rd. There being no further business the meeting was adjourned to listen to the state-wide panel discussion on "Engineers in Education" via state-wide telephone hook-up and loud speaker system.

On the Monroe panel were Dean Ben T. Bogard of the Louisiana Tech school of engineering, Mr. J. T. Folk, Sr., professor of civil engineering at Louisiana Tech, and Dean W. R. Woolrich of the school of engineering at the University of Texas.

**Minutes of Meeting of the Shreveport Section of the Louisiana Engineering Society
December 9, 1952**

This meeting was held in the Hostess Room of the Continental Baking Company and was called to order by President Roeger at 7:30 p. m.



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The minutes of the September meeting were read by the Secretary, with one correction they were approved as read.

The president called on Mr. Carl Hadra, Chairman of the Nominating Committee, for his report. Carl announced that after due consideration his committee wished to nominate the following for officers for the Society for the year 1953: President, Mr. E. M. Gillen; First Vice-President, Mr. Carl Hadra; Second Vice-President, Mr. E. C. Mishou; Secretary-Treasurer, Mr. Millard P. Snyder. The President then asked for nominations from the floor. It was moved and seconded that the above nominees be unanimously elected. There being no negative votes, it was so ordered.

The President appointed a committee composed of T. F. Cash, A. J. Shoup, and Carl Hadra, to prepare a memorial resolution honoring Mr. E. Lee Jones, a member of our Society who had died on October 8, 1952. Mr. Cash is chairman of this committee.

There being no further business, the meeting was then turned over to Mr. Robin Hood, the program chairman. The program consisted of some discussions of the contemplated building program for the Caddo Parish School System. Mr. Hood introduced Mr. Roscoe White, Superintendent of the Caddo Parish Schools. Mr. White outlined the general program and then called upon two of his assistants to elaborate on their particular phase of the program. Mr. C. L. Perry discussed briefly the business and financial aspect of the program and Mr. Lloyd Waite, with the assistance of numerous charts showed how the building requirements were being forecast for the future.

This was a most interesting and informative program.

Light refreshments of coffee and cup cakes were served to about forty members and guests.

W. W. ALSUP, Secretary-Treasurer

Minutes of Meeting of the Shreveport Section of the Louisiana Engineering Society January 5, 1953

The meeting was held in the dining room of Monsour's Restaurant and was called to order by retiring President Roeger at 6:30 p. m.

The minutes of the meeting held December 9, 1952 were read by the retiring Secretary Alsup. There being no discussion or corrections, the minutes were approved as read.

After expressing appreciation for his term in office retiring President Roeger introduced and installed the new officers for 1953, they being E. M. Gillen, President; Carl A. Hadra, First Vice-President; Edward C. Mishou, Second Vice-President; and Millard P. Snyder, Secretary-Treasurer.

Mr. Val Lyons introduced Mr. Angier of the Lake Charles Section who is transferring to this section.

Mr. Val Lyons spoke briefly about the new local engineering firm of Ferguson and Demopoulos.

Mr. A. A. Lyons moved that the Section appropriate sixty dollars (\$60.00) to give to the representative of the Section attending the forthcoming state convention in New Orleans. Mr. Ellis seconded the motion, which was carried unanimously.

President Gillen read a list of the committees for 1953.

President Gillen introduced the feature speaker, Mr. W. Murray, well-known local contractor, who spoke on "What does 1953 hold in store in the construction business?" Mr. Werner read a report prepared by the Associated General Contractors predicting a rosy outlook for 1953. The talk was enjoyed by all.

President Gillen announced that the next meeting of the Section would be held on the first Tuesday in March.

Mr. A. A. Lyons praised the barbecue put on by Mr. Ellis last autumn, suggested that a box be placed in a convenient place at each meeting to collect money for a barbecue fund, however this matter was not acted upon. Mr. Ellis stated that the cost of a barbecue is about two dollars (\$2.00) per person, offered the Section the use of the Caddo Parish Police Jury's Camp Soda for a barbecue at any time.

There being no further business the meeting was adjourned.

A most enjoyable dinner was served for this meeting.

MILLARD P. SNYDER, Secretary-Treasurer

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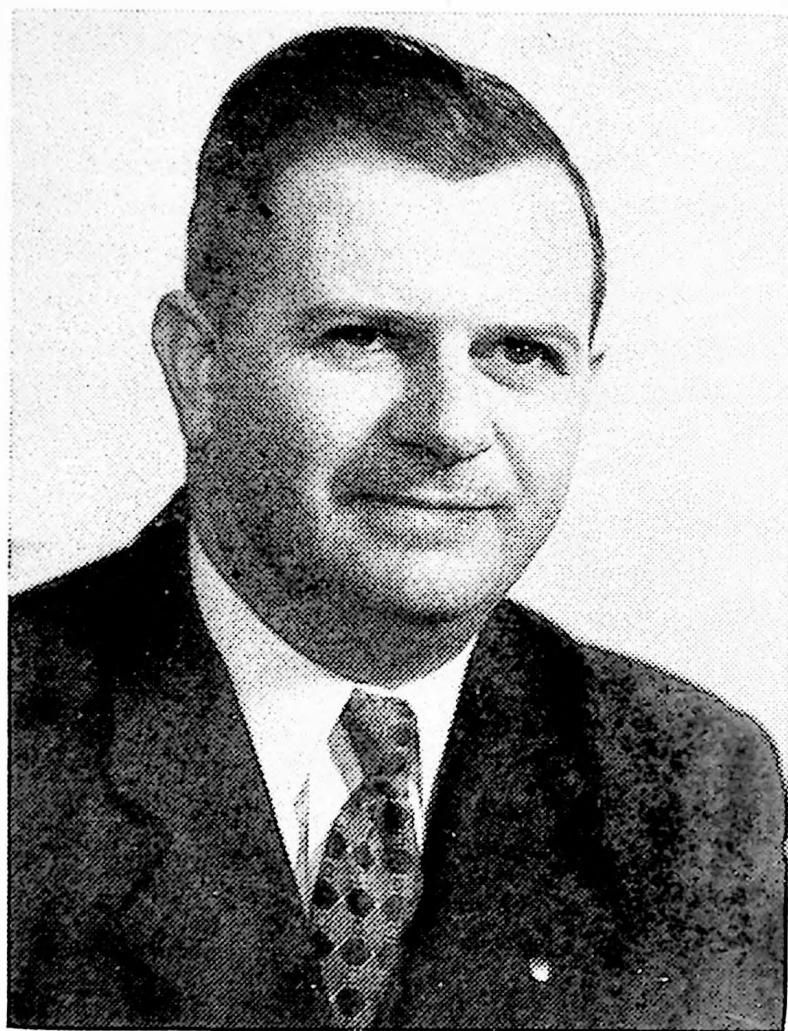
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President Michael C. Abraham

PROCEEDINGS

OF THE

LOUISIANA ENGINEERING SOCIETY

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JUNE, 1953

No. 2

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Our President's Picture. On the opposite page is the picture of President Abraham which should have appeared in the March issue. It portrays the genial personality of our president.

Just About the Half-Way Mark—

As this administration reaches the half-way mark, I believe it is in order and proper to inform our members of the excellent work being done by our committees. The following is brief, but comprehensive.

I am proud to report that excellent results on very short notice for recognition of Engineer's Week was obtained this year by Sidney Ellis and Waldemar Nelson, and that plans are being formulated now by Co-Chairmen Bill Drawe and Waldemar Nelson for a state-wide recognition of Engineer's Week in 1954. Our 1954 Annual Meeting will also be in capable hands with Dave Moodie as the General Chairman. Section Coordination is under the able chairmanship of Roy Sessums, and the influence of the work of this committee, will, in time, mean a great deal to the engineers of this State.

Vocational Guidance under the chairmanship of Lionel Cucullu is completing a most successful year, and the report of

this committee will be published in a later edition of the Proceedings. We are ably represented on the Citizen's Planning Committee by John L. Porter, Allan T. Dusenbury and Chas. S. Williamson, Jr. This Committee is very active, its sessions quite long, and the Society owes its thanks to our representatives for giving so much of their time to it. Furthermore, we have a very active and capable representative on the so-called Todd Committee, Alvin Fromherz. Proposed changes to the Building Code are reviewed by this committee.

Ben Bogard, Chairman of the Legislative Committee, has prepared some very interesting information which is under consideration by members of his committee. Some very tough problems have been assigned to C. Glenn Cappel, Chairman of our Special Activities Committee, very important to the welfare of the engineers in this State. A new Committee on Professional Study is under the guidance of Felix Alcus, and should be ready soon to offer to LES members quick review and reference courses at a very nominal cost, with the aid of the four engineering schools of the State. Jeff Collins is active with Honors and Awards, as is Benton Babin on Membership. Thanks of the LES to Raymond Bassich, Chairman of Employment, DeWitt Morris, Chairman of Entertainment and Outing, Arthur Hill, Chairman of Publications, Johnny Vogt, Technical Papers, Johnny Bedell, Chairman of Publicity, Reinhard Steinmayer, Chairman of Professional, Civic and Industrial Affairs, and Frank Macdonald, Chairman of Finance.

The functioning of the Louisiana Engineering Society is directly dependent on its committees. Although the above is just a quick review, it shows the many and varied activities the Society is engaged in, all beneficial to the engineering profession.

The response to my appeal for committee workers was overwhelming. This is a good healthy sign that the engineers in the State of Louisiana are ready to do their part for the good of the profession. Thanks for all the fine letters, and if you are not called on, please realize we filled in the ranks with the very first volunteers.

Technical meetings furnish the opportunity to get together with your fellow engineers in addition to knowledge gained from the lecture. Good attendance is healthy for the Society and beneficial to the individual. Poor attendance is destructive to the morale of the Society and disappointing to those who have worked hard to prepare the meeting. Support the Society by attending these meetings.

For the good of your profession—back-up the activities of the Louisiana Engineering Society.

MICHAEL C. ABRAHM

Our Annual Outing. DeWitt L. Morris is this year's chairman of our Entertainment and Outing Committee. Plans are set up for a gala affair at the Colonial Country Club. The date is Thursday, July 16, beginning at noon with golf and horseshoe pitching. Prizes will be for attendance, golf and horseshoes. Interesting and lively entertainment is promised. Reserve that date — July 16!

Nominations For Awards. The Society has established two award medals to honor engineers who have rendered noteworthy service through civic or technical accomplishment: the "Louisiana Engineering Society Civic Activities Medal—Andrew M. Lockett Award" and the "Louisiana Engineering Society Technological Accomplishment Medal". Each is to be awarded as conditions warrant, but not more often than once annually.

The Civic Activities Medal is presented for distinguished civic service rendered by an engineer in the interest of the public without compensation for such service. The character and scope of the service, rather than its scientific or professional nature, will be the predominant criteria for this award.

The Technological Accomplishment Medal will be given for attainments or discoveries contributing to the advancement of engineering.

The Board of Direction is now receiving nominations for these honors, and as chairman of a standing committee, district contact representative, or officer of the Society, you are eligible to submit candidates for the awards. Such nominations should be presented to the Board prior to September 1, and must be supported by the following information:

- a. Full statement of the training, experience and notable contribution of the nominee.
 - b. A statement of the basic reasons for submitting the nomination and for believing the nominee eligible for the honor.
 - c. Such other information and reference as may be of assistance to the Board in considering and acting upon the case.
 - d. It is essential that such nomination carry the present title and company connection of the candidate, and if he is retired, his present permanent address.
 - e. In drafting the citation, care must be taken to assure that the specific reason for bestowing the honor is clearly stated.
- One provision for making these awards is that they shall not be confined to members of the Society.

We shall be glad to receive your nomination on or before September 1. If no official nomination is received by this date it will be assumed that you do not wish to make a nomination.

Exhibits at the Engineers Club. The Engineers Club of New Orleans has recently started a series of technical exhibits to be

displayed at the Club's quarters in the DeSoto Hotel. The first exhibit was, appropriately, the Department of Civil Engineering's "Structures" display of model buildings and bridges which recently won first place in the Tulane Engineering Review. This is to be followed by a display of a "Model of the Destrehan Catalytic Cracking Unit" of the Pan-Am Southern Corporation. The third exhibit will be a plastics arrangement by the Bakelite Corporation. These will be followed by others at two-week intervals.

It is believed that these exhibits will provide a new medium for keeping local engineers posted on new procedures, practices and products. Local distributors, agents, manufacturers, etc. will be given an opportunity to display their products.

PERSONALS

Leon C. Weis, Life Member of the Society, died on April 1, 1953. Mr. Weiss had a large circle of friends among the architects and engineers of the community. His children are Elizabeth Jane, Leta Caroline and Leon Charles Weiss, Jr. Mr. Weiss resided at 7425 Dominican St., New Orleans.

* * *

Walter Stewart Rainville, Jr., of 98-10 70th Avenue, Forest Hills, New York, was today given an Award for Exceptional Service by the Defense Transport Administration. The Award was made by James K. Knudson, Defense Transport Administrator, at a meeting of the employees of the agency.

Mr. Rainville, who has served as Executive Assistant of the Defense Transport Administration since its formation in October, 1950, leaves his position April 24th to return to the American Transit Association, where he is Director of Research. He will continue, however, to remain available to DTA as a consultant.

In making the presentation, Administrator Knudson said: "It is quite fitting and appropriate that this Award for Exceptional Service should be made today as it marks the fifth anniversary of Mr. Rainville's entry into the field of transport mobilization planning for the United States Government." Mr. Knudson recalled that it was on April 10, 1948, that Mr. Rainville came to Washington on the invitation of Colonel J. Monroe Johnson, then Director of the Office of Defense Transportation, to assist in the preparation of plans for the mobilization of the Nation's transportation systems in the event of war, and that since that time he has been active in this field having served, in addition to ODT, the National Security Resources Board, the Office of Defense Mobilization Committee on Defense Transportation and Storage,

and the Defense Transport Administration, The Award for Exceptional Service contains the following citation:

"Walter Stewart Rainville, Jr., for exceptionally meritorious conduct in the performance of outstanding services to the United States as Executive Assistant, Defense Transport Administration. His broad experience and understanding of transportation problems as related to the mobilization activity, and in the development of policies, plans, and programs for the cooperative solution of these problems by the affected industries and the Government, were of immeasurable assistance to the Nation. His ability, his industry, and his untiring devotion to duty were of incalculable value to the mobilization effort of the Nation."

During World War II, Mr. Rainville served as Director of Equipment and Research, Highway Transport Department, Office of Defense Transportation. He has been identified with the urban transit industry since 1927, having joined the staff of the New Orleans Public Service Inc., upon graduation from the Tulane University of Louisiana. At the time he left New Orleans in 1942 to join ODT, Mr. Rainville was serving the New Orleans transit company as Director of Research. Walter Rainville is a member of the Louisiana Engineering Society. While living in New Orleans, he was active in engineering circles here.

During the presentation ceremony, Mr. Knudson also took occasion to pay tribute to the American Transit Association for its patriotism and vision in making the services of Mr. Rainville available to the Government, and to its generosity for doing so on an uncompensated basis.

New Members. The following election took place on the March 1953 ballot. We welcome these new members to the Society:

For Member

DUGAL A. BROOKS, Port Sulphur; age 47. Endorsed: A. J. Lehmann, Dewitt L. Morris, W. S. Nelson. Rice Institute, Engineering, 1923-24. Correspondence courses in Structural Eng.; Civil Eng.; Law; Ind. Management; Bus. Management. Mbr. Texas & Nat'l Societies Prof. Engrs.; ASME; Engrs. Club of N. O. Registered Prof. Engr., Texas, La. Gulf Refining Co., Draftsman, 1925-26. Gulf Production Co., Draftsman, Geophysical prospecting, 1926-28. Freeport Sulphur Co., 1928-date, now Supervisor of Eng., Grande Ecaille operations.

WALTER H. FUSH, New Orleans; age 37. Endorsed: M. C. Abrahm, B. H. Bell, L. J. Cucullu. La. State University, B.S.E.E., 1936. Cornell University, M.S.E.E., 1938. Registered E.E., La. Ebasco Services Inc., E. E., Res. Engr., Const. Eng., 1946-date.

JOHN BROWDER GIDDENS, JR., New Orleans; age 32. Endorsed: W. E. Blessey, A. R. Boelte, E. M. Dunn. University of Texas, B.S.C.E., 1943. Tulane University, graduate C.E., 1950-52. Registered C.E., La. Consolidated Vultee Corp., Stress Analyst, 1943-44, 1946-47. U.S. Navy, electronics school

and battleship duty, 1944-46. Austin Bridge Co., Office and Field Engr., 1947-50. Tulane University, Graduate C.E. and Student Assistant, 1950-51. Byrd & Bruns Bridge Co., Shelby Const. Co., Field Engr., 1951. Bd. of Commissioners, Port of N.O., field work, office design, 1951 to date.

FENTON HARDING, Lafayette; age 42. Endorsed: E. Domingue, H. M. Morris, F. W. zur Burg. Texas Technological College, B.S.C.E., 1933. Texas A & M College, Structural Eng., 1933-34. Armour Inst. of Technological M.S.C.E., 1940. Member A.S.E.E. Registered C.E., Texas. Texas A & M College, Graduate Asst. C. E. Dept., 1933-34. Texas Highway Dept., Inspection, time keeping, 1934-35. War Dept., Engr. Corps., N.O., Asst. Eng. Aide, 1935-37. Armour Inst. of Chicago, Graduate Asst. C.E. Dept., 1937-38. Philadelphia Navy Yard, Jr. Naval Architect, 1938-39. Texas Technological College, Instructor in C.E., 1939-41. Armour Research Foundation, Associate Engr., 1942-46. Southern Methodist Univ., Asst. Prof. C.E., 1946-47. Texas Technological College, Associate Professor C.E., 1947-52. Southwestern La. Institute, Professor of C.E., 1952-date.

WILLIAM F. HORRELL, JR., New Orleans; age 45. Endorsed: J. S. Janssen, R. L. Nall, L. K. Nelson. Loyola University, N.O., 1925-29; completed sufficient work to qualify for Bar Examination. Registered M.E., La. W. H. Horrell, Sr., Contractor, supervisor of Construction, 1929-33. N.O. Public Service Inc., 1933 to date, now Gas Industrial Engr. charge of estimating and design high pressure gas meter-regulator installations.

MAURICE R. HARTMAN, JR., Lake Charles; age 36. Endorsed: C. S. Childers, G. B. S. Ricketts, J. P. Tucker. International Correspondence Schools, Mech. Eng., 1935-41. Purdue Technical Institute, Industrial Chemistry course, 1945. Registered M.E., La. Member A.S.M.E. Matheison Chemical Corp., Eng. Draftsman, 1937-41. U.S. Engineer Corps, Chief Draftsman, 1941-42. M. W. Kellogg Co., Piping Engr., 1942-45. Matheison Chemical Corp., Asst. Chief Draftsman, 1946-date.

ALBERT F. LANDERS, New Orleans; age 45. Endorsed: L. T. Frantz, B. S. Nelson, B. H. Bell. Carnegie Tech, Industrial Engr., 1925-27, night school 1928. University of Pittsburgh, Arts and Sciences, 1933. Associate member, A.I.E.E. Carnegie Illinois Steel Corp., Jr. Engr., Supervisor, Elec.-Mech. Dept., 1927-33. Forest Hills Schools, Pa., Teacher, Electronic Eng., technical subjects, 1933-36. Carnegie Ill. Steel Corp., General Supervisor, Chief Engr., 1936-39. Westinghouse Elec. Corp., Design Engr., District Eng. Mgr., 1939-48. Loffland Bros. Drilling Co., Chief Engr., Prod. Engr., 1948-52. U.S. Steel Corp., Oil Well Supply Div., N. O., Special Representative, 1952-date.

GROVER JACKSON TRAMMELL, JR., Baton Rouge; age 33. Endorsed: L. J. Lassalle, W. P. Wallace, W. A. Wintz, Jr. Tulane University, B.S.M.E., 1949; M.S.(Math), 1950. Member Tau Beta Pi, Sigma Pi Sigma, Pi Mu Epsilon. Lafayette Ice Co., Lafayette, Ga., Manager, 1938-39. Summerville Irion Ice Co., Summerville, Ga., Manager, 1939-41. Tulane University, Graduate Asst. in Math, 1949-50. La. State University, Instructor, Mathematics and Engineering Mechanics, 1950-date.

For Transfer from Junior to Full Member

ROBERT DOUGLAS ALLEN, New Orleans; age 32. University of Michigan, 1937-39; Armour Inst. of Technology, 1940; Tulane University, 1945-47, B.E. in M.E. Registered, La. U.S. Navy, Eng. Officer, 1941-45. Gulf Engineering Co., Jr. Engr., 1947-50. U.S. Navy, Instructor, Repair Supt., 1950-52. Gulf Engineering Co., Inc., Industrial Repair Supt., 1952-date.

BERNARD L. KIERNAN, JR., New Orleans; age 34. Tulane University, B.E. in M.E., 1941. Registered M.E., E.E., La. U.S. Naval Reserve, Active Duty, Lt. Cmdr., 1941-46. Asbestone Corp., Production Mgr., 1946-51. The Foster Co., Inc., Gen. Production Supt., 1951-52. Asbestone Corp. (Nat'l Gypsum Co.), Production Supt., present position.

DAVID POKORNY LEVY, New Orleans; age 30. Tulane University, Mech. Eng., 1940-41. U.S. Naval Academy, 1941-44, B.S.E.E. U.S. Navy Officer, 1944-48. Equitable Eqpt. Co., Associate Engr., Production Engr., 1948 to date.

JOHN L. MARTINEZ, New Orleans; age 30. Tulane University, B.E. in M.E., 1943; La. State University, M.S.M.E., 1950. U.S. Army, Eng. Instructor, 3 yrs. Tulane University, Teacher of M.E., 6 yrs.

FELICIEN PERRIN, New Orleans; age 31. Tulane University, B.E. in M.E., 1946. Registered M.E. La. Simplex Mfg. Corp., Project Engr., 1946-48. Pan-Am Southern Corp., Asst. to Plant Engr., 1948-49; Draftsman, 1949-50; Div. Engr., 1951-date.

For Transfer from Junior to Affiliate Member

NAT B. KNIGHT, JR., Gretna; Tulane University, B.A., 1943; B.S.E.E., 1944; LL.B., 1932. Louisiana Public Service Commission, Member, utility and carriers, rates and services, property appraisals.

For Junior Member

HAROLD PAUL RABALAIS, Baton Rouge; age 27. Endorsed: W. H. Carter, W. A. LeBlanc, W. D. Poole. Southwestern La. Institute, B.S. Agri, Eng., 1951. Member La. Agri. Engrs. Ass'n. Apache Exploration Co., Inc., Seismograph Observer, Mar.-Nov. 1952. General Gas Corp., Safety Engr., Nov. 1952-date.

FULTON G. TAYLOR, Alexandria; age 28. Endorsed: O. E. Barron, R. L. Calhoun, L. J. Melancon. La. State University, B.S.E.E., Aug. 1949. Illinois Central R.R., Asst. Signal Maintainer, 1949-52. Southern Bell Tel Co., Jr. Engr., 1952-date.

MARION E. YOUNGS, New Orleans; age 28. Endorsed: W. H. Mercier, D. W. Stewart, R. M. Seago. University of Houston, B.S.M.E. 1951. Consolidated Chemical Co., La. Asst., 8 mos. Johnson Service Co., Office Engineer, 8 mos. International Harvester Co., Chief Clerk, application and sale of industrial eqpt. and farm eqpt., 3 yrs. Byron Jackson Co., District Sales Engr., 1951 to date.

AMERICAN CYANAMID'S FORTIER PLANT*

In July a year ago, we initiated action to acquire the plant site and were very fortunate to have been able to buy over 600 acres of plantation land on the west bank in Jefferson Parish, just this side of the St. Charles Parish line. The title search, carried out under the direction of the local legal firm, Milling, Saal, Saunders, Benson & Woodward, was taken back to Napoleonic times, at which time the property was owned by the Fortiers, the name chosen for our plant.

Our principal products initially are expected to be anhydrous ammonia, acetylene, hydrocyanic acid and acrylonitrile. We consider this plant a major installation of its kind with an expected investment in the neighborhood of 50 million dollars. We expect production of some products during 1953 with full scale operations reasonably expected early in 1954, unless unforeseen circumstances intervene.

Although the Company will produce large tonnages of sulfuric acid, ammonium sulfate and anhydrous ammonia at its New Orleans plant, acrylonitrile will be the basic product initially. The most recently discovered use for the versatile intermediate, acrylonitrile, is in the manufacture of soil conditioning agents.

Acrylonitrile will be made by combining Hydrocyanic Acid with Acetylene. Our Acetylene will be produced by the Badische Anilin and Soda Fabrik process for which our Chemical Construction Corporation is sole licensee in the United States, with exception of one Monsanto unit. This process is essentially the pyrolytic decomposition of methane—the heat being supplied by the combustion of methane with oxygen. Our Hydrocyanic Acid will be produced by our own process, from natural gas, ammonia and air. One of the most important economic aspects of our intermediate production is that our anhydrous ammonia is to be made from an offgas or tailgas from the acetylene process which is essentially carbon monoxide and hydrogen.

In addition to these main components, the project includes a Sulfuric Acid Plant of the standard Chemico type needed to supply sulfuric acid for removal of ammonia from the main Hydrocyanic Acid gas stream. The main product of this reaction, Ammonium Sulfate, we expect to market locally to agricultural interests.

At Fortier, utility power balances have been carefully worked out to provide most economical operation.

A total of 35,000 HP is required to produce the plant's product in the initial phase of operations. There will be almost 300,000 lbs. of steam per hour consumed in process initially. About 25,000 HP of mechanical energy can be produced with this quantity of steam

* By Gerard J. Forney, Project Manager, American Cyanamid Co. Presented at the regular meeting of the Society.

by judicious use of back pressure or extraction steam turbines. It is for this reason that the boiler pressure was set at 650 lbs. psig.

The power plant has been laid out for installation of future turbo generator sets for the production of electricity, if future heat balance studies prove that it will be economical to generate this power. At present, it is contemplated that 7,000 KW will be purchased from the Louisiana Power and Light Company for the first phase of operations. To serve this plant, the Louisiana Power and Light Company will provide two 12,000/20,000 KVA, 3-phase, 110,000/13,800 volt transformers for present and future plant requirements. There will be a total of 24 unit type substations within the plant to serve the various process areas. Power will be transmitted throughout the plant at 13,800 volts via rubber insulated Neoprene jacketed cables carried in underground ducts. In the electrical system many plug-in type units have been specified. Entire units can be interchanged very quickly and the faulted component repaired under the best conditions in the well-equipped shops provided on the plant site.

Initially, 80,000,000 gallons of water per day will be circulated at the plant. Of this total, approximately 10% or 8,000,000 gallons per day will be taken from the river through a large intake structure and pumped to a large clarifier. From this latter area, water will be distributed throughout the plant to be used for such purposes as boiler feedwater, engine jacket water and cooling tower. A total of three quarters of a million gallons per day of water will have to be treated so that it can be made chemically pure enough for use as boiler feedwater. The largest proportion of clarified water will be used for cooling purposes. It has been proven economical to provide cooling towers for cooling water, thereby reducing the quantities that must be taken from the river and clarified.

The plant will consume several million cu. ft. of natural gas per day. Approximately 80% of this total will be used in process, or mechanical drives, the remainder will be used for firing the boilers. Certain by-product gases with a residual BTU will also be burned under the boilers.

The chemical effluents will be collected in a large clarification pond. This product will be passed through an automatically controlled chlorination station. The outgoing stream will pickup the sanitary sewage and discharge into the Mississippi River.

ENGINEERING BRIEFS

Diesel Round the Bend. The inland waterways of the United States now carry almost twice as much freight as do the Great Lakes. This river and canal traffic, carrying well over 325 million tons of bulk cargo annually, is currently expanding vigorously, despite competition from railroads, trucks, and pipelines. Although inland waterways are generally thought of as rivers or fresh-water canals, the Gulf and Atlantic Intracoastal waterways are also part of the U.S. inland waterway system. Shallow channels and protection against rough water lead to much the same towing practices as on the rivers.

Petroleum and heavy chemicals from new plants in the Gulf region supplement the usual cargoes in river traffic going up the Mississippi and its tributaries. This steady flow of cargo has spurred development of the so-called "integrated tow," in which barges are joined together in multiple and are pushed, rather than pulled, by a towboat. The lead and terminal barges in the tow are built with one shaped and one square end, with the square ends butted to the square-end center barges of the tow to form an overall streamlined unit. One such integrated tow of, say, six or eight barges may have a capacity of eight million gallons of oil, and may be over a thousand feet long.

Many different types of barges are provided for various cargoes. Some are for weather-resistant deck cargoes, such as sand, gravel, or crated farm machinery; others are for dry cargo in closed holds, or for special cargoes. There are two barges in operation designed for carrying molten sulfur, and another barge can handle 233,000 gallons of hydrochloric acid — as much as 29 large railroad tank cars. A typical barge for carrying coal might be 175 feet long by 26 feet wide, a capacity of about 1,000 tons. A river oil barge might be 195 feet long by 35 feet wide, with a capacity of 10,000 barrels; some are a hundred feet longer, with more than twice the capacity. Perhaps the most unusual sight in river traffic is the loads of truck trailers carried overnight between New York and Albany on converted LST's, or the Mississippi River tows carrying 600 automobiles and trucks on triple-decked barges.

Powerful Tows

The towboats for present-day barge lines are about 150 feet long and 40 feet wide, and carry the engines, oil tanks, stores, and crew accommodations, on a draft not much more than nine feet. Among the river tugboats launched in 1952 were 21 of 1,000 horsepower or more; units of 3,000 hp. or more are not rare, and installations of up to 5400 hp. are reported. These are much higher than for typical harbor tugs, which average 600 hp. Flanking and

steering power, achieved by large rudders fore and aft of the screws, are as important as thrust to the river tug. Lashed solidly into tows, these tugs must navigate in heavy currents around river bends of a radius sometimes only two or three times that of the tow length. Another difficult maneuver is to bring a heavy tow alongside a landing.

Channel depth can have an important effect on shipping costs, for until the clearance between the bottom of the barge and the channel bed exceeds the draft of the barge, the effect of bottom drag is appreciable. In a nine-foot channel, for example, increasing the draft of a barge from seven to eight feet can increase tug horsepower requirements by 50 per cent. The shallow draft generally available also poses some difficult problems in towboat design. The trend is away from stern wheelers, but the conventional large-diameter propellers of ocean-going craft are not applicable. The propellers of many modern river boats are housed in tunnels or streamlined Kort nozzles to permit efficient thrust in spite of shallow depths and high horsepower. Many other steps have been taken to reduce overall costs. New engine controls reduce requirements for engine-room personnel, and radar and other electronic navigation aids cut down the time lost because of fog and darkness.

Except for the Hudson, which can take oceangoing vessels as far as Albany, most U. S. rivers are plagued with shallow depth, and only by tremendous expenditures have some of them been made navigable. The Monongahela River, for example, has 15 dams to permit year-round traffic. Flowing through numerous coal fields which serve the Pittsburgh steel area, this river in 1951 carried more than 32 million tons of traffic, of which about 26 million tons were coal. The building of ten dams on the Tennessee River has provided a channel with a depth of 11 feet, carrying a rapidly expanding traffic. Industrial expansion along the Ohio River is expected to increase river traffic from 56 million tons in 1951 to more than 100 million tons in the next five years.

The procedure of canalizing the main bed of large rivers by many multiple-purpose dams is one which has become feasible only in recent decades. During the heyday of canal building in this country, around the beginning of the 19th century, it was the custom to parallel the natural river bed with a ditch of relatively modest cross-section and similarly limited carrying capacity. In some instances, however, it is still the best solution; an example is the new eight-mile canal and lock near St. Louis which by-passes a treacherous section of the Mississippi.

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

What's New. New products for greater productivity were displayed recently in Boston by the American Research and Development Corporation, one of the country's leading public venture-capital underwriters. The 19 exhibitors in the "Products with a Future" show were mostly newer organizations with their own contributions toward sustaining the average three per cent annual increase in national productivity, with its attendant rise in wages, dividends, and employment.

Many of the products shown are time savers. A densitometer comparator, for example, through measurement of lines on a spectrographic plate, indicates the composition of inorganic materials quantitatively, in only a minute or two, as compared with several hours by ordinary methods. A mass-flow meter gives instantaneous and cumulative records of the amount of material flowing through a pipe or other conduit. An impedance analyzer can give, in a few minutes, information on an electric circuit which might take several hours to compute by conventional methods. Odorants for fuel gas can point out leaks early enough for the gas saved to pay for the odorization. Tanned upper and other light leathers can be produced in a matter of minutes by a new chemical treatment now being perfected; standard methods may require several hours.

Electrical resistors built in an expanded mesh design to carry high currents, and extruded plastic pipe which minimizes corrosion losses illustrate more efficient use of materials. Automatic control devices were represented by a time-lapse meter useful in putting a batch chemical process onto an automatic and continuous basis, and equipment for radioactive tracer work was also highly automatic.

Other products included multi-channel recorders used by the Civil Aeronautics Authority to transcribe radio conversations between aircraft and control towers and a binaural sound system, based on simultaneous recording on both edges of a magnetic tape from two microphones, for greater realism in home music reproduction. An auxiliary jet engine for extra power in conventional aircraft during an emergency promises to increase the safety factor in planes operating in mountainous areas.

Most of the products exhibited were complicated and expensive, and slanted to a specialized market. Many such products might require a relatively long time to become profitable and to pay off the original investment; risk capital, however, had backed each of the products on display, and some have already proved their worth. A further effect of the show was to point out that the availability of such capital could make a substantial contribution to the economy as a whole. — *From Industrial Bulletin of Arthur D. Little, Inc.*

Picture Book. The first complete book to make use of a new photographic type composing machine has just come off the press. The new process involves preparation of a film "proof," from which the final printing plates are prepared either for offset or letterpress, with no conventional lead type being used. This new step in the printing art has been developed by the Graphic Arts Research Foundation, Inc., of Cambridge, Mass., working on behalf of its 275 supporting members.

Keystone of the new process is the Higonnet-Moyroud machine, now known as the Photon. This looks like a simple piece of office machinery, but on it a typist can compose printed material in any of 16 complete fonts of type at sizes ranging from 5 to 36 points, all at a speed controlled only by the typist's ability to operate a standard electric typewriter. Not only can type styles be mixed within a line by the Photon, but point sizes and type families may also be mixed without interfering with alignment or justification, i.e., spacing, of the line, which the machine performs automatically.

In the Photon, the operator uses a standard electric typewriter keyboard with four extra keys and a fifth row of keys which provides for corrections, eliminations, automatic centering, insertion of spacing, and the like. When a key is depressed, two "memory" devices are actuated. One of these is a board consisting of rows of movable pins. For instance, when the key for "m" is struck, some of the pins are mechanically pushed out to form a code pattern for that letter. In the second memory, consisting of electric switches, like those used in dial telephoning, information on the width of the character is stored. When the typist finishes a line, this device calculates how much space must be provided between the letters and the words to make the line come out to just the right length (to "justify" the line within the given margins).

The actual type characters to be "set" by the Photon are printed on a continuously rotating glass disc, with different type styles arranged in concentric rings around the disc. As the machine operates, a reading carriage travels over the "pin-board," and electrical "feelers" read the pattern of pins to discover which letter should be printed next. Electric impulses from the "feelers" set off a brief, but intense, flash of light from a strobotron tube (commonly used in high-speed photography), when the proper letter on the revolving disc passes before the tube's optical system, and the image of the letter falls on the final photographic film. Meanwhile, the switch-memory adjusts the horizontal position of the letter image on the film, to insure that a well-set page results. When the page is finished, the film is removed and developed.

Cleanness of the typesetting is one of the chief characteristics of Photon operation. The character of the final image is determined throughout by optical or photographic means, and there is no fuzziness in printing, such as that associated with the customary lead characters. By simple switch operations the operator can change the size of the letters (by changing lenses within the machine) and can choose one of the sixteen type faces available on a single disc.

Saving Predicted

Judging from the cost savings attributed to the machine, in comparison with standard equipment, it should find a ready market. For example, the glass scanning disc with its printed type fonts contains the equivalent of \$25,000 worth of linotype matrices weighing more than two tons, and requiring more than 90 cubic feet of storage space. Moreover, maintenance should be simple, since key-boarding, coding and decoding units, and photographic elements have been constructed as plug-in elements which may be readily replaced.

Ten production models of the Photon are now being assembled by Photon, Inc., licensees under Graphic Arts Research Foundation patents, and it is expected that these ten will be placed in commercial operation in the next two or three months; subsequent production runs are already being planned. The first machines will be applied to a number of different printing problems, including newspaper and book publishing.

Successful operation in the field, together with its qualities of simplicity, high-speed operation and versatility, should gain for the Photon the status of a major advance for the printing industry.

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

* * *

Divine Right of Kings. The Selma, California, Enterprise recently ran an editorial called "Divine Right of Kings" which deserves the attention of thinking people everywhere. It began, 'In the old days of absolute monarchies, government considered it had divine blessing to do anything it pleased. Perhaps because our own government has grown so large and powerful, some of its agents seem to think they enjoy the same god-like privileges.'

The enterprise then went on to describe a current controversy in California which illustrates that point perfectly. Back in 1949 a taxpaying, publicly regulated utility company was granted a license by the Federal Power Commission to build power plants on one of the state's rivers. But this didn't suit the Bureau of Reclama-

tion, which wants to do the job itself — with the taxpayers' money. The Bureau asked the FPC to cancel the license, and was turned down.

Then the Bureau sought special Congressional legislation to gain its end — which is socialism pure and simple. Congress refused. Still the Bureau wouldn't give up. It went before the FPC again with its case — and again FPC said no, and renewed the license granted the private utility.

This, any reasonable man would think, would be the end of the matter. But the socialists in the Bureau never say die. A short time ago the Bureau asked the Department of Justice to take legal action in an attempt to overturn the FPC's decision.

In concluding its editorial, the Enterprise said, 'The Federal power planners argue that they should have the first chance at any power development, anywhere . . . As far as rules and regulations, Congressional decisions, and the wishes of local people are concerned, those are matters for ordinary folk to worry about. Royalty needn't be bothered.'

This "divine right of kings" attitude is one of the most ominous characteristics of the time. It is found in every branch of our huge, unmanageable government structure — and it is particularly rampant among those whose driving ambition is to socialize industry, make government all-powerful, and to sabotage the free enterprise system. It is the kind of attitude which, far enough extended, leads to dictatorship and the crushing of all freedoms. The California example is but one of many. — *Industrial News Service*

* * *

New Anti-malaria Drug Announced. Daraprim (pyrimethamine) an antimalaria drug said to be more powerful than any yet known, was reported recently by U. S. Public Health Service scientists at a recent meeting of the American Society of Tropical Medicine and Hygiene held at Galveston, Texas.

Even the conservative Public Health scientists say that a person could, if he took this drug, go into a region heavily infested with malaria and never contract the disease while there or after leaving the region. Prisoner volunteers who were given this drug after being bitten by malaria-infested mosquitoes showed no signs of contracting malaria as long as a year later.

Daraprim is twelve or more times as powerful as chloroquine. It is inexpensive, odorless, tasteless, and does not discolor the skin.

The new drug was developed by Dr. George H. Hitchings of Burroughs, Wellcome & Co., Tuckahoe, N. Y.

—*From Aminco Laboratory News*

* * *

First Total Synthesis of Cortisone Achieved. Total synthesis of cortisone, the antiarthritis hormone chemical, all the way from simple, readily available chemicals to cortisone itself, can be done through a 30-step process developed by Dr. Lewis H. Sarett and associates of Merck & Co., Rahway, N. J.

The American Chemical Society, which has published a report of the method, states that this is the first report of the preparation of cortisone in one laboratory by total synthesis through a single, uninterrupted series of reactions.

—*From Aminco Laboratory News*

* * *

Sound Waves Test Giant Steel Rolls. Ultrasonic sound waves are being used in material inspection by shooting them through the material and making permanent chart records of the reflections (echoes).

While ultrasonic inspection devices have been used in recent years, a new camera attachment makes possible a permanent photographic record of the chart. Such camera-equipped ultrasonic inspection devices are being employed by the Blaw-Knox Co., Pittsburgh, Pa. for inspecting the large steel rolls for standard quality control.

Any crack, cavity, or other discontinuity in the casting is located easily, while the camera perpetuates the screen image for checking and recording purposes. — *From Aminco Laboratory News*

* * *

A Myth. Many perfectly fair-minded people firmly believe that the railroads were subsidized by the United States government during the pioneering days of the industry.

Actually, this is a myth. But over the years it has been dressed up as a fact . . . and rather widely-accepted as a fact. Yet, it is not a fact at all.

The true . . . and documented facts . . . are that the Federal government granted a number of railroads 131,000,000 acres of

wild, unsettled land estimated to be worth \$123,000,000 at the time the grants were made.

Another myth . . . dressed up as a fact . . . also widely prevails. It is that all the railroads received land grant assistance. Actually, only 17,500 miles . . . or about seven percent . . . out of the present 235,000 railway mileage received such aid.

In making these grants, the government affixed a proviso which stipulated that the land-grant railroads would be required to handle government traffic, civilian government personnel and troops at half rates and half fares .

When this Land Grant Agreement was repealed in 1946 by the Congress, the railroads had paid to the Federal government . . . in the form of reduced rates and fares . . . \$1,250,000,000 (*billion*) . . . or ten times the value of the lands at the time they were transferred to the railroads.

Another myth about the railroads . . . generally accepted as a fact . . . is that the railroads, many years ago, received widespread financial aid from numerous communities throughout the United States.

This is a fractional truth dressed up as a whole truth. In certain communities a few railroads did receive such assistance, but it was the exception . . . not the rule.

There is one significant difference, however, between the land grant and community aids received by a *few* of the railroads and what *all* the commercial air lines have been receiving for many years. It is this:

Once those railroads received the land grant aid and the assistance of a community, that was the end of it. Thereafter, they were strictly on their own.

But that is not the case with the commercial air lines. They have been treated quite differently . . . and generously. The taxpayers have poured hundreds of millions of dollars into airport terminals and facilities, federal airway aids and in air mail subsidies. This particular tax burden has grown increasingly heavy over the years . . . and no relief is in sight.

The use of taxpayers' money to provide basic facilities . . . indefinitely . . . for any form of transportation is economically unsound and manifestly unjust. It is a form of subsidy which can . . . and is . . . weakening our national transportation system . . . and eventually it must be stopped. — *From T & P Topics*

**OBITUARY OF
BERNARD HENRY GREHAN**

Died Monday, December 15, 1952

Bernard Henry Grehan, the son of Bernard and Caroline (Simon) Grehan, was born in the City of New Orleans, on September 4, 1893.

His early education was received in the New Orleans preparatory schools. In the year 1911 he entered Tulane University, from which he graduated from the School of Civil Engineering in 1915. He subsequently obtained his Masters Degree from Tulane University in 1923.

At the beginning of World War I, he attended Officers Training Camp, and in 1917 received his commission as an officer in the Army of the United States. Later he served overseas as a First Lieutenant, Corps of Engineers, with the 312th Engineers of the 87th Division.

After the Armistice, he returned to civilian life, and in 1919 entered into the employ of the firm of George J. Glover Company, Inc., as Structural Engineer. In 1924 he was made a member of the firm, and shortly thereafter was elevated to the position of Vice-President. He remained in this capacity for the following 25 years, and in 1949 he terminated his connection with this firm and became associated with the Boh Brothers Construction Company — in charge of the building division.

Mr. Grehan was intensely interested in his profession, and devoted much of his time to it. In 1925, he was appointed to the Louisiana State Board of Engineering Examiners, serving continuously until his voluntary retirement in 1947 at which time he was serving as Secretary. He was a member of the Louisiana Section of the American Society of Civil Engineers, the Louisiana Engineering Society; and the New Orleans Chapter of the Associated General Contractors of America. He served as President of these organizations during the year 1929, 1938, and 1947 respectively.

Mr. Grehan was made a member of the Board of Administrators of the Tulane Educational Fund in 1940, serving as Chairman of it's Real Estate Committee. He was an active member of the Boston Club, of the Louisiana Club, and of the Recess Club.

His pleasing personality, his wit and fine sense of humor endeared him to all who knew him, and won for him many friends. His competency and high ethical standards in his own chosen field placed him in high esteem amongst his colleagues and professional contacts.

Mr. Grehan is survived by his wife, the former Miss Marie LeMore; a son, Bernard Albert Grehan; three daughters, Mrs. W. C. Ellis; Mrs. Jack W. Pou, and Mrs. Luther E. Hall, Jr.; his mother, Mrs. Caroline Simon Grehan, a brother, Harold S. Grehan; a sister Miss Carrie E. Grehan; and four grandchildren.

FREDERIC N. BILLINGSLEY
BERNARD DORNBLATT
CHARLES M. KERR

OBITUARY OF CALLENDER FAYSSOUX HADDEN

Callender Fayssoux Hadden, affectionately known to his many friends as Cal Hadden, died in New Orleans on February 7, 1953. He was born in Boerne, Texas, on June 25, 1885. He graduated from Dixons Military Academy in 1901 and entered Tulane on an honor scholarship where he graduated with distinction in 1905 as a mechanical and electrical engineer with a degree of Bachelor of Engineering.

He was employed as a sales engineer for Allis-Chalmers from 1905 to 1907 and until 1909 as a sales engineer for Electrical Appliance Co. and the Fairbanks Co. of New Orleans.

In 1909 he helped organize the Standard Supply Co., later called the Standard Supply and Hardware Co. of New Orleans, of which he was president at the time of his death, after serving since 1941 as treasurer and executive vice-president.

He served in the Regular Army in 1917 and became a member of the Coast Artillery Reserve in 1919.

He was a member of the Louisiana Engineering Society, American Society of Mechanical Engineers, Controllers Institute of America, American Legion, Sons of Colonial Wars, and Military Order of World Wars.

Mr. Hadden was also a Thirty-Second Degree Knights of Templar and belonged to numerous local clubs, including New Orleans Country Club, Suothern Yacht Club, Stratford Club, Army and Navy Club, and Engineers Club.

While for many years Mr. Hadden's work as a business executive occupied most of his time, he had numerous opportunities to utilize his engineering education and took an active interest in engineering affairs.

Mr. Hadden will be long remembered by his many personal friends and business associates.

Your committee feels that the Louisiana Engineering Society should pay tribute to our late fellow member and friend, Cal Hadden, by adopting this resolution:

BE IT RESOLVED that the the Louisiana Engineering Society adopt resolutions embodying the above facts and that these resolutions be used upon the minutes of the society and published in its proceedings and that a copy be sent to the members of his family together with the expression of our sincere sympathy.

CHARLES C. CRAWFORD
T. B. LOCKETT

OBITUARY RESOLUTION

Prepared in Memory of Fellow Member

GUSTAVE CHARLES KRAUS

by the Louisiana Engineering Society

WHEREAS, it has pleased the Lord God Almighty to call from our midst on December 11, 1952, our brother member, Gustave Charles Kraus, while in his 66th year on this earth, and,

WHEREAS, during this time he served the New Orleans Public Service Inc. diligently and faithfully for fifty years in many positions, having advanced to the position of Assistant Superintendent of Rail Equipment at the time of his death, and

WHEREAS, he also held active membership in the New Orleans Chamber of Commerce, Young Men's Business Club of New Orleans and The Research Institute of America at the time of his death, and

WHEREAS, throughout his life his actions and business associations have brought credit and honor to the engineering profession, and

WHEREAS, he spent his life helping and doing for others, never seeking or asking anything in return, but always getting his greatest pleasure from making others happy,

THEREFORE, BE IT HEREBY RESOLVED and spread upon the minutes of this meeting of the Louisiana Engineering Society that we, by these presents, do hereby acknowledge with deep sorrow and affection his untimely passing and extend our sincerest heartfelt sympathies to his bereaved family, and

BE IT RESOLVED, that copies of these Resolutions be forwarded to his wife, Sarah Lanphier Kraus, to his four sons, Guy H., Malcolm P., Russell L. and Burckel T., to his two daughters, Mrs. Helen K. Smith and Mrs. Roby K. Laylock and to his three brothers, William, Charles and Frederick.

ARTHUR J. NAQUIN

ROBERT W. ZIIFLE

OBITUARY OF GROVER C. RACKERBY

A very loyal and efficient member of the engineering profession and a fellow member of this Society, Grover C. Rackerby, passed away on 29 November 1952, at the age of 68 years.

He was born in Rackerby, California, on 29 September 1884. He received his primary education in local schools and took an I.C.S. course in Civil Engineering.

Between 1902 and 1909 he worked as an apprentice and foreman carpenter. During a portion of this period, he was engaged in the rebuilding of San Francisco after the earthquake of 1906. He was assistant superintendent of buildings and bridges with a logging railway in 1909. In 1911 he began his engineering career, doing topographic surveying in connection with land subdivisions. He was engaged in railway location, and mining and oil development work in California and New Mexico. He was employed on a large amount of Reclamation and Flood Control Work. In 1912-13, while employed by the State of California, he located the "Sutter Basin Bypass" of the Sacramento River, a pioneer water diversion project, somewhat similar to the Bonnet Carre Floodway. He was first employed by the United States Government in 1917 on the construction of Camp Cody, New Mexico and later the same year, by the First New Orleans District. From 1917 to 1921 he was in charge of survey work at the mouth of the Mississippi River. He was engaged in the contracting business from 1921 to 1929, except for the period from August 1923 to March 1928, when he was employed by the Board of Commissioners of the Port of New Orleans as Field Engineer on the construction of public wharves. He was re-employed by the First New Orleans District in 1929, and was transferred to the New Orleans District, Corps of Engineers, in November 1940, in the consolidation of these officers, where he remained until his death. During the second period of his service with the Corps of Engineers, he was head of the Permit Section a large portion of his time, where he inaugurated the system of inspecting oil exploration under water bottoms. As head of the Permit Section, he showed that he was thoroughly conversant with the laws and regulations applicable to the subject, and his recommendations for the proper action were always made in the interests of the United States with the proper consideration of the rights of the applicants. His work brought him in contact with a great many people in the business world, who in addition to his friends and associates will regard his death as a personal loss.

He was married to Emma Glynn of Gynn, Louisiana, who passed away on 30 July 1949. She was the daughter of Senator Martin Glynn who was instrumental in having the U. S. Mississippi River Commission adopt the project for the protection of the banks of the river in Grand Bay bend.

It is recommended that a copy of this Obituary be spread on the minutes of the Society and that a copy be sent to the family of Mr. Rackerby.

GEORGE D. WADDILL

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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

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B

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- 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.
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- JOHN H. BERNHARD, (L.M.), (1912), Consulting E., Ave. de los Alpes 475, Mexico, D.F.
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- MALCOLM BIENVENU, (J), (1949), E. E., B. O. 2, 750th A.C.W. Squadron, Boron, Calif.
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- J. I. KOTTER, (J), (1951), M. E., 2929 Dublin St., New Orleans 18, La.
- HAROLD F. KRAUS, (J), (1950), E. E., R., U. S. Navy. 737 Voisin St., New Orleans 24, La.
- 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. P.O. Box 1149, Pasadena, Tex.
- EMILE S. KROUSE, JR., (J), (1952), Agri. E., R., Gulf States Utilities Co. 340 Florida St., Baton Rouge.
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- KENNETH D. R. LACROIX, (1951), Ch. E., Esso Standard Oil Co. 2422 Hollywood Drive, Baton Rouge, La.
- EDWIN A. LAFAYE, M. E., R., Murray-Baker-Frederic, Inc. 4963 Kendall Drive, New Orleans.

- 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. 5412 Milne St., New Orleans 19, La.
- GEORGE B. LAMBERT, JR., (1939), Engineer, M. T. Reed Construction Co. Mississippi City, Miss.
- ALBERT F. LANDERS, (1953), U.S. Steel, Oil Well Supply Div., 1205 Nat'l. Bk. of Commerce Bldg., New Orleans 12.
- 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, La.
- 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. Asbestone Corp. 411 Warrington Drive, New Orleans, La.
- HERRICK J. LANE, (L.M.) (1929), C. E., W. Horace Williams Co. 833 Howard Ave., New Orleans 13, La.
- HERRICK J. LANE, JR., (1946), C. E., W. Horace Williams Co., 1206 Nashville Ave., New Orleans 15, La.
- EDMOND J. LANGHETEE, JR., (J), (1951), Petroleum E., R. La. Land & Exploration Co., 4405 Cartier Ave., New Orleans 22, La.
- JOHN E. LANGLEY, (1951), M. E., R., Esso Standard Oil Co. 1812 Ingleside Dr., Baton Rouge, La.
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- FERNAND S. LAPEYRE, (1948), M. E., E. E., R., The Peelers Co., 635 S. Peters, New Orleans, La.
- WILLIAM M. LARKIN, (1944), E. E., Gulf States Utilities, Lake Charles, La.
- LEO J. LASSALLE (1936), C. E., M. E., R., La. State University and A & M College, University Station, Baton Rouge 3, La.
- DOUGLAS F. LATIMER, (1946), M. E., C. E., Gulf States Utilities Co., P. O. Box 2431, Baton Rouge, La.
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- 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., 528 Kenmore Ave., Baton Rouge 11, La.
- W. STONE LEAKE, (1934), E. E., R., General Electric Co. 1004 Richard Bldg., New Orleans 12, La.
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- 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., C. E., National Electric Products Corp. 5700 Garfield St., New Orleans 15, La.
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- ROBERT E. LEE, JR., (J), (1951), M. E., Esso Standard Oil Co. 3124 Tyrone Dr., Baton Rouge, La.
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- H. I. LEHMANN, (1937), C. E., R. La. Dept. of Highways, Baton Rouge, La.
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- DAVID J. LEVINE, (J), (1952), M.E., R., Equitable Equipment Co. Inc. 410 Camp St., New Orleans 12.
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- WILLIAM A. LOCHTE, (1945), M.E., American-South African Steamship Co. 7021 Hickory St., New Orleans 18, La.
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- SPALDING KENAN MANSON, JR., (1942), C. E., R., Clifford A. King, 401 Park Road, New Orleans 20, La.
- MICHAEL J. MARCHESE, (1948), C. E., U.S. Engineer Corps, N. O. Dist. 1716 St. Roch Ave., New Orleans 17.
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- HAROLD O. MARQUART, (1943), C. E., Gaylord Container Corp., Mill Div. P.O. Box 322, Franklinton, La.
- GORDON A. MARSALIS, (1951), C. E., R. Industrial Steel Products Co., Inc., P.O. Box 1814, Shreveport.
- JAMES H. MARTIN, JR., (1941), E. E., R. Woodward Wight & Co. 2712 Palmer Avenue, New Orleans, La.
- LUCIEN T. MARTIN, (J), (1952), E. E., Rt. 2, Box 167, Breaux Bridge, La.
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- CONRAD W. MARVIN, (1952), M. E., Ch. E., R., Texas-Eastern Transmission Corp. P.O. Box 1612, Shreveport.
- AUSTIN J. MARY, (1946), E. E., R., Gulf States Utilities Co. 1767 Cedardale Ave., Baton Rouge.
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- ALLEN J. MATHERNE, JR., (1943), E. E., Gulf States Utilities Co. 41 Eucalyptus Road, Maplewood, La.
- RUSSEL A. MATHERNE, (1945), M. E., R., Barnard & Burk. 5236 N. Afton Parkway, Baton Rouge, La.
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- GEORGE ELMER MAY, (1940), M. and E. E., R., N. O. Public Service Inc. 2031 Short St., New Orleans 18, La.
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- CHARLES J. MAYEUX, JR., (1947), C. E., R. Gaylord Container Corp. 906 North Border Drive, Bogalusa, La.
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- SAMUEL H. McAFEE, JR., (1950), M. E., New Orleans Public Service Inc. 2838 Iberville St., New Orleans, La.
- CHARLES R. McBRIDE, JR., (1950), M. and E. E., Firestone Tire & Rubber Co. 1711 Fifteenth St., Lake Charles, La.
- JOHN I. McCain, C. E., R., Manson-McCain, Inc., 8200 Florida St., Baton Rouge, La.
- JOHN C. McCAMPBELL, (1952), Geologist. Tulane University, P.O. Station 20, New Orleans 18.
- A. HEWS McCANN, (1946), Architect, C. E., R., La., Ia., Ill. Partner. A. H. McCann & Associates. 410 Howes Bldg., Clinton, Iowa.

- DANIEL B. McCARTY, (1951), C. E., R. La. Dept. of Highways, 1618 Louisiana St., Covington, La.
- R. A. McCLENAGHAN, (1949), C. E., R., La., Tex. McClenaghan & Barr, Engineers and Architects, P. O. Box 4117, Shreveport, La.
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- JAMES P. McCULLOUGH, (1938), Ch. E., United Gas Pipe Co. P. O. Box 1407, Shreveport, La.
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- WILLIAM E. McFARLAND, (1953), Ch. E., Godchaux Sugars, Inc., Reserve, La.
- J. LUCIUS McGEHEE, (J), (1949), M. E., E. E., R., Mente & Company, P. O. Box 690, New Orleans, La.
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- LEAL C. H. McLEAN, (1933), M. and E. E., Jones & Laughlin Steel Corp. P. O. Box 66, New Orleans 6, La.
- EDWARD A. McLELLAN, (1938), M. E., R. McLellan Equipment Co. 2375 Tchoupitoulas St., New Orleans 13, La.
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- EDWARD C. MISHOU, (1949), Petroleum E., M. E., R., Interstate Oil Pipe Line Co., Southern Div., 14 Lakeforest Hills, Shreveport, La.
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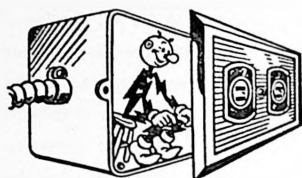
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- ARTHUR L. WALKER, (1943), C. E., Tidewater Dredging Co. Humble Oil Bldg., New Orleans, La.
- J. D. WALKER, (L.M.), (Jan. 8, 1908), C. E., R., Lang Co., 2500 Poydras St., New Orleans 19.
- CHARLES WM. WALL, (J), (1948), M. E., Esso Standard Oil Co., La. Div. 1609 Moreland Ave., Baton Rouge, La.
- JOHN E. WALLACE, (1948), Field E., Gaylord Container Corp. 817 Avenue B. Bogalusa, La.
- WAYNE PAUL WALLACE, (1936), C. E., R., Louisiana State University. Baton Rouge 3, La.
- STEPHEN J. WALLBILICH, (1926), C. E., R., Corps of U.S. Engineers. 4212 State Street Drive, New Orleans 15.
- C. PERCY WALTERS, (1947), Operating E., Gulf States Utilities Co., 4333 Broussard St., Baton Rouge 12.
- FRANK C. WALTERS, (A), (1950), Marine E., Esso Standard Oil Co. 1947 Westmoreland Drive, Baton Rouge, La.
- WILLIAM D. WALTHALL, (1950), E. E., R., Southern Bell Tel. & Tel. Co., Baton Rouge, La.
- GEORGE B. WALTHER, JR., (1948), Agricultural E., Cities Service Refining Corp. 444 Tenth St., Lake Charles, La.
- ALBERT R. WALTON, (1950), Surveyor, R. Self-employed. 1537 Highlands Ave., Shreveport, La.
- PHILIP W. WANG, (1952), C. E., R. Tex. Matheison Chemical Corp., Lake Charles, La.
- JOHN L. WANTLAND, (J), (1949), M. E., R. La. Polytechnic Institute, Ruston, La.
- RICHARD R. L. WARD, (1947), M. E., R., Texas, La., Cit-Con Oil Corp., P. O. Box 1578, Lake Charles, La.
- WALTER SCOTT WARE, (A), (1950), M. E. Negley Bag & Paper Co. 206 Lincoln St., West Monroe, La.
- FRANCIS J. WARREN, JR., (J), (1950), E. E., R., U.S. Navy. 2933 Cambronne St., New Orleans 18.
- JAMES S. WARREN, (1950), E. E., R., Southern Bell Tel. & Tel. Co., Houma, La.
- SAMUEL R. WARRINER, JR., (J), (1951), M. E., Warriner Equipment Co., 504 Delta Bldg., New Orleans 12.
- JOSEPH H. WATERFIELD, (J), (1952), Corrosion E., United Gas Corp., Lake Charles, La.
- L. T. WATKINS, (J), (1951), C. E., Missouri Pacific R.R. 926 W. Kleberg. Kingsville, Texas.
- MAX P. WATSON, (1944), M. E., E. E., Petroleum E., R. United Gas Pipe Line Co., P.O. Box 1628, New Orleans 11.
- CALVIN T. WATTS, (1948), C. E., R., Louisiana Dept. of Public Works. 506 Centenary Drive, Baton Rouge.
- CHARLES H. WEATHERLY, (1945), M. E., General Electric Co. 217 Washington St., Marblehead, Mass.
- JOHN H. F. WEBERT, (1928), Structural E., Jones & Laughlin Steel Corp 4115 Clermont Drive, New Orleans 22.
- ALPERT H. WEHE, JR., (J), Ch. E. Address unknown.
- IRWIN C. WEIDIG, (1951), E. E., R., La. Power & Light Co. 4317 Orleans Ave., New Orleans, La.
- LEO S. WEIL, (L.M.), (1920), M. E., R., Leo S. Weil and Walter B. Moses. 600 Audubon Bldg, New Orleans 16.
- FRANK WEISER, (1952), M. E., R., U.S. Dept. of Agriculture. 2100 Robert E Lee Blvd., New Orleans 17.
- BILLY A. WEISFELD, (J), (1951), E. E., R., Chrysler Corp. Michaud Ordnance Plant. 102 Livingston Place, New Orleans 20.
- THOMAS J. WEISHAUP, (1952), C. E., U.S. Bureau Public Roads. 321 Maestri Drive, Baton Rouge, La.
- FRED E. WELCH, (1949), Maintenance E., La. Dept. of Highways. Mill St., Rt. 1, Box 93, Natchitoches, La.
- EDWARD J. WELSCH, JR., (1952), C. E., R. J. Gordon Lee. 5710 General Diaz St., New Orleans 19.
- LESTER E. WENK, (1952), E. E., R., Wenk Electric Service. 230. E. Slattery Blvd., Shreveport 6.
- WILLIAM WENNER, (1947), C. E., Cities Service Refining Corp. 1325 12th St., Lake Charles, La.
- CHARLES R. WESTERCHIL, (J), (1950), C. E., R., Gravier & Harper, Contractors. P.O. Box 851, Alexandria, La.
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- JOHN R. WHIPPLE, (1951), E. E., R., La., Ohio. Ogden & Woodruff. 1370 Stephens Ave., Baton Rouge, La.
- WILLIAM WHIPPLE, (1936), M. E., La. State University. P. O. Box 8524, University Station, Baton Rouge 3.
- WILL A. WHITAKER, (1945), M. E., E. E., R., Standard Oil Co. of N. J., La. Div. 1167 Main St., Baton Rouge 8.
- J. LESTER WHITE, (1937), C. E., R. Dept. Public Works, City of Baton Rouge. 1041 Camellia Ave., Baton Rouge, La.
- O. D. WHITE, (1950), C. E., R. La. Dept. of Highways. Box 872, Alexandria, La.
- CARL B. WHYTE, (1946), C. E., E. E., M. E., R., La., Tex., Ill. Procon Incorporated, 75 E. Jackson Blvd., Chicago 4, Ill.
- CHARLES Q. WIGGINS, JR., (1946), E. E., R., Tex. Cary B. Gamble & Associates. 145 Wren St., New Orleans 19.
- RUSSELL J. WILDEY, (A), (1950), U.S. Army. HQTRS. 7822, S.C.V. Nuremberg Dist. APO 696, N. Y.
- CLAUDE D. WILKERSON, (J), (1950), M. E., Hdqtrs. Japan Central Exchange, A.P.O. 503, San Francisco.
- RICHARD KNOWLES WILKERSON, (1943), Gulf States Utilities Co. 2480 Liberty St., Beaumont, Texas.
- JOHN D. WILKINSON II, (J), (1949), Surveyor, R., Private Practice. 811 Washington, Marshall, Tex.
- ROGER C. WILKINSON, (J), (1951), J. C. McLemore Co. 2732 Marquette St., Shreveport, La.
- LAWRENCE V. WILLEY, (1939), C. E., R., La. Dept. of Highways. 430 Centenary Drive., Baton Rouge 2.
- AARON D. WILLIAMS, JR., (1949), C. E., R., Columbian Gasoline Corp. P.O. Box 1562, Monroe, La.
- GERALD C. WILLIAMS, (1940), M. E., Esso Standard Oil Co. 1882 Cedardale Ave., Baton Rouge, La.
- MELVIN C. WILLIAMS, (J), (1952), C. E., R., College of Engineering, L.S.U., Baton Rouge 3.
- 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 13.
- ROBERT O. WILLIAMS, (1951), E. E., R., Southern Bell Tel. & Tel. Co. 315 Dalzell St., Shreveport, La.
- ROBERT W. WILLIAMS, (1940), Ch. E., Esso Standard Oil Co. La. Div. 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.
- GEORGE F. WILLIAMSON, (1939), C. E., R., Palmer & Baker, Inc. 427 Nat'l. Bank of Commerce, New Orleans 12.
- ROBERT B. WILLIAMSON, (1951), E. E., R., Williamson Sales Co., Box 1223, Shreveport, La.
- 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., (J), 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., (1925), C. E., Jones & Laughlin Steel Corp., P. O. Box 66, New Orleans 6, 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. 4510 S. Prieur St., New Orleans 15.
- 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. 3170 Florida St., Baton Rouge, La.
- 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., Lutchet, La.
- THOMAS A. WOODWARD, (1952), E. E., Central La. Electric Co. Mansfield, La.
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 CHARLES J. WYLER, (L.M.), (1919), M.E., R., A. M. Lockett & Co., Ltd. 530 Jackson Ave., New Orleans 13.
 ROBERT S. WYNN, (1947), E. E., R., La. Polytechnic Institute, Box 381, Tech Station, Ruston, La.

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. 404 Washington St., Shreveport, La.
 ALBERTA M. YOUNG, (1951), Petroleum E., R., Private Practice. 1208 Pere Marquette Bldg., New Orleans 12.
 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., (J), (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 1.
 ROBERT W. ZIIFLE, (1937), New Orleans Public Service, Inc. 715 Pelican Ave., New Orleans 14.
 T. H. ZUMWALT, (1944), C. E., R., La., Tex. Freeport Sulphur Co. 161 Beverly Drive, New Orleans 20.
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D. S. Anderson.....	1912	William H. Rhodes.....	1940
*A. M. Shaw.....	1913	David W. Stewart.....	1941
W. H. Williams.....	1914	C. Glenn Cappel.....	1942
*L. O. Datz.....	1915	Karl P. Kammer.....	1943
*Samuel M. Young.....	1916	Charles M. Kerr.....	1944
A. T. Dusenbury.....	1917	Reinhard A. Steinmayer.....	1945
*John Klorer.....	1918	Leo Jos. Lassalle.....	1946
Ole K. Olsen.....	1919	Clayton L. Nairne.....	1947
John Riess	1920	W. Stone Leake.....	1948
R. S. Manley.....	1921	Herman L. Lehmann.....	1949
Donald Derickson	1922	Lionel J. Cucullu.....	1950
*J. S. Bareli.....	1923	Harry P. Newton.....	1951
James M. Robert.....	1924	John A. McNiven.....	1952
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MINUTES OF THE MEETINGS AND BUSINESS OF THE SOCIETY

Minutes of Meeting of the Board of Direction held on Monday, Feb. 9, 1953

The meeting was called to order by President Abraham, with Messrs. Kelly, Macdonald, Nelson, Perrilliat, Seago and Fernandez present. Mr. Macdonald moved that minutes of the meeting of January 8 be accepted as read, seconded by Mr. Seago and carried. Mr. Perrilliat moved that minutes of the meeting of January 9 be accepted as read, seconded by Mr. Nelson and carried.

Mr. Macdonald, Chairman, Finance Committee, submitted a budget for 1953, which was accepted upon motion by Mr. Kelly, seconded by Mr. Nelson.

A report of the Employment Committee for 1952 was read and accepted.

Correspondence from the National Laboratories, submitting an advertisement for insertion in the Proceedings was read. It was decided not to accept same for publication because the copy concerned a patent medicine and had no relation to engineering.

A letter from Bastian Bros. Co., offering to quote prices on a lapel emblem for the Society was read. The secretary was instructed to obtain their quotation, while the president would appoint a committee to secure bids from local jewelers.

The resignation of Bryan J. Lehmann was accepted with regret upon motion by Mr. Macdonald, seconded by Mr. Nelson, and Messrs. John V. Mutchler and Lawrence E. Creasy were dropped from the rolls at their own request by the same motion.

President Abraham read a letter from Mr. Alvin M. Fromherz concerning the annual banquet, following which he appointed Messrs. Claiborne Perrilliat, Clifford King, and Tom Fromherz to make recommendations for the improvement of future banquets.

The president read correspondence from the Federal Civil Defense Administration and agreed to answer same.

Upon the recommendation of the Board, President Abraham appointed the following standing committee personnel:

Employment—Raymond P. Bassich, Chairman; Eugene L. Fithian, Vice-Chairman.

Finance—Frank W. Macdonald, chairman; John A. McNiven, Vice-Chairman.

Membership Qualifications—(Anonymous).

Publications—Arthur M. Hill, Chairman; Allen H. Jensen, Vice-Chairman.

Entertainment and Outing—DeWitt L. Morris, Chairman; Sydney Ellis, Jr., Vice-Chairman.

Membership—Benton P. Babin, Chairman; Soule Butler, Vice-Chairman.

Legislative—Ben T. Bogard, Chairman; Frederick N. Billingsley, Vice-Chairman.

Publicity—John G. Bedell, Chairman; Aaron Abramson, Vice-Chairman.

Professional, Civic and Ind. Affairs—Reinhard A. Steinmayer, Chairman; Arthur J. Naquin, Vice-Chairman.

Honors and Awards—Jeffrey H. Collins, Sr., Chairman.

Section Coordination—Roy T. Sessums, Chairman; W. Stone Leake, Vice-Chairman.

Technical Papers—John F. Vogt, Jr., Chairman.

Vocational Guidance—Lionel J. Cucullu, Chairman; Charles P. Knost, Vice-Chairman.

Professional Study—Felix L. Alcus, Chairman.

Special Activities—C. Glenn Cappel, Chairman.

Messrs. A. W. Durning and Henri J. Molaison were appointed to represent the Society at the Engineers' Club.

The president appointed Messrs. Charles Crawford, Chairman, and T. Benbury Lockett to write a memorial resolution in honor of the late Calender F. Hadden, and Messrs. Ernest L. Mire and Stanley Lecourt to prepare a similar resolution for the late Ernest Couloheras.

Mr. Nelson reported that he and Mr. Sydney Ellis, Jr. were working to publicize Engineers' Week and recommended that next year a committee be appointed earlier for this project. There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of State-Wide Meeting of L.E.S. Held Jointly with N. O. Section, A.S.M.E. February 9, 1953

The meeting was called to order by President Abraham with approximately 85 members and guests present. Reverend W. Warrin Fay, Assistant Rector, Trinity Church, gave the invocation, and the president then welcomed members and guests of A.S.M.E. Mr. Seago moved that the reading of minutes of the preceding meeting be dispensed with, seconded by Mr. Stewart and carried. The secretary then read minutes of the board meeting of January 9.

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President Abraham advised that those members who have received questionnaires from "Who's Who In Engineering" need not hesitate to fill them out, since no obligation would be incurred by so doing.

The secretary then read an obituary of the late Grover C. Rackerby, and Mr. F. N. Billingsley read a similar document for the Society's late member and former president Bernard H. Grehan. Copies of each are attached to these minutes. A moment of silence then was observed in memory of the deceased.

Mr. R. P. Lockett, Jr., Chairman of the local section of A.S.M.E., introduced the other officers and members of his board.

Messrs. James M. Todd, Head Moderator, Lee H. Johnson and Lionel J. Cucullu then came to the microphone, telephone connections were made, and a state-wide panel discussion on "Engineers in Education" began. Participating at other locations were General Troy L. Middleton, Dean Leo J. Lassalle and Mr. Charles Leet, Baton Rouge; Dr. Joel Fletcher, Dean F. W. zurBurg and Mr. J. I. Jarman, Lafayette; Dr. L. E. Fraser and Mr. Russell Clark, Lake Charles; Dr. R. L. Ropp, Dr. W. R. Woolrich and Dean Ben T. Bogard, Monroe. Alexandria also participated in the program though no speakers were designated at that location.

After the hook-up time had expired discussion continued in New Orleans, and the evening ended with the usual refreshments and social hour.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Board of Direction Held on Monday, March 9, 1953

The meeting was called to order by President Abraham, with Messrs. Landry, Macdonald, McNiven, Nelson, Perrilliat, Seago and Fernandez present. Mr. Perrilliat moved that minutes of the preceding meeting be accepted as read, seconded by Mr. Landry and carried.

A report on the Annual Meeting submitted by Mr. W. J. Drawe, Jr., General Chairman, was read, and the secretary was instructed to thank Mr. Drawe and his committee in behalf of the Board for the splendid work accomplished for the annual meeting.

Mr. Macdonald moved that Mr. David Moodie be appointed General Chairman of the 1954 Annual Meeting and that Mr. Ivan Purinton be named chairman of the Technical Paper Committee. Motion seconded by Mr. McNiven and carried.

A report on Engineers' Week submitted by Mr. Sydney Ellis was read. Mr. Perrilliat moved that Messrs. Ellis and Nelson be thanked for their success in publicizing Engineers' Week. Motion seconded by Mr. Landry and carried. Mr. Landry then suggested that this work would be a good activity for the Section Coordination Committee. Upon the recommendation of the board, Mr. Nelson was appointed Chairman of the Engineers' Week Committee for 1954.

A letter from Mr. Gerald A. Newman, Consul of Canada and Trade Commissioner, requesting information in behalf of a Canadian engineering firm, was read and the secretary was instructed to reply to same.

Mr. Nelson moved that Mr. Marshall E. Naron be dropped from the membership rolls in accordance with his request, seconded by Mr. McNiven and carried.

A letter from Mr. G. B. S. Ricketts pertaining to the February state-wide meeting was read.

In accordance with the constitution, the following delinquent members whose addresses are unknown were dropped from the rolls upon motion by Mr. McNiven, seconded by Mr. Nelson and carried.

Ned J. Bond, Franklin D. Cardwell, John W. Cavanaugh, Robert S. Cooper, Wm. J. Dorman, Edward E. Evans, George C. Felton, William D. Fortner, Jack L. Hicks, John A. Judice, Joseph C. Mehrhoff, N. R. Mestepey, J. M. Miazza, Charles F. Negley, John S. Norton, Clarence J. Roberts, E. E. Shafer, William David Smith, Orlando W. Stephenson, Jr., Allan H. Sykes, Albert B. Triche, Jesse C. Watson.

President Abraham reported that Dean Bogard of Louisiana Polytechnic Institute had discussed with him the matter of compensation for engineering teachers, and had requested that the L.E.S. recommend to the State Board of Education that such compensation be increased. The discussion which followed included compensation for engineering employees in state civil service and fees and salaries for professional engineers. It was decided to delay action on this matter until a special meeting could be held in the near future.

Mr. Landry announced that the June meeting, regularly held in Baton Rouge and sponsored by that section, would take place on June 20 and this year would be a joint meeting with the Alexandria and Lafayette Sections.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

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New Orleans, La.

Minutes of Regular Meeting of the Society Held on Monday, March 9, 1953

The meeting was called to order by President Abraham, with approximately 40 persons in attendance. The president welcomed members and guests. Mr. Seago moved that the reading of minutes of the preceding meeting be dispensed with, seconded by Mr. Nelson and carried. The secretary then read minutes of the board meeting of February 9.

Mr. Waldemar Nelson reported on Engineers' Week, after which Mr. Sydney Ellis, Chairman of Engineers' Week Committee, presented a wire recording of one of the programs broadcast. President Abraham requested a rising vote of thanks from the audience for the committee's splendid work, which was promptly given.

Mr. Arthur J. Naquin then read an obituary of the late Gus C. Kraus. Followed by a moment of silence in memory of the deceased. Mr. Naquin then moved that the obituary be included in the minutes of the Society and a copy forwarded to the family of the departed member. Motion seconded by Mr. Vogt and carried.

President Abraham then requested Mr. Wm. J. Drawe, Jr., to take a bow in recognition of his splendid work on the 1953 Annual Meeting.

Mr. John Burke then introduced the main speaker of the evening, Mr. Thomas A. Stokes, Chairman, New Orleans Section, American Society of Refrigerating Engineers, who spoke on "Vertical Air Distribution in Buildings". Following the usual question period, the meeting adjourned with a rising vote of thanks to the speaker.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Special Meeting of the Board of Direction Held on March 23, 1953

The meeting was called to order by President Abraham with Messrs. Macdonald, Molaison, Gillen, McNiven, Landry, Seago, Kelly, Bonnet and Fernandez present. Messrs. Cucullu, Dornblatt, Innes and Sessums also were present by invitation. The president announced that this special meeting had been called to study

- (1) State of Louisiana Civil Service Classifications.
- (2) Salaries of engineering faculties in Louisiana colleges.
- (3) A proposed educational program for L.E.S. members.

Mr. Sessums then distributed copies of the latest engineering job specifications which have just been submitted to the Louisiana Department of Civil Service, and Mr. McNiven reported on the meeting held in Baton Rouge by the department.

The secretary read a letter from the Mississippi Society of Professional Engineers and presented their recommended schedule of engineering fees and salaries. A salary-and-income-survey questionnaire presently being circulated by the National Society of Professional Engineers also was presented. After much discussion, Mr. Nelson moved that the L.E.S. make a study of current engineering salaries and to make its results available to the state civil service department; said study to include salaried engineers in the following classifications: industries, utilities, contractors, public agencies, engineering schools, consultants, sales; and that these classifications be further divided into the various branches of engineering such as civil, mechanical, etc., age after graduation, geographic location, and grades of responsibility. The motion was seconded by Mr. Macdonald and carried. It was stated that this should be a continuous study because of the fluctuation in salaries due to economic conditions. It also was suggested that the basic study incorporating most of the work might be done by a graduate student in economics for his thesis.

The second item on the agenda, engineering faculty salaries, was discussed. President Abraham reported that Dean Bogard of Louisiana Polytechnic Institute had discussed with him the matter of compensation for engineering teachers and had requested that the L.E.S. recommend to the State Board of Education that such compensation be increased. The president then circulated a chart showing salaries for the teaching profession in Texas, Mississippi and Louisiana. Much discussion followed and Mr. Sessums pointed out that the chart appeared to have overlooked a raise in salaries going into effect in the fall of 1953.

Mr. Dornblatt suggested that the Society write to the State Board of Education, stating that an inquiry concerning engineering faculty salaries had been received and a committee subsequently had been appointed to study the subject, and that the L.E.S. would be happy to serve the Board in this connection.

Mr. Cucullu suggested that a plan could be worked out, particularly for Tulane and Louisiana State University faculty members, by which industry could employ teachers during the three-month summer period on a recurrent basis. In this way the faculty could count on a supplementary income and industry could count on their services. Mr. Macdonald then moved that a committee be appointed to explore the possibilities of industry employing faculty members on a recurrent service basis during the summer months. The motion was seconded by Mr. Seago and carried.



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Item 3, an educational program of refresher courses for L.E.S. members, then was brought up. President Abraham outlined a plan whereby the universities of the state would provide basic refresher courses by correspondence to members of L.E.S. at a nominal fee. These would be condensed courses, consisting of twelve lessons over a period of twelve months, and would not provide any college credits. Each university would offer one course, and those members of the Society participating would be encouraged to meet and hold discussion sessions. It was felt that such conferences would be most beneficial.

Mr. Landry circulated literature on correspondence courses now offered by L.S.U. and stated that Dean Morris of the Extension University had informed him that such a program could be included in his present schedule.

Mr. Nelson moved that the educational program outlined by President Abraham be studied by a special committee, and if its findings prove favorable the plan be accepted provided the program is self-sustaining. The motion was seconded by Mr. Landry and carried.

President Abraham read a letter from Mr. Walter Cooke proposing the formation of a city-wide committee to attend hearings on proposed changes in the City Building Code. Mr. Macdonald moved that the Society be represented on this committee, seconded by Mr. Kelly and carried.

The meeting then adjourned because of the lateness of the hour.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes Alexandria Section Louisiana Engineering Society, February 9, 1953

The meeting was called to order by President E. Hogge at 8:25 o'clock p. m.

This meeting night was on the night of the Open Forum meeting which lasted from 8:30 to 9:30 p. m.

With the introduction of each member and his guest, the meeting was opened.

Following the Open Forum, refreshments were served, during which time the group was entertained with piano selections by Miss Carol Ann Strother of Bolton High School.

A short business meeting was held after the social interlude.

The Minutes of the last meeting were read by the Secretary, and approved.

A rising vote of thanks was given to the Ladies' Auxiliary, Bill Keating, and Miss Strother for their help in making the Open Forum a success.

Bill Roland collected \$16.50 from members of the society for the expense incurred by the Auxiliary.

Bill Roland withdrew his motion from the November Minutes, and made a new motion that the Section set the third Thursday of each month for its regular meeting night. This motion was voted on, and passed.

There being no further business, the meeting was adjourned.

NEWTON HIMEL, Secretary-Treasurer

Minutes Alexandria Section Louisiana Engineering Society, March 19, 1953

The meeting was called to order by President E. Hogge, 8:00 o'clock p. m.

The minutes of the previous meeting were read by the Secretary and approved.

President E. Hogge gave a summary of the Tri-Section Meeting that was held on the Louisiana Tech campus March 3, 1953.

Tom David made a motion that the Parent Organization send details on President Abraham's idea before Alexandria Section takes any action. Motion voted on and carried.

President Hogge read a letter from President Abraham on Civilian Defense. Mr. David made a motion that Mr. Hogge notify Civilian Defense that the Local Chapter will cooperate with them. A list of membership will be supplied, and notified that the members will help in their respective fields. Motion seconded and carried.

There being no further business, the meeting was adjourned.

NEWTON HIMEL, Secretary-Treasurer

Minutes Alexandria Section Louisiana Engineering Society April 16, 1953

The meeting was called to order by President E. Hogge at 7:45 o'clock p. m.

The minutes for the previous meeting were read by the Secretary and approved.

President Hogge read a letter from President Abraham on his thoughts about refresher papers on various engineering problems prepared by the various college professors.

Mr. Barron made a motion that the Alexandria Section is in favor of supporting President Abraham's program for refresher courses in engineering problems. The motion was seconded and carried.

Mr. Melancon gave a report on vocational guidance.

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A motion was made that the Club purchase and set up a set of books for the club with the club paying the expense which was seconded and carried. It was suggested that the Minutes along with the number present be sent in to the Parent Organization. (16 present).

Horace Guillory made a talk on "Evolution of Power Plants"
Meeting adjourned.

NEWTON HIMEL, Secretary-Treasurer

Minutes Lafayette Section Louisiana Engineering Society, February, 1953

The meeting was called to order by the President, Allen Bonnet, at 8 p. m. in the Auditorium of the F. M. Hamilton Training School. The President asked for the reading of the minutes and they were approved as read. Under the heading of new business the March meeting was discussed and it was moved by Felix Boudreaux and seconded by L. C. Landry that a dutch dinner meeting be held. This was approved by the group.

Following this, the guest member of the panel, President Joel L. Fletcher, was introduced to the group. The other members of the panel were, Dean F. W. zurBurg, and Mr. J. E. Parman with Allen Bonnet acting as moderator.

At 8:30 the statewide hook-up meeting was called to order by Pres. Michael Abrahm. Mr. James M. Todd then spoke a few words on the shortage of Engineers and he introduced the members of the Panel in N. O., Baton Rouge, Monroe, Lafayette, and Lake Charles and the moderators at these various places.

A question and answer period followed and the following questions were asked to the members of the Lafayette panel:

To Dean zurBurg: Are faculty members who are employed to teach nine months encouraged to (a) do industrial work, (b) do consulting work, (c) further their education?

To President Fletcher: How can local industries participate in engineering educational activities?

After this question and answer period Mr. Todd closed the Statewide meeting by asking each moderator the number present at the meeting.

The Lafayette Section continued a discussion of engineering education for a brief period following the statewide meeting.

In closing President Allen Bonnet thanked the panel members and the telephone men for their splendid work.

EMERY DOMINGUE, Secretary-Treasurer

Minutes Lafayette Section Louisiana Engineering Society, March 10, 1953

The meeting was called to order by the President, Allen Bonnet, in the dining room of "Poor Boy's Riverside Inn" at 8:00 p. m.

Under the heading of new business Mr. J. R. Gaugler announced that the program committee had arranged to have Mr. Roy Sessions, as guest speaker for the May meeting.

Mr. Felix Boudreaux then moved to discuss the matter of having more dinner meetings.

After this discussion the dedication program of the New Chemistry Building at S.L.I. was brought before the group by the President and he stated that the Lafayette Section of L.E.S. had been asked to participate in this program and asked for suggestions from the group. Hearing no suggestions he then named the nominating committee. This committee will be composed of the following members:

R. T. Brooks, Chairman; Bob Harrison and Tom Cambre.

The meeting was then turned over to Mr. Bob Harrison who introduced the speaker, Mr. B. F. Hatfield. Mr. Hatfield gave a very interesting talk on "Nation-Wide Toll Dialing".

After a question and answer period the meeting was adjourned.

EMERY DOMINGUE, Secretary-Treasurer

Minutes Lafayette Section Louisiana Engineering Society, April 18, 1953

The meeting took place at 9:30 a. m. on April 18, 1953 in the New Chemistry Building, Montgomery Hall, at S.L.I.

No business was conducted at this meeting since it was merely a participation of L.E.S. members in the Symposium held as part of the Dedication of Montgomery Hall, the new Chemistry Building at S.L.I.

The program was as follows: Mr. Allen Bonnet, President, Lafayette Section of L.E.S. was the first speaker and he introduced to the group Dr. Elizabeth Rona, Senior Scientist, Special Training Division, Oak Park Institute of Nuclear Studies, Oak Ridge, Tenn. Dr. Rona spoke on "Radio Isotopes and their use in Industries of this region."

The third speaker was Mr. Lowell Betow representing the Southwestern Section, American Chemical Society, who introduced Mr. Clarence Oden, Chief Process Engineer, Cities Service Refinery, Lake Charles, La. Mr. Oden's topic was "The Effect of Chemistry and new college facilities on industry in this vicinity."

The fifth speaker was Mr. R. W. Krebs representing the Southwestern Section, American Institute of Chemical Engineers who introduced Mr. Claude

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Greensboro, N. C.

Arceneaux, Research Chemist, Ethyl Corporation, Detroit, Michigan, Mr. Arceneaux's topic was "The use of Photomicrography in Chemical Research as applied to Gasoline Production."

Mr. Roy T. Sessums, Director, Dept. of Public Works, State of La., was the last speaker on the program and he spoke on the "Importance of Chemical Engineering in the future development of industry in the state in particular, and the south as a whole." The meeting was then adjourned.

EMORY DOMINGUE, Secretary-Treasurer

Minutes Monroe Section Louisiana Engineering Society, March 3, 1953

The Monroe Section of the Louisiana Engineering Society met in Room B-35, Bogard Hall, Louisiana Polytechnic Institute, Ruston, La., March 3, 1953 at 6:30 p. m. The meeting was called to order by the Monroe Section President Mr. J. T. Folk, Sr.

Before beginning the business meeting a shrimp and oyster supper was enjoyed. Immediately following the supper a motion was offered, seconded and passed dispensing with the reading of the minutes from the previous meeting. Members and guests were asked to introduce themselves, indicating the Section of which they were members. This resulted in a count of thirty from the Monroe Section, six guests, four from the Alexandria Section, and two from the New Orleans Section who were the guest speakers of the evening.

After the introductions the meeting was turned over to Dean Ben T. Bogard of the Louisiana Tech school of engineering who gave a brief address of welcome and introduced the first speaker, Mr. John P. Fernandez, Secretary-Treasurer of the Louisiana Engineering Society, who used as his subject "The Why's and Wherefores of the Louisiana Engineering Society Make-up".

Following Mr. Fernandez address Dean Bogard introduced Mr. Michael C. Abrahm, President of the Louisiana Engineering Society, who spoke on "A Suggested Plan for Louisiana Engineers". Mr. Abrahm mentioned seven possible achievements the Society might consider, but for this meeting was principally interested in the possibility of the four engineering schools in the State sending out refresher courses to the practicing engineers in Louisiana in order that they improve in their knowledge of engineering in general rather than be restricted to their particular field of engineering. This developed a discussion and a question and answer period. At the close of the discussion a resolution was offered, seconded and passed recommending that this plan be given further consideration before the State Society at the next regular meeting.

It was announced that the next Monroe Section meeting would be in Monroe on June 2, 1953.

No further business was presented and the meeting was adjourned.

A. P. ANDREWS, Secretary-Treasurer

Minutes Shreveport Section Louisiana Engineering Society, March 3, 1953

The meeting was held in the cafeteria of the J. B. Beard Company and was called to order by President Gillen at 7 :00 p. m.

After a most enjoyable and much appreciated dinner Mr. Jeff Dykes introduced the featured speaker, Mr. Justin Wilson, safety engineer of Baton Rouge, Louisiana, who entertained us immeasurably with stories about the folks from the Cajun country of South Louisiana, also gave an interesting talk on the need for safety and how engineers can cooperate with safety men on jobs.

President Gillen thanked the J. B. Beard Company for the use of their cafeteria, suggested a fish fry this Spring at the Bossier Parish Police Jury's camp on Lake Bisteneau at which meeting wives and children of the members would be most welcome. Mr. Ellis concurred with the suggestion the felt that it should be held in the afternoon.

Secretary Synder read the minutes of the last meeting which were approved as read.

Secretary Snyder also read a letter from Mr. Fernandez regarding changes and finances.

Vice-President Hadra gave a report on the January, 1953, meeting of the Louisiana Engineering Society held in New Orleans.

Mr. Ellis moved that any excess of cost of this meeting over money collected from those attending be taken out of the treasury. Mr. Hadra seconded the motion which was unanimously carried.

Mr. Burchett invited the Section to hold a meeting at the Bossier Parish Police Jury camp previously mentioned.

There being no further business President Gillen gave the benediction and the meeting was adjourned.

MILLARD P. SNYDER, Secretary-Treasurer

PROCEEDINGS OF THE LOUISIANA ENGINEERING SOCIETY

JUNE, 1953

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PROCEEDINGS

OF THE

LOUISIANA ENGINEERING SOCIETY

Vol. 39

SEPTEMBER, 1953

No. 3

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An Important Opportunity for L.E.S. Members. Through the cooperation of the four Engineering Schools of this State, our Professional Study Committee is enabled to offer to the membership of the Louisiana Engineering Society a selection of subjects pertaining to various phases of the engineering profession. Only basic fundamentals and practical formulae will be offered in each subject. It is planned that data sheets are to be mailed to the participant, but he will not be required to mail back solved problems or answered questions.

It is the intent to offer easy-to-read, useful chapters in each subject, which may be filed and further useful as reference data. There will be no credit given by the Colleges for these studies, but it is the intent of LES to issue a certificate to each participant stating that he has subscribed to a particular course.

The Professors who have volunteered to prepare these courses will, of course, sacrifice their own time to do so. It is a contribution they have offered to the engineers of the State of Louisiana. Perhaps enough participants at a very nominal cost for each course will subscribe to make it worth while, financially, to the already heavily burdened engineering teachers.

The response of the engineering schools was very gratifying. Their's seem to be a sense of obligation to the welfare of fellow engineers which we, in industrial and other fields, should appreciate.

The following are the subjects offered: Applied Thermodynamics, Corrosion, Descriptive Geometry, Electric Instruments, Electricity, Engineering Drawing, Engineering Statics, Heat Power, Hydraulics, Machine Design, Nuclear Physics, Re-inforced Concrete Design, Soil Mechanics and Foundations, Use of the SR-4 Strain Gage and Stress Coat to Field Stress Problems.

The cost of each course, to extend through a year's period, is expected to be under \$10.00. Whether or not a subject will be given depends, of course, whether sufficient number of subscribers are obtained for that course.

M. C. ABRAHM, *President*
Louisiana Engineering Society

1954 Annual Meeting. Committee Chairmen and Vice-Chairmen.

David Moodie, General Chairman; A. W. Durning, General Vice-Chairman.

Banquet Committee: Charles M. Kerr, Chairman; Clifton R. Newlin, Vice-Chairman.

Contact with Woman's Auxiliary: Jules A. Lorio, Chairman; Mario G. Zervigon, Vice-Chairman.

Plant Inspection: Herbert C. Swan, Chairman; George William Hill, Vice-Chairman.

Program: Frank Riess, Chairman; Edward L. Schneider, Vice-Chairman.

Publicity: J. Mason Guillory, Chairman; Sydney Ellis, Jr., Vice-Chairman.

Registration: Albert J. Fransen, Chairman; Warren K. Bankston, Vice-Chairman.

Student Conference: Sam P. Gullatt, Jr., Chairman; John L. Martinez, Vice-Chairman.

Technical Papers: Ivan H. Purinton, Chairman; Lee H. Johnson, Vice-Chairman.

Reception: Lionel J. Cucullu, Chairman; Harry P. Newton, Vice-Chairman.

These members have been officially designated as Chairmen and Vice-Chairmen, but each looks to members of the respective committee and the members at large for assistance. Give help where you can; it is a tremendous job to work out all the details for the annual January meeting.

RESOLUTION. BE IT RESOLVED by the Louisiana State Board of Architectural Examiners and by the Louisiana State Board of Registration for Professional Engineers and Land Surveyors, in joint meeting on July 28, 1953, that the two Boards consider the

following statement to be a proper and correct outline of professional practice applicable to the professions of Architecture and Engineering and agree to exert their influence among the members of the respective professions to the end that these statements of principle may be followed throughout the professions.

1. That a registered Engineer should not have the privilege of calling himself or setting himself forth as an architect unless he is also a registered architect, meeting the requirements for such registration for the State of Louisiana, and that if he so designates himself as an architect without being registered, he is in violation of the law.

2. That a registered Architect should not have the privilege of calling himself or setting himself forth as an engineer unless he is also a registered engineer, meeting the requirements for such registration for the State of Louisiana, and that if he so designates himself as an engineer without being registered, he is in violation of the law.

3. That no architect or engineer shall approve, sign, or affix his name or seal as architect or engineer to any plan, specification, drawing or other related document which was not prepared by him or under his immediate supervision.

4. That no person other than a legally qualified architect shall use or employ the word "architect" or any term derived therefrom to describe himself, and that no person other than a legally qualified engineer shall use or employ the words "professional engineer" or any term derived therefrom to describe himself.

5. It is recognized that in certain fields of practice there is a broad overlap between the work of architects and engineers. This is particularly true in the field of buildings and similar structures. It is recognized that an architect who has complied with all of the current laws of Louisiana relating to the practice of Architecture, has a right to engage in activities properly classifiable as Professional Engineering insofar as it is necessarily incidental to his work as an architect. Likewise, it is recognized that the Professional Engineer who has complied with all of the current laws of Louisiana and is properly registered in that branch of engineering for which he may be qualified has the right to engage in activities properly classifiable as Architecture insofar as is necessarily incidental to his work as an engineer. Furthermore, the architect or the professional engineer as the case may be, shall assume all responsibility for compliance with all laws or ordinances relating to the designs or projects with which he may be engaged.

6. That a copy of this resolution be forwarded by the respective Boards to all the registered Architects and Engineers in Louisiana.

NEW MEMBERS

For Member

- OREN H. ATKINS**, Monroe; age 38. Endorsed: F. W. Adams, H. T. Poulan, A. D. Williams. Louisiana Polytechnic Institute, B.S., M&EE, 1938. Registered M.E., E.E., La. Associate Member, ASH&VE. Nat'l. Youth Admin., District Engineer, 1938-42. M. W. Kellogg Co., Field Engr., 1942-44. Cities Service Refining Corp., General Eng., 1944-45. United Electric Service, Sales Engr., 1945-47. Pogue-Atkins Co., Inc., President, air-cond. & heating contracting, 1947-date.
- WILLIAM W. AYER, JR.**, Lake Charles; age 30. Endorsed: W. M. Davis, F. E. Charles, R. E. Burgess, V. E. Sicks. La. State University, B.S. Pet. Eng., 1948. Registered Pet. Engr., La. Member AIMME, Geology & Mining Society. Cities Service Refining Corp., Draftsman, Metal Inspector, Jr. Contract Engr., 1948-date.
- HAL C. BECKER**, New Orleans; age 31. Endorsed: A. M. Hill, J. K. Mayer, M. G. Zervigon. Tulane University, B.E. in E.E., 1942. Mass. Institute of Technology, Ultra High Frequency techniques, 1942. Tulane U. Graduate School, Physics, 1945 to date. Member AIEE, Institute Radio Engrs., Am. Phys. Society, American Ass'n. for Adv. of Science, Tau Beta Pi, Sigma Pi Sigma, Sigma Xi. Registered E.E., La. Radiotelephone, Amateur Radio licenses. Radiation Lab., M.I.T., Staff Member, 1942-45. Bendix Radio, Television research and Dev., 1945-46. Tulane University, Biophysics Institute, Graduate Student, 1947-48. Equitable Equipment Co., 1947-48. Radio Engineer, self-employed, 1948-49. Tulane University School of Medicine, Electronics Engineer, 1949-date. Southeast La. Hospital, Consultant, 1952-date. Asbeston Corp., Lecturer, Industrial Training Program, 1952-53.
- FRED C. BROWNLEE**, Monroe; age 41. Endorsed: D. X. Ellett, S. E. Huey, H. M. James. La. Polytechnic Institute, Eng., 1930-31. Registered M.E., La. Brownlee Trailer Co., design and Engineering of truck-trailers, 1931-36. Fruehauf Trailer Co., in charge of production, 1936-37. Weldmech Steel Products Co., Asst. Mgr. San Antonio Branch, 1939-41. M. Kaplan & Son, Asst. Mgr. charge of Steel Fabricating Div., 1941-date.
- JESSE COATES**, Baton Rouge; age 45. Endorsed: L. J. Lassalle, F. W. Macdonald, F. M. Taylor. Louisiana State University, B.S. Ch. E., 1928. Mass. Institute of Technology, Chem. Eng., 1929-30. University of Michigan, M.S. Ch.E., 1932; Ph.D. 1936. Registered Ch.E., La. Member Alpha Chi Sigma, Phi Lambda Upsilon, Sigma Xi, Tau Beta Pi, American Chemical Society, A.S.E.E., A.I.Ch.E. National Lbr. & Cresoting Co., Chemist, 1928-29. International Paper Co., Chemist, 1929. Meeker Sugar Refinery, Chemist, 1930. Texas Pacific Coal & Oil Co., Chem. Engr., 1932-33. United Gas Public Service Co., Chem. Engr., 1933-36. La. State University, 1936 to date, now Professor of Chemical Eng.
- HARRY L. DULA**, Lafayette; age 45. Endorsed: J. E. Jarman, C. E. Joubert, C. J. Russell, R. T. Brooks. Berea College, Ky., 1925-27, A.B. course. University of Kentucky, C.E., 1927-29. I.C.S. course in C.E., 1929-33 and Highway Eng., 1952-date. Member N.C. Society of Engineers, S.A.M.E., La. Highway Engrs. Ass'n. Registered C.E., La. N.C. Highway Dept., Instrumentman, 1929-33. N.C. ERA and WPA. Project Engineer, 1933-35. Long Creek Lodge Development, N.C., Field & Resident Engr., 1935-37. Private practice, 1937-40. Field and/or Resident Engr. on various defense projects, 1940-43. W. F. Freeman, Field Engr., 1943-47. War Dept., U.S. Zone, Germany, P-3 Civil Engr., 1947-48. La. Dept. of Highways, Jr. Project Engr., 1949-52. Barnard & Burk, Resident Engr., 1952-date.
- GEORGE H. FLOURNOY**, Lake Charles; age 45. Endorsed: F. E. Charles, W. M. Davis, C. E. Grafton. Trinity University, Major Math., 1927-29. 1932-33, B.A. degree. Gulf Research & Dev. Co. Head Surveyor, Gravimeter party, 1935-46. Cities Service Refining Corp., Draftsman, Designing, Contract Engineer, 1946-date.
- QUENTIN W. HARGROVE**, Shreveport; age 34. Endorsed: W. E. Fitzgerald, C. M. Hadra, W. C. Sorensen. La. Polytechnic Institute, B.S., M&EE, 1941. Registered M.E., E.E., La. U.S. Air Force, Staff Eng. Officer, 1941-45. United Air Lines, Aircraft Engr., 1945-47. Builders Supply Co., Sales Engr., 1947-49. Bayou Metal Products Co., self-employed, Jan.-June 1949. U.S. Air Force, Military Service, 1949-52. Peyton & Bosworth & E. M. Freeman Associates, Consulting Engr., 1952-53. Neild & Somdal Associates, Design of electrical and mechanical equipment, Jan. 1953-date.
- JOHN A. HEBERT**, Lake Charles; age 49. Endorsed: F. R. Adams, O. E. Barron, B. F. Hatfield. University of Chicago, 1923-24; University of N.C., 1922-23, 1925-26, B.A. Registered E.E., La. Southern Bell Tel. & Tel. Co., 1922-date, Draftsman, Jr. Engr., Supervising Engr., District Engr.

- ROBERT B. JAMES, New Orleans; age 38. Endorsed: M. C. Abrahm, L. J. Cucullu, A. L. Dunlap. Tulane University, B.E. in M.&E., 1937. Member Society Automotive Engrs. N.O. Public Service Inc., Student Engr., Experimental Engr., 1937-42. U.S. Army, Automotive Engr., Atlanta Ordnance Base, 1942. U.S. Navy, Lt. Cmdr., Supervisor of Shipbuilding Activity, 1942-46. N.O. Public Service Inc., Equipment Engr., Asst. Supt. of Equipment, 1952-date.
- D. W. JESSEN, Lake Charles; age 37. Endorsed: R. E. Burgess, T. T. Chenet, R. M. Vincent. La. State University, B.S.C.E., 1940. Freeport Sulphur Co., Field Engr., 1940-41 Solvay Process Co., Construction Supt., 1941-43. Matheison Chemical Corp. Project Engr., Asst. Plant Engr., 1943-47. Private practice of engineering, 1947 to date. Registered C.E., La. Associate member, ASCE; Member, SAME.
- CLIFFORD E. JOHNSON, Lafayette; age 44. Endorsed: R. T. Brooks, E. E. Guillot, J. E. Jarman. Registered C.E., La. Mbr. La. Highway Engrs. Ass'n. La. Highway Dept. Rodman, Inspector, Jr. and Sr. Instrumentman, 1931-42. Tremont & Gulf Railway Co., Asst. R.R. Engr., 1942-43. U.S. Navy, Petty Chief Officer, 1943-45. Tremont & Gulf Rwy., Asst. R.R. Engr., 1945-46. La. Dept. of Highways, 1946 to date, now Sr. Project Engineer.
- FRANK WILLIAM JONES, Baton Rouge; age 44. Endorsed: J. B. Coltharp, H. L. Landry, A. J. Mary. Correspondence courses in E.E., 1932-40. Lamar College, Math & Electrical Instrument courses, 1941. A & M College of Texas, E.E. courses, 1941-42. U.S. Navy CEC Corps, required electrical courses, 1942-45. Registered E.E., Texas, La. Member AIEE, U.S. Naval Reserve, CEC, Gulf States Utilities Co., 1941-42. U.S. Navy, CEC, Electrical Engr., 1942-45. Gulf States Utilities Co., Elec. Dist. Eng., 1945-49; General Line Foreman, 1949-date.
- WILLIAM R. McCOY, Monroe; age 29. Louisiana Polytechnic Institute, B.S. C.E., 1950. U.S. Army Corps of Engrs., Office Engr., 1950-date. Registered C.E., La. Jr. Mbr. ASCE.
- CLAIR V. MERRIAM, Baton Rouge; age 59. Endorsed: H. L. Landry, J. B. Coltharp, A. H. Douglas. University of Washington, B.S.E.E., 1922. Gulf States Utilities Co., Division Supt., Navasota, Tex., 1930-42; Division Mgr., Beaumont, 1942-48; Div. Mgr., Baton Rouge, 1948-date.
- LEO J. STROLE, Monroe; age 42. Endorsed: F. W. Adams, J. H. Huffman, L. C. Landry, Jr. Parson Jr. College, 1931-32. Warrensburg Teachers College, Mo., 1932-33. University of Kansas, Mech. Eng., 1933-34. Finlay Eng. College, M.E., 1935-37. Sr. Mbr. Nat'l Ass'n Corrosion Engrs. Professional experience, 16 yrs. United Gas Corp., Senior Engr., 1940 to date.
- WILLIAM H. THOMAS, Baton Rouge; age 33. Endorsed: O. D. Johnson, Jr., R. B. Nerf, G. L. Yousko. Virginia Polytechnic Institute, B.S.M.E. 1949. Esso Standard Oil Co., Maintenance Engr., Project Engr., 1949-date.

For Affiliate Member

- M. L. HARGUS, Monroe; age 46. Endorsed: F. W. Adams, S. E. Huey, J. H. Huffman, I.C.S. course in surveying and mapping, 1934. Ford, Bacon & Davis, Transistman and Asst. Party Chief, 1928-29. United Gas Public Service, Houston, Party Chief, Asst. Const. Engr., 1930-31. United Gas Pipe Line Co., La. Field Party Chief, 2 yrs. United Electric Service, Monroe, Air-conditioning, Heating & Insulation Sales Eng., 1946-49. Insulating contractor, 1949-date.
- VIRGIL O. SPILLERS, Monroe; age 26. Endorsed: F. W. Adams, J. H. Huffman, J. H. Waterfield. U.S. Navy, 7 yrs. (including courses in Mechanical Drawing). Contour and grade mapping for drainage purposes. United Gas Corp., Draftsman, 1952 to date.
- DANIEL L. WINTERS, New Iberia; age 48. Endorsed: T. A. Bonnet, M. G. Arnett, J. R. Gaugler. Southwestern La. Institute, B.S. (Chemistry major) 1924. Member American Waterworks Ass'n., La. Conference on Water Supply. Central La. Electric Co., Chemist, 1944-date.

For Junior Member

- GEORGE C. ADAMS, Alexandria; age 28. Endorsed: S. Butler, C. W. Cook, E. Levy. La. Polytechnic Institute, B.S.M.E., Jan. 1950. Charles T. Roberts, Architect, employed as Draftsman. City of Alexandria, Asst. Building Inspector, Nov. 1951 to date. Registered M.E., La.
- CHARLES H. FILGO, Baton Rouge; age 25. Endorsed: H. J. Hall, R. B. Nerf, G. L. Yousko. Mississippi State College, B.S.C.E., 1951. Esso Standard Oil Co., Project Engr., 1951-date.
- HERBERT M. RHODES III, Monroe; age 28. Endorsed: B. T. Bogard, T. R. Henry, A. D. Williams. U.S. Navy Electrical Communications School, 1944-45. La. Polytechnic Institute, 1945-51, B.S.E.E. Associate Member

AIEE. Registered E.E., La. Licensed Radiotelephone 1st class. U.S. Navy, maintenance of electrical, radio, radar equipment, 4 yrs. Ford, Bacon & Davis, E.E. design and layout, Jan.-Aug. 1951. Columbian Gasoline Corp., Aug. 1951-date, Electrical Engineer.

HERMAN SCHLUTER, J.R., Baton Rouge; age 28. Endorsed: E. R. Felton, R. B. Nerf, G. L. Yousko. Louisiana State University, B.S.E.E. 1950. Esso Standard Oil Co., Engineer, 1950-date.

PIERRE J. STOUSE, JR., New Orleans; age 26. Endorsed: R. H. Grehan, D. L. Morris, W. S. Nelson. Tulane University, B.E. in E.E., 1948. Associate Member AIEE. International Business Machines, Customer Engineer, 1948. N.O. Public Service Inc., Sales Engineer, 1949-51. Eaco, Inc., Lighting Specialist, June-Sept. 1951. Bedell & Nelson, Electrical Engineer, 1951-date.

RONALD J. ST. PIERRE, Baton Rouge; age 24. Endorsed: W. H. Carter, W. A. LeBlanc, W. D. Poole. La. State University, B.S. Agri. Eng., 1950. Member La. Agri. Engrs. Ass'n. Registered Agri. Engr., La. General Gas Corp., July-Dec. 1950. U.S. Army, active duty, 1951-52. General Gas Corp., Carburetion Engr., Jan. 1953-date.

Junior Membership Awards

BENJAMIN R. FARMER, JR., Ruston; Graduate in Petroleum Engineering, Louisiana Polytechnic Institute, 1953.

WILLIAM E. KIDD, JR., Baton Rouge; graduate in Mechanical Engineering, Louisiana State University, 1953.

JAMES RICHARD NEEF, Lafayette; graduate in Civil Engineering, South-western Louisiana Institute, 1953.

ROBERT E. WEAVER, New Orleans; graduate in Chemical Engineering, Tulane University, 1953.

1953 ANNUAL GOLF TOURNAMENT AND OUTING

Mr. Joe Riorda gives the following account of the annual outing, held on July 16 at the Colonial Country Club.

The outing, exclusive of weather, was a grand success. The large turn out for golf was amazing, considering the flooded condition of the course. The golf committee got together with a golf pro, and managed to pick out eight or ten of the playable holes.

Again, considering the weather, there was an excellent turn out for hoeshoe pitching.

There were many attractive prizes for both the horseshoes and golf.

The barbecue was held indoors, and was followed by an excellent floor show. The evening was concluded with the awarding of the prizes.

The total attendance was 216.

ATTENDANCE PRIZES — MEMBERS

Prize No.	Description	Donor	Won by
49	Deep Fat Fryer	Lionel F. Favret Co., Inc.	H. A. Canavier
30	Shakespeare Fishing Reel	Dixie Machine Welding & Metal Works	R. E. Gosa
26	West'house Elec. Iron	George Wm. Hill (WESCO)	Harold Favret
53	Kodak Camera	Bedell & Nelson	W. C. McClain
5	Arvin Radio	Gulf Engineering Co.	M. R. Guell
16	Teamaker	Boh Bros. Const. Co.	A. E. Bigler
12	Electric Clock	Perrilliat-Ricket Const. Co.	Ben Loovier
43	Btl. Scotch & Bourbon	Allis-Chalmer Mfg. Co.	C. J. Mayeux
1	Waffle Iron	Mason Guillory (NOPSI)	P. J. Stouse

Prize No.	Description	Donor	Won by
56	Aluminum Ice Bucket	Jones & Laughlin Steel Corp.	J. W. Sears
58	Tackle Box	Mexico Refractories	C. Green
57	Fryrite Deep Fat Fryer	N. O. Blueprine Co. & Eugene Dietzgen Co.	A. N. Crews
38	Ice Chest	C. G. Cappel	Bill Larkin
50	G. E. Automatic Iron	Eagle Abestos & Packing Co.	Al. Former
6	Toastmaster	E. G. Boh Forest Prod. Inc.	E. R. Cousins
24	Cory Knife Sharpener	Flintkote Co.	S. C. Buitt
59	Ice Chest	R. J. Tricon Co.	Dave Stewart
40	Garden Wheelbarrow	W. F. Surgi Equip. Corp.	J. W. Brown
48	Philco Portable Radio	Lester F. Alexander	Bill French
61	Bottle Bourbon	Charles P. Knost	B. J. Bell
33	Set Steak Knives	American Creosote Works	C. O. Lee
35	Bottle Bourbon	Petrolane Gas Co., Inc.	D. H. Levine
42	Electric Clock	James M. Todd	A. N. McIntosh
22	Waring Blendor	W. Horace Williams Co.	Russ Pardee
18	20" Reed Unit Fan	Reed Unit Fans Inc.	Stone Leake
63	Bottle Bourbon	John Riess	Al. Fransen

Additional attendance prizes purchased through money left over from donations after correct number of prizes and proper retail values of same.

Description	Won by
Pint Bourbon	Sidney Ellis
Pint Bourbon	R. Klinger
Pint Bourbon	E. H. Pavia
Pint Bourbon	Robert Grehan
Party Bucket	J. J. Farrell
Ice Bucket	Dave Moodie

HORSESHOE PITCHING PRIZES

SINGLES

Prize No.	Description	Donor	Won by
29	Set Steak Knives	George Dinwiddie (NOPSI)	Lee Johnson

SINGLES—RUNNER-UP

21	G. E. 12" Fan	A. M. Lockett & Co.	P. J. Stouse
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DOUBLES

25	Steam Iron	Shilstone Testing Lab.	H. Ford
27	Steam Iron	Bartley & Binnings	A. J. Loup

PARTICIPATION PRIZES

3	Garden Hose and Reel	J. H. Carter Co.	Thomas Nolan
42	Btl. Scotch & Bourbon	Pittsburgh Testing Lab.	R. Williams
28	Flint Holdster Set	Frank P. Fischer Eng. Co.	Francis Taylor
34	Fishing Reel (Shakespeare)	United Gas Pipe Line Co.	S. A. Nasen
55	Water Thermos Jug	Maritime Electric Co.	James Janssen

ATTENDANCE PRIZES — GUESTS

Prize No.	Description	Donor	Won by
36	Glass Fishing Rod	So. States Equip Co.	L. J. Cormack
52	Brownie Camera	W. T. Hess (La. P. & L. Co.)	W. McKernan
4	Electric Ovenette	Woodward-Wight & Co.	J. A. Roach
15	Silver Silent Butler	J. K. Woolf	L. T. Loughridge
60	Ice Chest	Taylor-Seidenbach, Inc.	Stanley Southerland

GOLF PRIZES

Prize No.	Description	Donor	Won by
PRESIDENT'S FLIGHT			
54	Silver Tray	M. C. Abrahm	J. M. Todd
GUESTS—NET PRIZES			
1st low net			
11	Silver Pitcher	Orleans Material & Equip. Co.	Bill Weidner
2nd low net			
31	Flint Holdster Set	Boland Machine & Mfg. Co.	G. P. Peagler
3rd low net			
37	Fishing Rod	Ole K. Olsen	H. J. Grumsky
GUESTS—GROSS PRIZES			
1st low gross			
13	Aluminum Ice Bucket	Avondale Marine Ways, Inc.	E. B. Estoup
2nd low gross			
39	Putting Set	N. O. Cement Products Co., Inc.	W. D. Taulman
MEMBERS—NET PRIZES			
1st low net			
46	Silver Pitcher	W. D. Taulman & Associates	M. E. Young
2nd low net			
14	Silver Ice Bucket	Eustis Engineering Co.	Dick Earl
3rd low net			
32	Set Steak Knives	Asbestone Corp.	W. M. Larkin
4th low net			
17	Travel Iron	Standard Supply & Hard. Co.	Wm. French
5th low net			
23	Cory Knife Sharpener	Freeport Sulphur Co.	J. S. Riorda
6th low net			
51	Light Meter	Chase Brass & Copper Co.	T. H. Nolan
7th low net			
41	Btl. Scotch & Bourbon	R. P. Farnsworth & Co., Inc.	John St. Raymond
8th low net			
20	Ice Chest	Byron-Jackson Co.	A. L. Farmer
9th low net			
19	Ice Crusher	R. E. Gosa	Ben Lockett
10th low net			
2	Bathroom Scale	Crane Co.	George Hammett
MEMBERS—GROSS PRIZES			
1st low gross			
47	Silver Tray	Equitable Equipment Co.	Bob Drueding
2nd low gross			
7	Silver Center Piece	Allen J. Harris Co.	Wm. Massimini
3rd low gross			
44	Dozen Golf Balls	Lone Star Cement Corp.	Henry Boh
CLOSEST TO HOLE NO. 7			
8	Silver Compote	General Electric Co.	Bob Drueding
CLOSEST TO HOLE NO. 14			
9	Silver Compote	Betz Engineering Sales Co.	F. F. Johnson
MEMBERS—HIGH GROSS			
10	Electric Clock	Edgar Murray Company	Roy Cappel

MULTI-ROOM AIR CONDITIONING*

O. H. Mehl*

There have been more new buildings built during the past six or seven years than at any time since the late 20's and early 30's. A large number of new buildings are now under construction and also still in the planning stage. There is, however, one major difference between new buildings of today and those built in earlier building booms and that is the fact that today's buildings are being air conditioned. Investors and planners are now recognizing that any new building without air conditioning is obsolete before it is started.

A large number of these buildings are sky-scrappers and the majority of these buildings can be classified as multi-room buildings. It is generally considered relatively simple to air condition a single room but multi-room buildings with spaces isolated from each other present control problems due to load variations and individual preferences that must be recognized.

The general public has been prone to think of air conditioning purely in terms of relief from summer heat. The inaccuracy of this assumption is heavily emphasized with the trend of modern design of multi-storied buildings. Extremely large glass areas, high lighting intensities and extreme height present problems of temperature control in all four seasons. Huge expanses of glass exposed to the sun create a need for cooling even in the middle of the winter. High lighting intensities make it necessary to supply cold air all the year around to the interior spaces. Stack effect in tall buildings presents a real problem for heating and ventilation on a uniform basis throughout the height of the building.

Many problems confront the air conditioning engineer when tackling a design for one of these buildings. He is subjected to considerable pressure to reduce space requirements for ducts and piping, yes even beyond the irreducible minimum. Building construction is expensive and the investors loudly object to paying good money for the mere housing of air. Not only are there loud objections to the use of vertical space for ducts but the horizontal ducts must also be squeezed down so that the floor to floor heights of the building can be reduced and reduced still further. Floor to floor heights of 12' 6" were comparatively common 25 years ago; now they are considerably less and some buildings are now being erected with as low as 9' 6" floor to floor heights. These space limitations are being met by adoption of high velocity air distribution systems, or all water cooling systems or combinations of both. Schemes have been worked out for actually running small ducts through the structural beams of some of the buildings. This

* Presented at L.E.S. Annual Meeting, Jan. 9, 1953.

was particularly effective in the United Nations Secretariat Building in New York.

Stack effect is probably one of the most difficult problems with which the designer is confronted. The static pressure difference between the top and bottom of a building is influenced by the wind velocity and direction as well as the tendency of the building to act as a chimney.

During winter operation the effect of the wind may be to increase the static pressure on one face of the building while on another face of the same building the wind may serve to decrease static pressure. Likewise at localized points such as the corners, eddy currents may cause more pressure at the sides of the building. In tall buildings the wind effects are much more pronounced than the weather bureau records would indicate, for such observations are usually taken at elevations of around 100 feet. Actually, due to freer movement and lack of obstruction, the velocity of the wind increases rapidly with an increase of elevation.

The wind velocity encountered on the upper floors of a 35 to 40 story building is approximately one and one-half times the velocity for ground level conditions. Bearing in mind that the velocity pressure increases approximately as the square of the velocity, the height of the building can thus be seen to have an important effect on the pressure exerted by the wind.

A tabulation shows the velocity pressure for various wind velocities. At ten miles per hour which is equal to 860 feet per minute the velocity pressure is only .05 inches. At thirty miles per hour the velocity is 2580 feet per minute but the velocity pressure is .42 inches.

The average winter wind velocity prevailing in various cities may be taken from the weather bureau records. These values are based on measurements at 100 feet elevation and are average only.

The pressure due to wind velocity is entirely separate from the pressure produced by stack effect. If there were no leakage through walls and windows, the building would act as a perfect chimney and the negative pressure due to stack effect would be directly related to the difference in weight between the column of warm air inside the building and the column of cold air outside the building. A 40 story building with 12 foot floor to floor height, for zero degree outside and 70 degree inside the building would produce a negative pressure of one inch of water at the base of the building if the building were perfectly tight.

Actually, all buildings have some cracks and openings in the walls and around the windows so that the condition of a perfect chimney is never met. Instead, the air leaks in on the lower floors and out on the upper floors. The static pressure in the lower half

of the building is negative and it is positive in the upper half. At some point near the middle of the building the pressure in the rooms just equals the outside pressure. This neutral point moves up and down slightly for various types of buildings due to unequal leakage on various floors.

The difficulty of establishing complete control of the rate of ventilation is now apparent. On a zero degree day in winter in a 40 story building unheated fresh air is trying to pull its way in the bottom of the building and second-hand stale air is trying to force its way out in the upper floors, with a total pressure in excess of 1 inch to establish flow.

With these tall buildings we also run into problems of hydro-static head on the water piping. For in our 40 story building with the 12 foot floor to floor ceiling heights the hydro-static head is equal to 208 lbs. It is usually considered advisable to divide a building of this nature into horizontal zones for water distribution to avoid the need for high pressure piping and accessories throughout the building.

Zoning of the exterior exposures of these modern design buildings is much more of a problem than formerly due to the extremely high percentage of glass area. The United Nations Building is a striking example, for the entire east exposure is glass. The actual effective glass area is 78% of the total wall area, for there is a band of glass at each floor level which does not radiate into the space. Actinic type glass is used to more effectively reradiate a portion of the solar heat gain to the outside, and to minimize glare for the occupants. The solar heat gain in the winter is of such magnitude that when the temperature is 40° and the space is occupied by people, cooling must be supplied to confine the temperature within the space to acceptable limits. Furthermore, should the sun pass behind a cloud the load balance can be reversed in the matter of minutes, thus making it necessary to heat instead of cool with almost equal rapidity.

Here is a list of the basic requirements for the air conditioning of a tall building as they might be laid down by the architect.

1. Controlled heating and/or cooling for all seasons.
2. Minimum use of a space,
3. Conformation to low ceiling heights.
4. Flexibility for tenant changes.
5. Controlled ventilation summer and winter.
7. Low maintenance cost.
6. Controlled humidity.
8. Low owning and operating cost.

How can we best satisfy these requirements? Systems are available today which adequately solve all these problems, but the present

designs were not developed without going through a lot of headaches. Sometimes we are prone to forget old lessons and therefore it might be of interest to retrace our steps about 25 years and consider the experiences which have lead up to the present methods available for air conditioning multi-story buildings.

It was perceived by Dr. Carrier in about 1927 that there was a real need for a device to introduce air into a conditioned space which could be adjusted either manually or automatically at the will of the occupant to provide temperature control. The ejector principle, wherein large volumes of secondary air are set into circulation by a high velocity jet of primary air had already been widely used in industrial applications. It was felt that the same principle could be applied to comfort air conditioning and the first induction unit was designed and built in 1927. This is a description of the first induction unit. Conditioned air was introduced into a plenum, then discharged through a nozzle at high velocity, thus causing a secondary circulation of room air to be induced into the bottom of the unit and mixed with the primary air to discharge at the top of the unit at normal velocity. Since the primary nozzle operated at a fairly high static pressure in order to develop the induction velocity, it was possible to control the volume of air at each outlet without materially affecting the flow from other outlets on the same system. Since the primary air was mixed in the induction unit with air from the room it was possible to use much colder air without producing drafts. This resulted in smaller ducts and equipment than heretofore used. This first unit was designed for mounting within a partition wall, consequently was quite inflexible with regard to partition changes. This provided a relatively adequate device for the summer cooling function, but did not take care of the winter heating requirements.

The next development was to place the radiator or heating surface in the path of the recirculated or induced air flow. This gave a greater flexibility of individual temperature control, at the same time satisfying the complete heating requirements. This also allowed summer flexibility, for the heating coil could be used as a reheating device if desired. Improved humidity control was also possible with this type of arrangement, for the moisture content of the primary air was fixed at a central station conditioning apparatus. This type of unit is still in production today and is generally known as the duct type Weathermaster Unit.

Many thousands of this type of induction Weathermaster unit have been installed. About nine years ago the 12,000 ton Pentagon Building in Washington, D. C. was air conditioned with this type of system using 7000 units.

The major disadvantage of this type of unit is the large space consumed by the air duct, for all of the cooling capacity is carried

by air and the velocity used in those days ran from 1000 to 2000 feet per minute. Thus in a multi-storied building loss of rentable space to make room for the ducts became quite a consideration.

During this same period in the early 30's another development was taking place,—the use of direct expansion or chilled water coils in individual fan units which could be located in individual spaces utilizing central station refrigeration. Carrier built the first units of this type in 1931. It was termed the atmospheric cabinet. The direct expansion type unit was particularly adaptable to small installations but the chilled water type of unit was superior for the larger jobs because of the lesser problems of running chilled water lines instead of refrigerant lines. This unit was equipped with both heating and cooling coils thus providing considerable flexibility.

The early type of fan cooler possessed several disadvantages which could not outweigh the major advantages of elimination of duct space and availability of heating as well as cooling. Chilled water was used for cooling and dehumidifying and in winter hot water could be used for heating, but both heating and cooling could not be obtained at the same time unless dual circuits were installed. Thus it was not possible to provide constant control of the humidity, for any reduction of sensible heat removal capacity achieved by throttling water supply resulted in less dehumidification, with a consequent rise in humidity in the space.

These early units were only equipped with low pressure fans which could do absolutely nothing to resist the stack effect of the building. In fact, the presence of the outside air intake had the effect of opening up the building to outside conditions, with the result that units on lower floors in multi-story buildings handled many times more outside air than designed for during winter operations, whereas units on the upper floors actually allowed air to flow out of the building instead of supplying air to the rooms.

We made further improvements on the fan coil unit, most important of which was the addition of a high pressure fan. This permitted use of static pressures on the individual fan discharges which were considerably in excess of any normal static pressure which might be existant at the fresh air intake whether it be positive or negative. The fan then functioned as a metering device which greatly limited the increase in air flow due to a positive pressure, and completely halted reversal of flow due to external negative static pressure.

Development of high fan pressures required very high rotational speeds of the fan wheel in order to produce the high tip speed necessary for high pressure. Noise problems then came into the picture and provided another operating disadvantage due to noisy operation.

It was also found that in northern climates it was necessary to protect the water coils in the units from freezing. This was easily solved by introducing anti-freeze mixtures into the circulating system but considerable expense was thereby incurred.

Maintenance became quite a headache with this type of unit. There were hundreds of fans and small fractional horsepower motors to service and keep running. Filter changing was another costly but necessary evil. For if the room dirt were permitted to accumulate on the wet coil, not only would performance soon suffer, but odors would accumulate. Some operators tried to simplify their problems by removing the filters, but they soon found that the dehumidifying soils, which were usually two or four rows in depth, were practically impossible to clean once the dirt got inside the bundle. Even under ordinary operation with good maintenance of filters, condensate drains had a tendency to clog up due to the accumulation of algae and other fungicidal growths, and unless the drain lines were periodically cleaned the condensate overflowed, frequently causing damage to floors and fancy rugs.

Now it can be seen that during the early 1930's there were two parallel developments taking place for the solution of the problem of air conditioning multi-story buildings.

1. The induction type unit offering simplicity and low maintenance but still requiring considerable duct space.
2. The fan type water coil unit offering the ultimate in space saving but having many undesirable maintenance problems and short equipment life.

Dr. Carrier then conceived the idea of using the major advantages of both systems in a single system. Why not use the high pressure induction nozzle with its inherent stability against stack effect and use the kinetic energy of the high pressure air stream to provide the motor power to propel air over the chilled water coil. The first system embodying this new idea was installed in an apartment house in Washington in 1938. The room unit which was used in this first installation was practically identical with the high pressure fan coil unit, except that the fan was omitted, and a duct connection was made to a central fan system supplying outside air for ventilation. Again, the two coils in the unit were connected in water series. The first coil was located in the primary air stream of raw outside air, which was dehumidified at the unit before emerging from the high pressure nozzles, which induced secondary air from the room over the second portion of the coil. Thus with one step the unit fan and motor and fresh air intake were eliminated. However, the dehumidifying function was still performed at the coil in the unit, and this still left the major problem of condensate removable. The two coils were connected

in series, so that dehumidification was performed only on the filtered outside air, and the secondary coil performed sensible cooling only on the induced circulation of room air. This eliminated the problem of odor accumulation.

There were considerable problems on this first job due to clogging of condensate drains. Floods occurred on several occasions which caused damage to floors. The cure on this particular job was found by the addition of partial dehumidification in the central supply system and in establishing a maintenance schedule for cleaning drains periodically. This first installation is still in operation at the present time.

The next major step was the elimination of the dehumidifying function from the room unit and transferring it to the central station plant which supplied the outside air for ventilation. This was the final step in the evolution of the Carrier Conduit Weather-master System of air conditioning, which has been found to be the answer to air conditioning problems in several hundred office buildings, hotels, hospitals and apartment houses.

We would like to now take a look at the problem of load variations in one of these modern buildings with large glass areas and high lighting intensity. Consider three rooms, (Fig. 1) designated as, A, B, and C for convenience all located on the same exposure. Room A is fully exposed to the East sun, has a load of two people and lighting at the rate of 3 watts per square foot, and for simplification of the problem the surrounding spaces are air conditioned. Room B is of similar dimensions and loading, the only difference is that it is now shaded from the sun due to the shadow of an adjacent building. Room C is also identical but in this case the occupants have vacated the room, and it is therefore subject to transmission losses only. These rooms are not necessarily adjacent to each other, but they may be located anywhere on a single exposure.

A chart (Fig. 2) shows an analysis of the heating or cooling load of these various rooms over the entire temperature range to which they will be subjected. The basis of load calculations is given in the upper right hand corner. Note that the actual glass area is 65% of the total outside wall area, and while this is an assumed value, it is not by any means the maximum percentage that may be encountered in some of these modern buildings. The United Nations Building, for instance, mentioned earlier, runs 78% glass area. Solar heat gain is computed for the East exposure for March 22nd or September 22nd which yields a value of 149 at 8:00 a.m. and to this we have applied a factor of .62 for the use of heat absorbing type glass and an additional factor of .73 for the use of venetian blinds, fully drawn, with the slats set at 45°. This

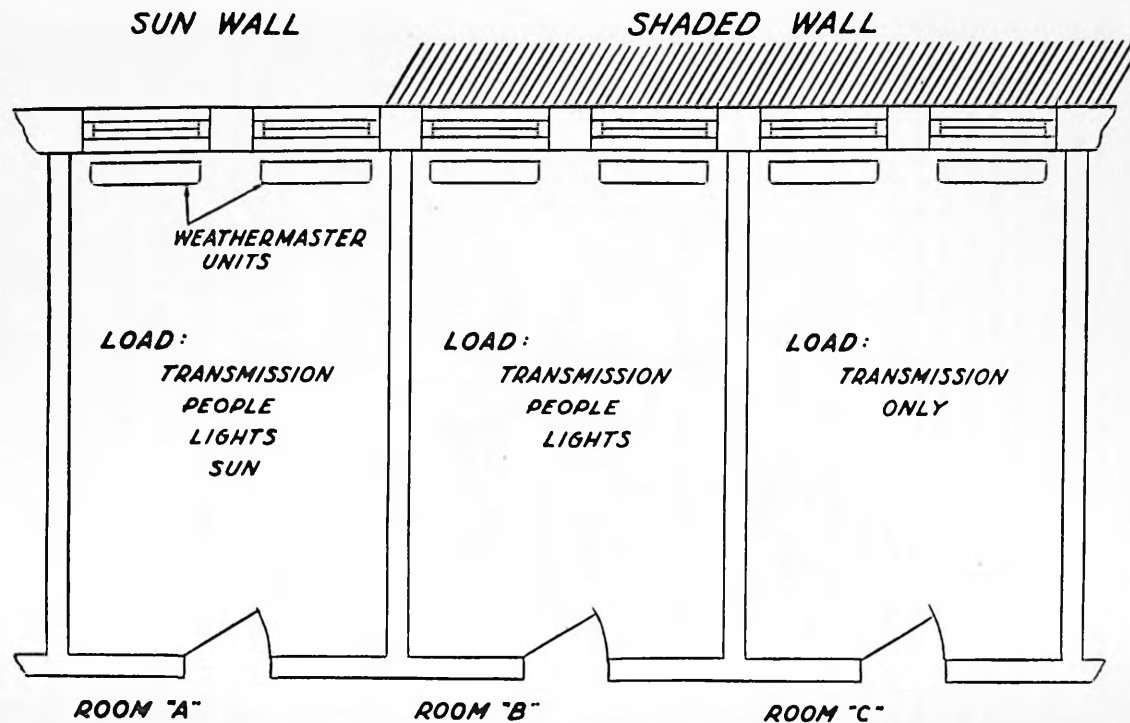
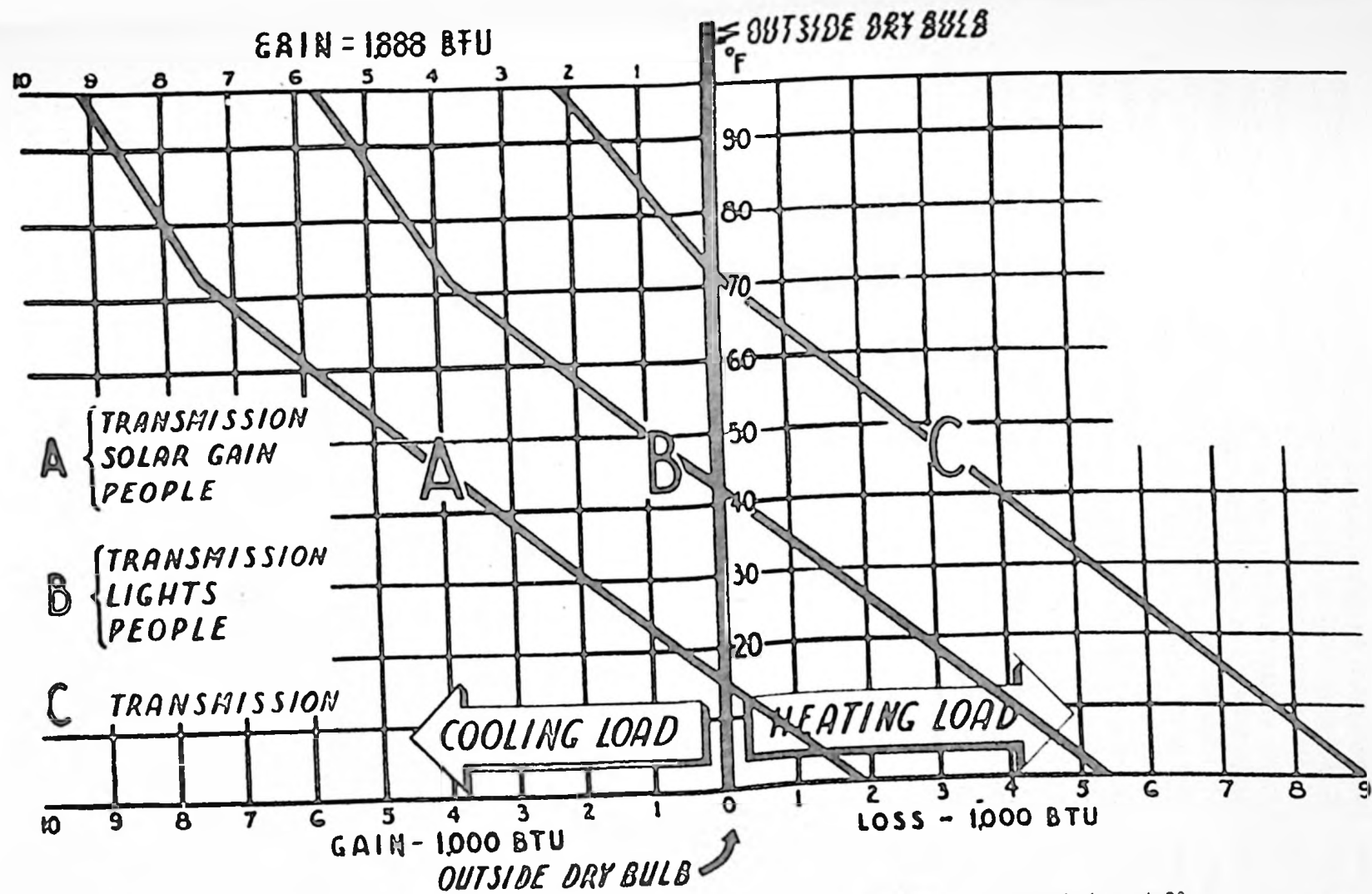


Figure 1 — Typical Plan of One Building Exposure



Transmission at 95°			Solar Gain 98 sq. ft. x 1.19 x 62 x .73 =	6600	Transmission at 0°	
Wall 54 sq. ft. x 10° x .25	BTU/HR.		Lights 320° x 3 x 3.4	= 3270	Wall 54 sq. ft. 72 x .25	= 970
Glass 98 sq. ft. x 17° x 1.13	= 135		People 2 x 215	= 430	Glass 98 x 72 x 1.13	= 7950
Max. Transmission Gain	= 1880			= 10300		= 8920
	2015	Internal Gain				

Figure 2

yields a net heat gain to the space of 6600 BTU/HR. Now in order to simplify the portrayal of this picture, it has been necessary to assume that the solar heat gain on this East exposure is constant throughout the entire temperature range. Actually this isn't true, for at the time when you would be experiencing 10 degree weather these values would be somewhat reduced. As for example, in February the base solar heat gain factor is 122 at 9:00 a.m. At the same time, however, it should be considered that if we were analyzing a South exposure the September and March heat gain figure would rise from a value of 140 to a value of 165 in December. The vertical scale, which is located in the center of this chart, represents outside temperature and is graduated from zero degrees to 95°. The horizontal scale is laid out for heat loss on the right and heat gain on the left.

Line A represents the heating or cooling load for room A. This includes transmission, solar heat gain and people load, but does not include the lighting load on the assumption that lights would not be used during maximum sun intensity. Line B represents the heating or cooling load for Room B, and includes transmission load, lighting load and people load. Line C represents the Room C, which is unoccupied, and is therefore subject to transmission load only. All of these lines are straight up to the outside temperature of 72°, but at that point they tilt upward because of the elevation of room temperature to a maximum of 78° with 95° outside temperature.

Horizontal lines drawn across this chart at various outdoor temperatures tell the story as to whether heating or cooling is required in the individual spaces. At 60° outdoor temperature Room C requires a slight amount of heating, whereas, the other two rooms require cooling. At 40° outdoor temperature Room B is in equilibrium and requires neither heating or cooling, but Room C requires considerable heating, while Room A requires considerable cooling. At 20° outdoor temperature, Room A is still slightly on the cooling side, whereas, both rooms B and C require considerable heating.

These load changes can take place very quickly and can be produced by either turning lights on and off, or the sun passing behind a cloud, or by shadows cast by an adjoining building. Some of the load changes can be absorbed by the structure, and this tends to minimize the total number of degree variation of room temperatures. In this example, the theoretical temperature drop when solar heat gain is eliminated would be more than 10 degrees if the supply air quantity and temperature remained unchanged, and if the structure yielded no heat. Actually, as soon as the room air temperature drops a new load develops by release of heat from the walls, floors and furnishings. The actual variation would be

more like 3 to 5 degrees depending on the length of duration of the load change and the heat storage characteristics of the space.

It is apparent that all year around air conditioning should provide considerable flexibility in order to handle these quickly changing loads. This requirement can be best met by the provision of two sources of thermal capacity in each room, one at a high level and the other at a low level. At the same time it should be recognized that the load changes discussed are a sensible heat only, and the latent heat load has remained substantially constant in relation to the total load. Therefore, any means of reducing sensible heat capacity should avoid reducing latent heat capacity. This is particularly important on days of low outside dry bulb temperature with high humidity. Reduction of dehumidifying capacity would raise the inside humidity and produce that feeling of clammy coldness.

There are several accepted and satisfactory methods of handling these load variations and retaining humidity control.

Probably the oldest and most popular has been the reheat method, which utilizes a hot water or steam reheating coil in the supply to each room. With this method, humidified or dehumidified air is furnished to the rooms at a temperature lower than the desired room temperature, and the final control is given by reheating as is necessary. The heater coil may be located in the individual supply duct to each room, or may be placed in the indirect air stream of a Weathermaster unit. For economy of operation a combination of volume reduction and reheating in sequence is usually employed. Limit stops on the volume dampers assure that the supply air quantity is never reduced below that required for adequate air circulation and dehumidifying capacity.

Fan type unit cooler systems can also be arranged to provide complete control, by the use of a dual piping circuit. This arrangement permits use of a separate dehumidifying coil in the outside air intake. Thus one circuit carries cold water for dehumidification as long as required by outside conditions. The second circuit connected to a sensible heat coil in the unit, carries cold or warm water as required by the average load on the zone.

Fan cooler systems are also frequently installed with a duct system for delivery of dehumidified ventilation air to each space. This may be connected to the intake of the unit, or discharged separately into the room through a wall or ceiling type outlet. The dehumidified ventilation air may be heated as necessary during cool days, and during this period the water supplied to the unit is kept cool to provide room control. On cold days, when the maximum heating requirements are approached, the operation is switched to cool air and warm water. This method therefore, provides complete flexibility all year around.

The latter method is the one used in the Carrier Conduit System. The primary air temperature is held at a constant value of 56° down to approximately 80° outside air temperature, and then is gradually increased in temperature according to a schedule which has been predetermined according to the transmission loss factors of the building. In this particular chart, the air temperature is carried up to 90° until the outside air temperature drops to 50° . During this period the water temperature is held at approximately 50° . As the outside temperature drops, we gradually reach a point where the primary air has insufficient heating capacity to take care of transmission losses and at this point the system is changed over. The water temperature is elevated to that temperature necessary to carry the total transmission loss, and the air temperature is reduced to a level of 50° . Thus at all times there are sources of both heating and cooling available in the room, affording complete flexibility in response to load variations, as well as individual preferences.

**Mr. Joseph E. Leininger gave the following discussion of
Mr. Mehl's paper.**

The speaker is to be congratulated for presenting an understandable paper on what is admittedly a very complex subject.

We note with interest that the speaker has stated that considerable pressure has been subjected on the air conditioning engineer to reduce space requirements for ducts and piping even beyond the irreducible minimum.

In this connection I would like to point out that there is still another type of system known as the "double duct system" which has been used successfully for handling the varying loads in multi-room buildings. This type of system employs mixing dampers, usually automatically controlled, for varying the quality, but not the quantity, of a mixture of warm air and cool dehumidified air for each room in the building. In fact, this makes each room of the building its own zone. The warm air and the cool dehumidified air are obtained by the use of a heating and cooling coil respectively, each serving its own duct system usually supplied by a single fan on each floor of the building. The coils are supplied by hot and cold water respectively with the temperature of the supply water being varied inversely with variations in outside temperature. That is, the warm water to the heating coil is raised as the outside temperature falls and the cold water to the chilled water coil is lowered as the outside temperature increases. With this system it is usually economical to treat the ventilation air supply independently during the cooling season and often in mild climates no treatment of the ventilation air supply whatsoever is made during the heating season.

This system is admittedly an expensive system to install but so are the systems described by the speaker. It does have the advantage of removing the liquid phase from the individual rooms in the building which usually results in a considerable savings in piping and insulation of same. Conversely, the duct work is expensive and does require more space than the so called "high pressure primary air system." However, it is conceivable that the high velocity duct system can be utilized for the double duct system with a resulting savings in space requirements and installation costs.

One problem which remains to be solved is the question of converting the high pressure, high velocity air to low pressure room supply air without undue noise. This has been accomplished successfully in several installations made during recent years.

Another advantage of this type of system is that it solves the problem of condensate removal through relatively small piping and does permit the introduction of larger air quantities to the conditioned spaces, particularly where heavy smoke or other odor producing sources are likely to be present, and allows a more rapid rate of air change in these spaces.

It is also of interest to comment on the question of irreducible minimum insofar as space requirements of piping and duct work for buildings are concerned. I believe that the air conditioning engineer should have more latitude in the way of space available for installing equipment if overall costs of the system installed are to be held to reasonable limits, or within the budget estimates which are often prepared by others. By installation costs I mean the cost of the air conditioning system plus the cost of the building alterations or building space required for accommodating the air conditioning system.

Each individual installation is worthy of serious study by the designing engineer in the light of all of the factors which apply to the particular case in hand. I think that any one who is familiar with the problems encountered in air conditioning multi-room buildings will agree, in all fairness, that no one system is the perfect solution or even the best solution in all cases. Often one system will offer advantages in one case but an entirely different type of system may be required in another case if all of the factors which are involved are taken under due consideration.

In conclusion I would like to state that I think the Louisiana Engineering Society and the Chairman of the Technical Papers Committee, as well as his assistants, are to be congratulated on obtaining the interesting paper presented by Mr. Mehl.

JOSEPH E. LEININGER.

WEATHER'S PART IN ENGINEERING

Nash C. Roberts, Jr.*

At first thought there might seem little connection between a consulting meteorology service and engineering. However, contractors, roofers, oil well companies and many others have operations vitally dependent upon weather forecasts. Even department stores are aided by forecasts in connection with planned sales.

One particularly graphic illustration of weather forecasting and construction work is that of the large roofing contractors. For extensive jobs of removing and replacing a roof, they may have to wait for several days until they get the "go ahead" signal from the meteorologist. Then after the prediction is made, the worry about whether some unexpected change may occur, takes about five years off of your life.

I am often asked how I can compete with the U.S. Weather Bureau, when their predictions are free. The answer is that our organization gives personal service on each job, checks the progress of the job against the forecasts, and is able to really act as a consultant.

The oil well drilling companies frequently need accurate forecasts about weather and tidal conditions, when barges with rigs are to be moved. The tides affect the depth of channels, wind and waves may endanger the equipment because of possible capsizing. On a top heavy drill rig, the expected wind velocity can be of utmost importance.

The decision to call workers onto a job is also influenced by the forecasts. It works two ways: The first decision as to whether or not to call the workers, secondly, if rain does start, the contractor will want to know about the duration. It may be cheaper to let the men go, or due to certain commitments, it might be to his advantage to keep them around for a few hours, then return to work.

Another phase of the work is climatology. Research as to rain fall may be extremely important to many industries. Each location might be said to have its own "private" climate, one square mile may actually differ from another. This is called micro-meteorology. Thus, through research, it may be possible to advise as to the best location of the plant.

Prediction of prevailing winds is another phase of the work dealing with plant operation. A local company having extensive operations, at times generate smoke in their process. The generation

* Presented at regular meeting of the L.E.S. on May 12, 1953.

of the smoke is unavoidable, but the public relations as a result of the smoke may be strained. Here the meteorologist can select days for the process when the wind will carry the smoke over uninhabited areas. The most critical day is of course Monday. Winds may also affect the formation of smog, which may or may not become a medical problem. A plant producing fly ash or smoke, about which particles of moisture may condense, should not locate where warm, moist winds will blow over the plant site. A knowledge of the prevailing winds will be of help here.

The placing of equipment subject to corrosion is another item to be planned. If the salt winds from the gulf are encountered, sensitive equipment should be shielded as much as possible from these elements. Often a little planning in connection with this, will save many dollars in equipment damage.

Prevailing winds will also dictate the location of stacks. Disregard for this climatical condition has sometimes caused considerable trouble by smoke being "recirculated" in the buildings.

Maximum wind velocities and gust velocities are important considerations in the design of structures. These conditions are of concern before the structure is designed and built, and after completion if damage occurs, the meteorologist may be of help.

Some industries are particularly interested in humidity conditions. A local match concern requires a careful analysis of the weather conditions in relation to their product.

I have long felt that the air conditioned building regulation should be closely tied in with outside conditions. As the outside temperature rises, the interior temperature should also rise. This reduces the "shock" in leaving an air conditioned area.

Industries in which waste ponds are used will be affected by the dry bulb and wet bulb conditions of the locality. A history of the weather over years gone by will not only aid in design of the equipment, but will aid in predicting operating costs and the general economy of the system.

In a projected location of a plant having disposable liquid waste, the meteorologist can help with rainfall data. This is particularly important with stream flow and stream pollution. It can be predicted whether "holding reservoirs" may be necessary in times of low stream flow. Most of us think of rainfall reports as of the past few years, relatively. Yet the weather can be studied for almost 1,000 years ago by means of the rings on the trees. These tell the story of the dry years and the wet years.

In answering the question of long range forecasting, I want to call your attention to some of its uses. Cotton growers, manufac-

turers of fans and air conditioning equipment, garment manufacturers are just a few who are interested in this type of forecast. They plan their work and manufacturing based on this data. The prediction of a warm winter, means fewer overcoats to manufacture, for instance. With proper reference cycles, a long range forecast can be a guide to the answer.

In connection with cloud seeding to form rain, let me say that cloud conditions must be right. There should be a vertical rise of cloud bank, and this should extend at least 3,000 feet into the freezing zone. There has to be a mixture of frozen particles to make this method effective. Care also has to be exercised in the area seeded; some plantations may want the rain, others may not. Litigation has resulted in some cases.

The prediction of weather in this area is a challenge. Since much of the weather comes in from the Gulf, where there are no weather stations, our weather changes may be just about two hours away. It is a twenty-four hour job, if there ever was one!

OBITUARY OF ERNEST COULOHERAS

The engineering profession and his many friends suffered a great loss with the death of Ernest Couloheras, Commander, U. S. N., in Naples, Italy, on January 21, 1953.

He was born on September 27, 1906, in the City of Meligala, Greece, the son of George Couloheras and Georgia Pelias.

His early education was obtained in his native country, and in the year 1919, he came to America and made his home in New Orleans. He attended public school in New Orleans, and entered Tulane University, College of Engineering, in 1926. He was graduated with the degree of Bachelor of Engineering in Civil Engineering in 1930.

After graduation he entered the employ of the Board of Levee Commissioners at New Orleans and for 20 years prior to his recall to active duty in 1952, Commander Couloheras was a civil engineer with this Board, last holding the position of assistant chief engineer.

Prior to his graduation from Tulane, he enlisted in the Louisiana National Guard, and from May 1929 to May 1933, served with the General Staff Section, Division Headquarters Detachment, 31st Division.

The first Navy assignment of Commander Couloheras was with the office of the Inspector of Naval Material in Chicago, Ill., where he served for 11 months. Completing duty in Chicago, he was transferred to the U. S. Naval Aviation Facilities, Traverse City, Michigan, where he served as officer in charge of construction for 16 months.

He attended Military Government School at Columbia University and later served as the public works officer for the Military Government Unit at Guam. He participated in the Guam Invasion and served for 18 months at the island. He was released from duty in June, 1946, as Lieutenant Commander.

Commander Couloheras became executive officer of Organized Construction Battalion Company 8-1 in New Orleans on February 6, 1948, when he transferred to the organized reserve. This year he was assigned to the Naval Construction Battalion Center at Port Hueneme, California, for two weeks training duty, and in the following year had training duty with the Navy Secretary of the Research and Development Board, National Military Establishment, Washington, D. C., for a course of geophysics and geography. In March 1950, he became commanding officer of Organized Construction Battalion Company 8-10 in New Orleans. In November 1950, he completed a two weeks training in disaster relief.

He was an active member of the Greek Orthodox Church, and served as President of the Board which sponsored the foundation and erection of his Church, and he was a member of the American Society of Civil Engineers and of the Louisiana Engineering Society.

He was married in May 1946 to Miss Magdalene Anthony of San Antonio, Texas. He is survived by his wife and two daughters, Frances and Georgia.

Ernest was a man who was extremely zealous and conscientious in all of his undertakings. He was loved and respected by all those who knew him well.

It is therefore fitting that we honor the memory of Ernest Couloheras by adopting the following resolution:

BE IT RESOLVED, that the Louisiana Engineering Society adopt resolutions embodying the facts as expressed above.

BE IT FURTHER RESOLVED, that this resolution be included in the minutes and published in its proceedings and that copies be sent to his family.

ERNEST L. MIRE
STANLEY M. LECOURT

OBITUARY OF ROY C. SINGLETARY

God called Roy Singletary to his eternal reward on January 7, 1953 at his residence in Lafayette at the age of 54 years.

He completed his education at Louisiana State University in Baton Rouge and served his country in the armed forces during World War II.

In May 1926 he started his career with the State of Louisiana Department of Highways where he attained the responsibility of Senior Project Engineer which position he held at the time of his death — a record of over 25 years service to the State.

On December 28, 1926 he married Miss Louise T. Lacroix and this happy union was blessed with two children — a son, Dr. C. Teal Singletary of Bastrop, Louisiana and a daughter, Mrs. Martha S. Boyer of Odessa, Texas. He was a great lover of children.

He was an active member of the Louisiana Engineering Society having been a charter member of the Lafayette Section.

WHEREAS, the Father of us all, in His wisdom, has claimed Mr. Singletary for His own, we, as a Society, and as individuals shall greatly miss him.

BE IT THEREFORE RESOLVED, that we extend to his loved ones our heartfelt sympathy and request our secretary to convey a copy of this resolution to his immediate family.

ENGINEERING BRIEFS

IBM Magnetic Drum Calculator. International Business Machines Corp., has announced the introduction of a new commercial electronic decimal calculator designed to meet the vast accounting and computing requirements in areas between those now served by its "giant brains" and the widely-used smaller machines such as the 604 Electronic Calculating Punch and the Card-programmed Calculator.

Called the IBM Magnetic Drum Calculator, the new machine combines one of the advanced memory devices and the stored program concept of IBM's big "701," recently announced, with new high speed reading capacity in the conventional punched card equipment to achieve a powerful data processing machine for commercial and engineering requirements.

In addition to its usefulness as an accounting and computing tool, the Magnetic Drum Calculator will be a vital factor in familiarizing business and industry with the stored program principles fundamental to electronic data processing equipment. Though its capacity is large, it is designed for exceptional ease of problem preparation and operation. A significant feature of this machine is its ability to check the accuracy of its answers.

Typical application of the Magnetic Drum Calculator is the simultaneous computation of insurance premiums and calculation of required reserves.

For the automobile industry, the calculator can "remember" several weeks' or months' production schedule of finished products, and at the same time calculate at high speed the number of parts required for their production. It can take into account such factors as "lead time" and indicate the dates on which orders must be placed for each part to be available for scheduled assembly.

Because of such advanced techniques as its large stored program and its extensive memory capacity, the drum calculator can incorporate in one machine operations in punched card accounting which once required several machines. A numeric decimal machine, it has put to 20,000 memory positions and can accept as many as 2,000 individual operating instructions to facilitate commercial and scientific computations. It consists of three units: a magnetic drum unit with electronic calculating components, an input and output unit, and a converter. It occupies approximately the same area as two ordinary office desks and a filing cabinet.

All of the calculator's arithmetic operations are controlled through a program which may be entered either automatically from punched cards or manually from the operator's console and

stored in the form of magnetized spots on the surface of a drum only 4" in diameter and 12" long, spinning at 13,000 revolutions a minute. The calculator's arithmetic unit operates at electronic speeds. It can: accumulate 10 digit numbers to form a 20 digit total at the rate of 200 a second; multiply 10 digit numbers by 10 digit numbers to develop a 20 digit product at the rate of 100 a second, and divide a 19 digit number by a 10 digit divisor to develop a 10 digit quotient and a 10 digit remainder at the rate of 80 a second. It has an input rate of 200 punched cards a minute and a separate output of 100 cards a minute.

In addition to its large numerical capacity, the calculator also features a "Table Look-up" operation which facilitates the automatic searching of rate tables such as occur in the utilities, life and casualty insurance, transportation and other commercial fields.

The operation of these features as they might be used in a standard commercial application of the magnetic drum calculator is illustrated by following the course of events from the time a gas and electric meter has been read to the time the bill is prepared. While the utility company representative is peering with his flashlight into those out-of-the-way places where meters often are installed, the magnetic drum calculator, back in the home office, has stored on its drum the complete rate structure of the utility and is ready to consolidate a minimum of five operations into one processing. When all the individual meter cards are fed into the machine, the drum calculator, by means of its Table Look-up feature, selects the rate applicable for each class of service, makes all the necessary calculations for the bill amount, and punches the result into another card along with the indicative information necessary for bill preparation. In this application, internally contained self-checking features virtually eliminate the necessity for separate processing of the cards for checking purposes. The entire operation materially reduces the time involved in getting out the utility company's bills.

In addition to performing all the computations necessary for billing purposes, the calculator's remaining drum capacity also can be used for the distribution of revenue or rate statistics. This cumulative information may be kept on the drum as long as desired, regardless of the disposal of the data used in the individual meter billing operation.

By means of the console, the operator has control over all stages of the calculations and may manually insert instructions or data into any desired storage location, examine the contents of these locations, stop the calculation at any required point and begin calculation with any desired instruction located in the memory unit.

Industrialización. Industrialization of Latin America has proceeded rapidly ever since just before World War II. According to a recent publication of the Chase National Bank, Latin America's manufacturing production index is now 175 on a scale which takes 100 as the pre-war status. These figures compare with 192 for the United States, 190 for Canada, and 136 for Europe. The indices of manufacturing production for some individual Latin-American countries, however, exceed those for the United States and Canada by a substantial margin—250 for Brazil, Colombia, and the Dominican Republic, for example, and almost 200 for Mexico, Argentina, and Chile.

The Chase National Bank lists a number of factors as essential for this industrialization to continue on a sound basis. One is the need "to absorb and develop modern technology and advanced management methods." This is the basis for another suggestion—that "manufacturing must become efficient enough to compete without undue protection." There appears to be little likelihood that Latin-American governments will alter the tariff barriers which protect local industry in the foreseeable future. This is important to U. S. companies who already have, or are considering, plants in these countries, since industrial operations backed with U. S. capital are protected in the same manner as plants which are purely national.

The facts on Latin-American manufacturing lead to the conclusion that, despite this remarkable progress, Latin America still offers great opportunities for further expansion.

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

* * * *

Today's Papyrus. Continuing research has kept the pulp and paper industry flourishing, and will contribute substantially to its future growth. Despite the advent of plastics and other new materials, the pulp and paper industry ranks sixth in value of goods produced, with an annual output worth \$6 billion. Annual U. S. consumption of paper and paperboard is now about 31 million tons, 14 times as much as in 1900. Some experts believe that it may reach 42 million tons by 1960. While sales of some paper products are closely related to population growth and business conditions, new developments from research promise a steady increase in the per-capita consumption of many others.

Packaging now accounts for about 45 per cent of the paper and paperboard used, with writing papers, including newsprint, taking some 30 percent; five million tons of newsprint are imported annually. About 700,000 tons of purified wood pulp fibers are consumed for rayon and cellophane, and wood fibres are also used for molding sewer pipe, conduits, etc., as fillers for plastics, and in the

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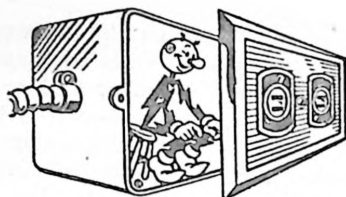
preparation of photographic film and explosives used as propellants. Chemical by-products of pulping operations, based on lignin, a chemical constituent of wood, find a number of uses in leather tanning, for mud control in oil-well drilling operations, as strengtheners for ceramics, for the dispersion of pigments, carbon black, and other insoluble materials, in compounds for reducing scale formation in boilers, and in the formulation of other industrial chemicals. Vanillin for food flavoring is one of the better-known by-products.

Paper products compete with many other materials, but for some purposes nothing is as satisfactory or as cheap as paper. No other material, for example, offers the advantages of paper for printing. In fact, printing papers, including newsprint, have probably reached maturity, because of increased use of radio and television for communication of ideas and advancing, and markets for printing papers may grow more in line with population increase. New methods of treating paper with resins or plastics, however, have greatly increased the use of "utility papers" — wrappings, toweling, tissue, and the like. Here, price is a distinct advantage, since other materials with suitable properties are considerably more expensive. Waxed paper, for example, costs about 1.5 cents for a thousand square inches; other representative prices are: glassine, 2.1 cents; cellophane, 3.3 cents; polyethylene film, 3.8 cents, and Pliofilm, 4.7 cents. The trend to prepackaging, especially of foods, offers great promise for further growth of this portion of the industry. Multiwall paper bags are gaining ground for packaging cement, fertilizers, bulk chemicals, animal feeds, and similar products.

Paperboard and building board are in the fastest growing segment of the industry, and great progress has been made in developing new uses. The growth of frozen foods is an important factor in greater paperboard consumption. Paper milk containers also have been well received; over seven billion were produced in 1951. Construction panels of hardboard separated by corrugated paper also appear promising.

Resources Adequate

Continued growth in paper and paperboard will mean larger supplies of waste paper, which are an important contribution to the raw-materials situation, although waste is not directly competitive with virgin wood pulp for many applications. Pulp-producing and waste-collection facilities on the North American continent are sufficient to supply all projected production capacity. One great advantage is that wood is a renewable resource, and proper management of forest reserves assures a steady supply. The amounts of timber grown and wood removed are approximately balanced



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NEW ORLEANS

now, and growth in properly cut forests is at a higher rate than in virgin forests. When woodlots are properly maintained, losses from insects and fire are greatly reduced; fire loss in some areas may be as low as one quarter of one per cent.

Product lines of pulp and paper companies are now being arranged to take advantage of the differing rates of growth of the various wood species available. Rotation may be in a cycle of anywhere from 25 years for Southern softwoods to 100 years for the forests on the West Coast. New pulping processes for woods previously considered low-grade have opened new sources of raw materials without necessitating the acquisition of greater tracts of woodland. Fibers from hardwood are shorter than those from typical soft pulpwoods, and are useful in plastics manufacture and in obtaining a hard paper finish. Considerable emphasis is now being placed on lignin utilization, since the lignin content of some hardwood logs ranges from about 20 to as much as 40 per cent. By use of recently developed methods, it is now possible to make pulp containing most of the cellulose components of the wood and a varying quantity of lignin. The start which the industry has made toward utilization of the present "waste" fraction of wood should lead to interesting developments, with particular emphasis on increased pulp yield.

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

* * * *

Science Foundation Appropriations Cut. The appropriation for the support of basic research through the National Science Foundation will be reduced to \$5,724,400 from the budget request of \$12,250,000 for the fiscal year ending June 30, 1954, according to the action of the House of Representatives. The heaviest cut was in the item for research support, reduced from \$8,434,000 to \$2,007,400, but the request for \$1,966,000 for training of scientific manpower was approved in full. This substantial reduction evoked expressions of misgiving from a number of influential members of the House. It was pointed out, however, that it is the policy of the administration to gradually transfer to the Foundation a major part of the governmental basic research program now administered by other agencies in particular fields. Under the transfer provisions of the Science Foundation act, other agencies may transfer funds available for research. The total basic research program for all agencies for the current fiscal year is estimated to be \$140,000,000.

The administration has also given its blessing to the legislation to remove the present appropriation limitation of \$15,000,000 per year for the Science Foundation. The House Committee on Interstate and Foreign Commerce has reported a bill to accomplish this purpose and this action, if approved, will pave the way for budget-

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ing less basic research money for other government agencies and more for the Science Foundation in future years. (H.R. 4689) Budget Director Joseph M. Dodge has stated the administration policy in a letter to Senator Smith of New Jersey: "The removal of the limitation is not expected to result in an increase in total Government expenditures for the support of research . . . When this study (by NSF) is completed, consideration will again be given to the proper level of Federal support of basic research. In the meantime, it will be desirable and economical to continue the gradual process of centralizing in the National Science Foundation, the general purpose basic research support program of the Federal Government."—*From Legislative Bulletin.*

* * * *

Method Developed for Using Inedible Fats and Vegetable Oils in Plastics. Specially treated inedible fats and vegetable oils are now being used as plasticizing agents in making vinyl plastic products as a result of a process developed at the U. S. Department of Agriculture Eastern Regional Laboratory in Philadelphia, Pa.

The primary purpose of a plasticizer is to make otherwise rigid and brittle material soft and flexible. Plasticizers from fats and oils do this, and in addition are especially valuable for chlorine-containing plastics, shielding them against discoloration and weakening caused by the hydrochloric acid formed when plastics are exposed to heat or sunlight. Unlike other modifiers, such as lead and cadmium compounds, the new plasticizers do not make plastics opaque or hazy.

The USDA method is relatively simple, according to Dr. G. E. Hilbert, Bureau chief. The acid portion of the fat is treated with hydrogen peroxide oil results. Such a process is cheap and practical and may be used with a wide variety of animal and vegetable fats and oils.

Further information is contained in Bulletin ACI-346, "A Survey on Research Possibilities for Animal Fats". Copies may be obtained from the Bureau of Agricultural and Industrial Chemistry, Washington 25, D. C., or from the Eastern Regional Research Laboratory, Philadelphia 18, Pa.—*From Aminco Laboratory News.*

* * * *

Cotton Fabrics Flameproofed by New Process. The U.S. Department of Agriculture announced recently that it has developed a process for improved flameproofed cotton fabrics, using a combination of chemicals including THPC, or tetrakis (hydroxymethyl) phosphonium chloride.

The new process, using standard textile equipment by well-known commercial methods, was developed at the Department's

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laboratory at New Orleans by Wilson A. Reeves and John D. Guthrie, who claim that fabrics treated by the THPC process retain flameproofness after more than 15 launderings. Two additional advantages of the new fabrics are: (1) good wrinkle resistance; (2) absence of afterglow as charred cloth does not continue to smolder after a source of flame has been removed.

Information on flameproofing investigations and small samples of fabric treated by the THPC process may be obtained from Dr. C. H. Fisher, Director, Southern Regional Research Laboratory, New Orleans, La.—*From Aminco Laboratory News.*

* * * *

Skin Color Blemishes Corrected by Drugs. Two drugs — the monobenzylether of hydroquinone, and a new one called psoralens — are being used to control skin color in humans and to correct blemishes such as over-pigmented spots or the milky-colored spots that occur in the disease known as vitiligo.

The use of these drugs to control skin color was announced recently by the American Cancer Society, sponsor of the work of Drs. A. B. Lerner and Thomas B. Fitzpatrick of the University of Oregon Medical School, Portland, Ore.

The object of the research is to learn the processes which produce albinism, disfiguring birthmarks, and colors associated with many diseases, and the deadly pigmented cancer called melanoma.

Three separate types of pigmentation studies are involved: (1) changing the pigmentation of a patient's skin — no hormones are involved; (2) changing the color of frog skins with hormone preparations; (3) incubating skin from humans with various chemicals in order to study the action of the cells in the pigmentation process.

The scientists can color and decolor isolated frog skin at will by what appears to be duplication of the body's actual chemistry. Some of the tests on living animals confirm the chemical observations on isolated skin and tissue extracts. The scientists have traced several of the chemical steps in the body's formation of melanin — the natural compound which gives color to the skin, hair, and eyes — and all they are attempting to produce chemicals which interfere with its production.—*From Aminco Laboratory News.*

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EXHIBIT "A"

LOUISIANA ENGINEERING SOCIETY

BALANCE SHEET, DECEMBER 31, 1952

(Cash Receipts and Disbursements Basis)

ASSETS

CASH:

Checking account—Whitney National Bank of New Orleans	\$ 3,770.27
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UNITED STATES SAVINGS BONDS, SERIES F

(Maturity value—\$6,000.00)—redemption value	\$ 5,047.00
--	-------------

INVESTMENTS — HOMESTEADS: (at cost)

Columbia Homestead Association	\$ 372.41
Commonwealth Homestead Association	306.52
Greater New Orleans Homestead Association	1,806.65
Security Building and Loan Association	500.00
Sixth District Building and Loan Association	500.00
Union Savings and Loan Association	500.00

Total investments — homesteads	\$ 3,985.58
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PROPERTY — Furniture, Fixtures, Equipment
and Books — nominal value

.....	\$ 1.00
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TOTAL ASSETS	\$12,803.85
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LIABILITIES

SURPLUS (Per Exhibit B)	\$12,803.85
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EXHIBIT "B"

LOUISIANA ENGINEERING SOCIETY

STATEMENT OF INCOME AND SURPLUS (ON CASH RECEIPTS
AND DISBURSEMENTS BASIS)

FOR THE YEAR ENDED DECEMBER 31, 1952

INCOME:

Dues collected (less rebate to Sections, \$1,492.25)	\$ 6,762.00
Advertising revenue (less rebates to Sections \$63.00)	594.95
Income from investments and savings accounts	244.31
Miscellaneous—net profit sale of certificates, proceedings, etc.	22.60

Total Income	\$ 7,623.86
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EXPENSES:

Salary - secretary - treasurer	\$ 2,400.00
Cost of publishing proceedings	2,101.74
Cost of annual meeting (excess of receipts (over) under disbursements)	(60.25)
Expenses paid in advance— succeeding year's annual meeting	204.28
Cost of annual outing (excess of receipt (over) under disbursements)	155.88
Refreshments at meeting (less pro rata receipts from joint meetings held)	432.37
Printing, stationery, and postage	1,203.15
Present to retiring president	61.50
Floral offerings	26.15
Library expense — porter	48.00
Social security tax	39.75
Auditing	140.00
Scholarship award	75.00
General expenses	204.18
Total Expenses	<u>\$ 7,031.75</u>

NET INCOME FROM OPERATIONS	\$ 592.11
DEDUCT—SURPLUS CHARGE—(Capital expenditure):	
Purchase of equipment	(44.92)
NET INCOME FOR THE YEAR	<u>\$ 547.19</u>
SURPLUS AT BEGINNING OF YEAR	12,256.66
SURPLUS AT END OF YEAR	<u>\$12,803.85</u>

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MINUTES OF THE MEETINGS AND BUSINESS OF THE SOCIETY

Minutes of Meeting of the Louisiana Engineering Society held on April 13, 1953

The meeting was called to order by First Vice-President Macdonald in the Claiborne Room, St. Charles Hotel, with approximately 50 persons in attendance. Acting President Macdonald welcomed members and guests, explained the absence of President Abraham and expressed his regret.

Mr. John Vogt moved that the reading of minutes of the preceding meeting be dispensed with, seconded by Mr. B. P. Babin and carried.

The secretary read an obituary of the late Callender F. Hadden, following which a moment of silence was observed in memory of the deceased.

Mr. M. G. Zervigon then introduced the speakers of the evening, Mr. James A. Cronvich, Professor of Electrical Engineering at Tulane University, who gave a brief but enlightening explanation of "Engineering in Medical Research". This was followed by the principal lecture of the evening, presented by Mr. Hal C. Becker, Electronic Engineer of the Department of Psychiatry and Neurology, Tulane University Medical School, on "Experiments in Electrophysiology".

The lecture was followed by the usual question period, which involved prolonged and interesting discussion. The meeting finally was closed by Mr. Macdonald because of the lateness of the hour, with a hearty round of applause for the speakers.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Board of Direction held on Monday, April 20, 1953

The meeting was called to order by President Abraham, with Messrs. Hogg, Macdonald, McNiven, Nelson, Seago and Fernandez present. Mr. Nelson moved that minutes of the board meeting of March 9 be accepted as read, seconded by Mr. McNiven and carried. Mr. McNiven moved that minutes of the special board meeting of March 23 be accepted as read, seconded by Mr. Seago and carried.

President Abraham announced that the following appointments had been made:

(1) Mr. C. Glenn Cappel, Chairman of the special committee to study salaried employee wages for a recommendation to the State Civil Service Commission.

(2) Mr. Lionel J. Cucullu, to explore the possibility of industry employing faculty members on a recurrent basis during the summer months.

(3) Mr. Felix L. Alcus, Chairman of a committee to investigate the suitability of an educational program of refresher courses for L.E.S. members.

(4) Mr. Alvin M. Fromherz, Representative of L.E.S. on the city-wide committee on proposed changes to the city building code.

(5) Messrs. John L. Porter, Allan T. Dusenbury and Charles S. Williamson, Jr., representatives of L.E.S. on the Citizens' Planning Committee.

The secretary reported that all applicants listed in the March ballot had been elected to their respective grades with the exception of one which has been withheld for further information.

The secretary reported that the Section Survey was completed and that very few members had expressed a desire to change their present section affiliations.

The quarterly financial report was presented to the board and accepted.

A communication from Mr. David Moodie, accepting chairmanship of the 1954 annual meeting, was read.

A letter from the National Society of Professional Engineers also was read, in which the L.E.S. was congratulated for its success in promoting Engineers' Week.

Mr. Seago moved that Mr. Aubin J. Coleman and Mr. William T. Turner, Jr. be reinstated to junior membership in the Society, seconded by Mr. Nelson and carried. Mr. McNiven moved that the resignation of James L. Self be accepted with regret, seconded by Mr. Macdonald and carried.

Correspondence with Bastian Bros. Company, Manufacturing Jewelers, regarding emblem pins for the Society was read. Mr. Macdonald moved that a survey be made to determine the number of members interested in purchasing an emblem. Motion seconded by Mr. Nelson and carried.

Mr. McNiven moved that, in accordance with the constitution, the election of Mr. David O. Garred, Jr. be considered void because of his failure to acknowledge same. Motion seconded by Mr. Seago and carried.

Mr. Macdonald moved that the following delinquent members be dropped from the rolls in accordance with the constitution, seconded by Mr. Hogg and carried:

Francis W. Alcock, O. J. Baker, S. Clarence Blaize, Donald T. Boumans, Charles R. Brackin, Warren J. Brignac, Martin Carbonell, Alvin J. Conner, George E. Core, Raymond S. Derrough, Donald R. Downs, Theo G. Edwards Jr., Peter M. Ferguson, Wilfred F. Herbert, Richard L. Johnson, Jack H.



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Upon the recommendation of the board, President Abraham appointed Mr. Arthur M. Hill, Editor of the Proceedings, to write a short article on the late Leon C. Weiss for publication.

Discussion followed concerning the annual outing, after which Mr. Macdonald moved that the Outing Committee be authorized to charge as much as \$5.00 per plate for dinner, \$3.00 for golf and \$1.00 for horse-shoe pitching. The motion was seconded by Mr. Nelson and carried.

Mr. Macdonald suggested a plan in which each member of the board would sponsor two or three standing committees and serve as a liaison between the committee and the board. The idea met with the approval of the board.

The secretary announced that an Instrumentation Conference would be held on May 1 and 2 in Ruston and that anyone able to attend was urged to do so.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Board of Direction held on May 11, 1953

The meeting was called to order by President Abraham in Room 422 St. Charles Hotel, with the following members present: Messrs. Kelly, Macdonald, McNiven, Nelson, Seago and Fernandez. Mr. Nelson moved that minutes of the preceding meeting be accepted as read, seconded by Mr. Macdonald and carried. The secretary then read minutes of a meeting of the Louisiana Council of Engineers held on April 13, 1953.

President Abraham reported on a meeting of standing committee chairmen which was held at the Engineers' Club on April 27.

Correspondence between the secretary and Mr. Paul H. Robbins, Executive Director, National Society of Professional Engineers, concerning a salary survey of engineers, was read. Also read was a letter from Dean Ben T. Bogard, Chairman, Legislative Committee, suggesting proposed amendments to the present engineering registration law.

In accordance with a suggestion made by Mr. Macdonald at the April meeting, and with the concurrence of the Board, President Abraham appointed board members to sponsor standing committees as follows:

Mr. Perrilliat, Employment and Publicity; Mr. Fernandez, Honors and Awards; Mr. McNiven, Professional, Civic and Industrial Affairs; Mr. Nelson, Technical Papers and Professional Studies; Mr. Kelly, Special Activities; Mr. Seago, Entertainment and Outing, Publications and Section Coordination; Mr. Macdonald, Membership, Legislative and Vocational Guidance.

Mr. Macdonald moved that all engineering graduates of Louisiana universities who may apply for membership be awarded a half-year's junior membership in the Society without payment of dues. The motion was seconded by Mr. Kelly and carried. Mr. Macdonald also agreed to notify the universities that such free memberships were available to their current graduates.

In accordance with the request of Mr. Bobby J. Hollingsworth, now living in Kansas, Mr. Seago moved that his resignation be accepted with regret, effective December 31, 1953. Motion second by Mr. Kelly and carried.

Mr. McNiven reported that he had been asked by civic leaders to extend an invitation to the National Society of Professional Engineers to hold its 1957 convention in New Orleans. Discussion followed, but no action was taken.

The secretary reported that he had accepted an invitation from the chairman of the Board of Public Works of Louisiana to attend their hearing on Tuesday, May 12, and that he would represent the Society on that occasion.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Society held on Monday, May 11, 1953 in the Jackson Room, St. Charles Hotel

The meeting was called to order by President Abraham with approximately 75 members and guests present. The president welcomed those in attendance. Mr. B. P. Babin moved that the reading of minutes of the preceding meeting be dispensed with, seconded by Mr. Hill and carried. The secretary then read minutes of the board meeting on April 20.

An obituary of the late Ernest Couloheras was read, following which Mr. J. E. Rebold moved that same be spread upon the minutes and a copy forwarded to the family of the deceased. Motion seconded by Mr. James M. Todd and carried. A moment of silence then was observed in memory of the deceased.

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Mr. John F. Vogt, Chairman, Technical Paper Committee, introduced the main speaker of the evening, Mr. Nash C. Roberts, Jr. Consulting Meteorologist, who gave a most interesting and instructive talk on "Consulting Meteorology and Its Relation to Construction Projects". A lively question period followed, which was interrupted at the height of discussion to permit the speaker to keep an appointment for a television broadcast.

The meeting closed with the usual social hour and refreshments.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Board of Direction held on Wednesday, June 8, 1953

The meeting was called to order by President Abraham with Messrs. Kelly, McNiven, Nelson, Seago, Wallace and Fernandez present. Messrs. David Moodie and C. Glenn Cappel also were present by invitation. Mr. Kelly moved that minutes of the preceding meeting be accepted as read, seconded by Mr. McNiven and carried.

Mr. Moodie, General Chairman of the 1954 Annual Meeting, outlined several proposed programs for the meeting, after which the board agreed that the Society's general meeting would be held on Thursday morning, two technical papers Thursday afternoon and the general interest meeting Thursday evening; two technical papers on Friday morning, plant visitation Friday afternoon, and the student conference on Saturday morning.

Discussion followed concerning a suitable place to hold the general interest program, since Dixon Hall has been too large for the attendance in past years. Among locations suggested, the most likely was the Engineers' Club, but no decision was made.

Another recommendation offered by Mr. Moodie was to dispense with the speakers' table at the banquet and thus provide a better arrangement of tables and more room.

Mr. Cappel, Chairman of the Special Activities Committee, submitted a schedule of recommended salary ranges for engineers under state civil service. This proposed schedule was accepted by the board, and Mr. Cappel was authorized to present it to the Department of Civil Service, State of Louisiana.

There followed a discussion of salaries for engineering teachers in state colleges, and Mr. Nelson suggested that the findings of the Special Activities Committee be offered to the State Board of Education, at the discretion of President Abraham, as a matter of interest and concern to engineers.

A letter from Mr. Fred D. Broussard, Vocational Guidance Committee representative at Baton Rouge, concerning vocational guidance in colored high schools, was read. Mr. McNiven moved that the Chairman of the Vocational Guidance Committee be authorized to advise the Baton Rouge Section to render such guidance of students of Capitol High School on a personal consultation basis.

Mr. Kelly moved that the secretary be instructed to write to Messrs. Clayton L. Nairne and Lionel J. Cucullu, congratulating them in the name of the Society upon their election as vice-presidents of their company.

It was announced that Mr. J. H. Collins, Sr., Chairman of the Committee on Honors and Awards, had mailed requests for nominees to receive the Society's awards. Board members were urged to send in their recommendations as soon as possible.

Mr. McNiven reported that he had received a letter signed by Governor Kennon, Mayor Morrison, and President Newman of the Chamber of Commerce, requesting that he invite the National Society of Professional Engineers to hold its 1957 convention in New Orleans, and asked whether the L.E.S. would be interested in sponsoring such an invitation. Correspondence with the executive director of N.S.P.E. revealed that the organization holds meetings only in locations where there is an affiliated society. Since the Louisiana Engineering Society is not affiliated with them, such an invitation apparently could not be accepted, and it was decided therefore not to extend one.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Board of Direction held on Monday, July 27, 1953

The meeting was called to order by President Abraham with Messrs. Macdonald, McNiven, Perrilliat, Seago, Wallace and Fernandez present. Messrs. Felix L. Alcus, Ben Bogard, C. Glenn Cappel and James M. Todd also were present by invitation. Mr. Macdonald moved that minutes of the preceding meeting be accepted as read, seconded by Mr. Perrilliat and carried.

A copy of the recommendations for changes in the present Engineering Registration Act, prepared by the Legislative Committee, was presented by the chairman, Mr. Bogard. Discussion followed, after which President Abraham appointed a committee consisting of Messrs. Seago, Perrilliat and Wallace to study and report on these proposed modifications to the law.

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Mr. Cappel, Chairman of the Special Activities Committee, reviewed his recommendations to the Department of State Civil Service with regard to salary ranges for engineers and engineering aides. Discussion followed on engineering faculty salaries and it was moved that Mr. Cappel be authorized to proceed to place before the governing bodies of engineering schools in the state the facts concerning average pay of professional engineers compared with a view to having the latter increased. Motion by Mr. Seago, seconded by Mr. McNiven and carried.

Mr. Alucus, Chairman of the Professional Study Committee, reported that he had contacted the various universities regarding refresher correspondence courses for members of L.E.S., and announced that the universities were willing to provide 12 different courses (L.P.I. supplying the majority) if the demand was sufficient to warrant them. Discussion followed as to the number of members who might be interested in taking these courses, and Mr. Macdonald moved that the membership be canvassed to determine the probable response to such a project. Motion seconded by Mr. Seago and carried.

The secretary reported that all applicants named in the June ballot had been elected to their respective grades. He also advised that the canvass regarding emblem buttons was completed and that the count was evenly divided between gold filled and 10-karat gold pins, whereupon Mr. Macdonald moved that the Society order 150 of each type. Motion seconded by Mr. Wallace and carried.

A letter from Mr. John St. Raymond, regretting his inability to accept the vice-chairmanship of the Registration Committee for the 1954 Annual Meeting because of his transfer from New Orleans, was read. With the board's approval, President Abraham appointed Mr. Warren K. Bankston to replace him.

Letters concerning vocational guidance and the 1957 convention of N.S.P.E. were read.

Mr. Seago moved that the resignation of Mr. Charles E. Doerler be accepted with regret, seconded by Mr. Perrilliat and carried.

The auditor's report for 1952 was presented and accepted by the board and, there being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

**Minutes of Meeting of the Alexandria Section, Louisiana Engineering Society,
May 21, 1953**

The meeting was called to order by the President at 8:00 o'clock p. m. at Herbie K's Restaurant.

The meeting began by reading the minutes of the April meeting which were approved.

President Hogge extended to the club an invitation to a stag meeting with the Baton Rouge section on June 30.

The group agreed to set aside the June meeting as "Ladies Nite", and have a barbecue. The date agreed upon was June 27.

There were seven members present.

Meeting adjourned.

NEWTON HIMEL, Secretary-Treasurer

**Minutes of Meeting of the Alexandria Section, Louisiana Engineering Society,
June 27, 1953**

The regular meeting for the month of June was held in Mansura at Central Louisiana Electric Company's camp by having a Bar-B-Que with the Ladies Auxiliary as guest of the club.

This being Ladies Night and nothing of importance to be discussed, the meeting was called to order and dispensed with such business as was necessary, and adjourned for the summer months, the meetings to be resumed the third Thursday in October.

NEWTON HIMEL, Secretary-Treasurer

Minutes of Meeting of the Lafayette Section, Louisiana Engineering Society

The May meeting was held at Poor Boy's Riverside Inn at 7:30 on May 19, 1953. This was the annual "ladies Night" and 50 persons were present. President Allen Bonnet opened the meeting by extending a welcome to the ladies and guests.

The minutes of the previous meeting along with a treasury report were then read and approved as read.

Mr. Felix Boudreaux was called upon to make a report of the work done on Vocational Guidance. Mr. Boudreaux reported on the work done, the main obstacles in getting the work done and the work still to be done along that line.

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SAVANNAH
Savannah, Ga.

O. HENRY
Greensboro, N. C.

Mr. F. A. Consterdine then read a memorial resolution in respect to the late Mr. Roy C. Singletary and requested the Secretary to send a copy to his immediate family.

Along the line of new business the President read an invitation to the members to be the guest of the Baton Rouge Sec. on June 20th. He then called for a report from the nomination Committee and the following were elected unanimously:

Felix Boudreaux, President; F. A. Consterdine, First Vice-President; J. E. Reed, Jr., Second Vice-President; Alfred Schoefler, Secretary-Treasurer.

Dean F. W. ZurBurg then introduced the guest speaker, Mr. Michael C. Abrahm, State L. E. S. President, who gave a most interesting talk on Professional Unity on Local, State and National level.

The meeting was then adjourned.

EMERY DOMINGUE, Secretary-Treasurer

Minutes of Meeting of the Monroe Section Louisiana Engineering Society

The Monroe Section of the Louisiana Engineering Society met at the Missouri Pacific Railroad Booster Club House in Monroe, La., June 2, 1953 at 7:00 p. m. The meeting was called to order by Monroe Section President Mr. J. T. Folk, Sr.

Before beginning the business meeting a barbecue supper was enjoyed. Immediately following the supper the business meeting was called to order and it was decided to dispense with the reading of the minutes from the previous meeting. All members were requested to introduce themselves, indicating the agency or company they were associated with, and at this time the guests were introduced. This resulted in a count of 38 members and four guests present.

After the introductions were completed reports were received from all committee chairman present, indicating most of the committees had been active since the previous meeting.

Following the committee reports a very interesting film was presented showing the mechanization of the pineapple industry in the islands of Hawaii.

After the film was shown there was a period of fellowship and visiting among the members and guests.

There was no definite announcement regarding the next meeting but it was tentatively agreed that we would endeavor to hold the next meeting at Sterlington, Louisiana. All arrangements are to be made by the Entertainment and Program Committee.

No further business was presented and the meeting was adjourned.

MILLARD P. SNYDER, Secretary-Treasurer

Minutes of Meeting of the Shreveport Section Louisiana Engineering Society held May 9, 1953

The meeting was held at the Bossier Parish Police Jury Club House on Lake Bistenean and was called to order by President Gillen at 5:00 p. m.

It consisted of a most enjoyable fish fry. Many of the members brought their wives and families with them.

No business was transacted.

A. P. ANDREWS, Secretary-Treasurer

Minutes of Meeting of the Shreveport Section Louisiana Engineering Society held September 1, 1953

The meeting was held in the Hostess Room of the Continental Baking Company, Inc., bakers of Holsum bread and Hostess cup cakes, and was called to order by President Gillen at 7:00 p. m.

Secretary Snyder read the minutes of the last two meetings which were approved as read.

Treasurer Snyder gave a report on the finances of the Society.

President Gillen appointed the following persons to comprise the Nominating Committee to nominate candidates for offices to be elected at the December, 1953, meeting:

Robin M. Hood, Chairman; Henry N. Brown, Winfield W. Alsup, Val A. Lyons, A. J. Shoup.

President Gillen appointed the following persons to comprise the Barbecue Committee to arrange for the annual barbecue and shrimp boil to be held at the Caddo Parish Police Jury camp at a time to be arranged later:

John L. Iles, Chairman; John H. Ellis, R. C. Oliver, and Millard P. Snyder.

Mrs. Dorman conducted the group on a tour of the bakery, showing us how Holsum Bread is baked. This tour was very interesting.

Mr. Jeff Dykes discussed the programs, past, present, and future, then showed us the movie, "The American Road," produced by the Ford Motor Company. It was enjoyed by all present.

After those present had partaken of light refreshments consisting of coffee and Hostess cup cakes the meeting was adjourned.

MILLARD P. SNYDER, Secretary-Treasurer

THE PROCEEDINGS OF THE LOUISIANA ENGINEERING SOCIETY

SEPTEMBER, 1953

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PROCEEDINGS

OF THE

LOUISIANA ENGINEERING SOCIETY

Vol. 39

DECEMBER, 1953

No. 4

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A Message From Our President. The Louisiana Council of Engineers is composed of representatives of each engineering society in the State, with the President of the Louisiana Engineering Society acting as the Chairman of the Council, pro tem, and the Secretary of the Louisiana Engineering Society acting as the Secretary of the Council. It is the brainchild of our ex-President, Glenn Cappel, whose thought was to have the engineering societies act in unison. It represents, therefore, the major portion of the engineers, and should speak and act for their wishes and best interests. The Louisiana Engineering Society does not presume to be the final agent in important decisions, and can call, through its Secretary, for a meeting of the Council. The decisions of this Council can be important to the engineers of the State of Louisiana.

The Legislative Committee of LES has submitted proposed changes in the Registration (of Professional Engineers and Land Surveyors) Act. The Board of LES has reviewed these recommendations and is ready to offer them to the Council. It would be desirable that each Council member be the head of, or an officer of, his respective professional society so that he may act as the

recognized spokesman of his group. There has been a tendency to treat the meetings of the Council too lightly, which is obviously not to the best interests of the engineers presumably represented.

The Louisiana Engineering Society is growing in size and importance. It is the only composite group of engineers in the State and as such must perform its many functions with utmost deliberation and care. Read the minutes of meetings of the Board of Direction in the Proceedings and you will see for yourself the many problems which arise and must be solved. Frequently Society funds are not available for the handling of these problems to the extent the Board would like. Striving to keep the Society attractive to as many qualified engineers as possible, and because so many belong to national societies with their consequent dues, the Board has always operated the Society at a minimum cost to its members. If we are to rise in stature as a great profession, and, of course, we should, we had best analyze this situation carefully and realize an inherent truth, what benefits the Louisiana Engineering Society benefits our profession and what is more pertinent, ourselves.

Sizeable tasks are requested of our Committee Chairmen and I, for one, cannot praise some of these gentlemen too highly for their work. But,, of necessity, funds are not available to assist them in statistical research and other attendant costs. This is just one of many important problems in this respect that we face. Sober thought should be given to the measures to correct this situation.

MICHAEL C. ABRAHM

Our Annual Meeting. Under the able guidance of Dave Moodie as General Chairman, and Augustus W. Durning as General Vice-Chairman, the following interesting program will be presented:

Thursday, Jan. 7, 1954, Registration at the St. Charles Hotel. At 1 a. m. Lloyd J. Cobb will talk on "Engineering Internationalism." Technical sessions in the afternoon will feature "Jet Air Travel" by Charles Froesch; "Mass Transportation in Metropolitan Communities" by Earl E. Kearns.

On Thursday evening at Dixon Hall, Tulane Campus, Gerald Kerr will speak on "High Fidelity Recordings and Home Acoustics." Demonstrations will be made in connection with this subject. Arthur J. Naquin will receive the Andrew M. Lockett Civic Activities Medal.

At 9:30 on Friday morning, Capt. W. C. Eddy will speak on "Aerial Surveying for Microwave Communication systems." At 10:45 Frank A. Ritchings will give a paper entitled "High Pressure Temperature Trends in Power Plant Design."

Friday afternoon will be devoted to an inspection trip of the harbor, and a trip to Kaiser Aluminium and Chemical Corp. plant.

The University Student Conference will start at 9 a. m. Saturday morning, followed at 10:00 a. m. by a paper on "Control of Old River" by Gen. J. R. Hardin.

The three day annual meeting will close with a cocktail hour dinner and dance on Saturday evening, beginning at 7 p. m.

Engineers' Week. Preparations for observance of Engineers' Week, February 21-27, 1954, were discussed at a meeting of members of the Louisiana Engineering Society appointed to serve on the Committee in charge of the program.

A proposed outline to follow was agreed upon and individual members of the Committee were assigned to handle each phase of the program.

The proposed program includes securing local and state publicity, proclamations by Governor Kennon and mayors of the cities of Louisiana.

Observance would be assured by engineering colleges, high schools and private preparatory schools with prospective engineering students, civic organizations, governmental agencies and industries employing engineers or engineering methods.

Acknowledgment would be sought in cities where a Louisiana Engineering Society section is located, local sections of founder societies and local sections of national engineering organizations.

Window displays and posters were also included in the program. Vice-President Frank McDonald represented President M. C. Abrams of the Louisiana Engineering Society. W. J. Drawe, Jr. and W. S. Nelson were co-chairmen.

The March of Dimes. "The Louisiana Engineering Society, at a recent Board Meeting, unanimously endorsed an invitation to take part in a very worthwhile project, "The March of Dimes" which of course, works towards the fight against Infantile Paralysis. H. L. Lehmann, Past President of the Society, has been named State Co-ordinator for the Society which involves all of the Louisiana Engineering Society State Sections. The assistance of the entire membership towards this drive will be a credit to our organization and we respectfully solicit your cooperation in making this the first of a "humanitarian project" ever undertaken by the Society. This drive will be held during the entire month of January".

MRS. WILLIAM BENJAMIN GREGORY

On Friday, November 6th, 1953, Selina Elizabeth Bres, wife of the late William Benjamin Gregory, former Professor of Mechanical Engineering at Tulane University, died in the American Hospital in Paris, France. Mrs. Gregory had been in Paris for the past several months with her daughter, Angela, who is in France to do a statue of the Sieur de Bienville, which will be erected in Bienville Plaza fronting the New Orleans Union Passenger Terminal. She suffered an attack on November 5th, which was followed by her death the next day. Mrs. Gregory was well-known in cultural circles in New Orleans, and was a member of Le Petit Salon, the Needle Work Guild of America, was active in Red Cross Work, and interested in music. She was the founder of the Woman's Auxiliary to the Louisiana Engineering Society, and served as it's first President, and subsequently became an Honorary President for Life. Mrs. Gregory was an original member of the Era Club of New Orleans.

Mrs. Gregory was the daughter of Jean Baptist Bres and Elizabeth Adams. She is survived by a daughter, Angela Gregory of New Orleans, Louisiana, and a son, William Bres Gregory of Dallas, Texas, and several grand-children — one of whom, Doctor Gregory Stark Ferris, is on the staff of the Charity Hospital at New Orleans. A second daughter, Mrs. Elizabeth Ferris, died some years ago.

The death of Mrs. Gregory is felt with deep regret by her many friends and associates, and she will be missed in the circles in which she so graciously moved in her native New Orleans.

CHARLES M. KERR

New Members. We welcome the following new members into the Society:

For Member

ROBERT A. BANCK, New Orleans; age 38. Endorsed: M. C. Abraham, J. R. Horton, J. F. Vogt, Jr. University of Illinois, B.S.M.E., 1939. Registered M.E., Michigan. Member ASME, Eng. Society of Detroit, Engrs. Club of N.O. Bigelow-Liptak Corp., Detroit, 1936-1953, apprentice Draftsman to Chief Engineer, Riley-Stoker Corp., N. O., District Manager, 1953.

HENRY G. BUSE, New Orleans; age 30. Endorsed: W. D. deLaureal, W. F. Plauche, W. C. Randall. Tulane University, B.S.E.E., 1950. Registered E. E., La. Member AIEE, Tau Beta Pi. DeLaureal & Moses, Field Supervisor, Electrical Engineer, 1950-date.

DONALD C. DELAUNE, Baton Rouge; age 33. Endorsed: T. J. Innes, R. B. Nerf, G. L. Yousko. La. State University, B.S.E.E., 1939. Federal Power Commission, Jr. Engr., 1946-47. Esso Standard Oil Co., Engineer, 1947-date.

FORREST W. EWING, Baton Rouge; age 42. Endorsed: Lawrence Mann, R. B. Nerf, G. L. Yousko. University of Colorado, B.S.M.E., 1931. U.S. Fuel Co., Utah, Machinist, 1935-36. Esso Standard Oil Co., Design drafting, Estimating, Project Engineer, 1937-date.

FORNEY FULLER, JR., New Orleans; age 32. Endorsed: M. C. Abraham, J. P. Fernandez, J. F. Vogt, Jr. Alabama Polytechnic Inst., B.S.M.E., 1943 Registered M.E., Ala. Jr. Mbr. ASME. U.S.A.F., Production Engineering Officer, 1943-46. Westinghouse Electric Corp., Student Engr., 1946-47. Combustion Engineering Corp., Dist., Mts. Engineer, Sales and Mtce. Engineer, District Engineer, New Orleans, 1947-date.

MURRAY M. GILKESON, JR., New Orleans; age 31. Endorsed: L. H. Johnson, Jr., F. W. Macdonald, F. M. Taylor. University of Sou. California, B.E. Ch.E., 1944. Kansas State College, M.S.Ch.E., 1947. University of Michigan, M.S.E. (Met.Eng.) 1951; Ch.E., Ph.D., 1952. Member AIChE, AIMME, Sigma Xi. Registered Ch.E., Met. E., La. U.S. Navy, 1943-46. El Dorado Kansas Foundry Inc., Cost Accountant, Apr.-Sept. 1946. Eng. Research Institute, Univ. of Michigan, Research Assistant, 1949-51. Tulane University, Associate Professor, 1951-date. Humble Oil & Ref. Co., Research Chemist, summer 1952. Consulting Engineer, Chemical, Metallurgical, Corrosion.

PAUL P. KRUTAK, New Orleans; age 47. Endorsed: B. P. Babin, G. W. Hill, B. L. Kiernan, Sr. University of Colorado, B.S.E.E., 1930. Member AIEE. Colorado Fuel & Iron Co., Lineman, Layout structural steel and sheet metals, 1925-27. Westinghouse Electric Corp., Test Engineer, 1936-41; Electrical Field Engr., 1942-46; N.O. Eng. and Service Dept., Electrical Supervisor and Port Engineer, 1947-date.

GEORGE F. MATTHES, Baton Rouge; age 53. Endorsed: L. J. Cucullu, L. J. Lassalle, J. M. Todd. Tufts College Eng. School, B.S. M & E, 1921. Mass. Institute of Technology, M.E., S.M. Degree, 1937. Registered M.E., E.E., La. Member ASME, ASEE. C. T. Main, Inc., Boston, Consulting Engineering, 1929-31. La. State University, Associate Professor E.E., 1932-39; Prof. and Head of M.E. Dept., 1934-date.

LELAND S. MAJOR, Baton Rouge; age 29. Endorsed: O. D. Johnson, T. J. Innes, G. L. Yousko. Louisiana State University, B.S.M.E., 1947. Esso Standard Oil Co., Mechanical Engineer, 1947-date.

MILES G. MYERS, New Orleans; age 38. Endorsed: B. P. Babin, G. W. Hill, D. W. Stewart. North Carolina State College, B.S.E.E., 1938. Registered P.E., Mass. Associate Member AIEE. Duke Power Co., N. C., Switch-board Operator, 1939-40. Westinghouse Electric Corp., Electrical Tester, 1940-43; Supervising Engineer on installation of switchboards, 1943-44; Consulting and Application Engr., 1944-52; Industrial Control Engineer, 1952; Engineering and Service Supervisor, N.O. Branch, Dec. 1952-date.

OSWALD A. MINIERIS, Baton Rouge; age 29. Endorsed: T. J. Innes, R. B. Nerf, G. L. Yousko. Robert College, Istanbul, Turkey, 1944-47, B.S. M.E. 1947. La. State University, 1948-50, M.S.M.E. 1950. La. State University, Assistant Instructor M.E., Research Asst., Eng. Experiment Station, 1948-52. Esso Standard Oil Co., Mechanical Engr., May 1952-date.

DARRELL E. WARD, Baton Rouge; age 30. Endorsed: T. J. Innes, Lawrence Mann, G. L. Yousko. University of Kentucky, B.S.M.E., 1947. La. State University, M.E., 1948-49. Registered M.E., La. Jr. Mbr. ASME. Esso Standard Oil Co., Estimating Engr., 1947-date.

DAVID A. WARRINER, New Orleans; age 58. Endorsed: M. C. Abraham, B. S. Nelson, R. M. Seago, D. W. Stewart. Tulane University, B.E., M & E., 1917. Registered M.E., E.E., La. USNR, Engineer Officer, 1917-18. Dulluth & Williams Shipbuilding Co. and A. M. Lockett & Co., draftsman, engineer, 1918-28. Celotex Corp., draftsman in various design work. The Foxboro Co., representative. Now privately engaged in repair, calibration and re-finishing of industrial instruments.

JAMES W. WYCHE, New Iberia; age 46. Endorsed: M. G. Arnett, T. A. Bonnet, A. M. Bujard. Southwestern La. Institute, B.S.M.E., 1926. Westinghouse Electric & Mfg. Co., design engineer, 1926-34. Self-employed, sales engineering, 1934-49. Johnston Pump Co., District Manager, 1949-52. U.S. Pumps, District Manager, Oct. 1952-date.

For Transfer from Junior to Member

THOMAS A. FROMHERZ, New Orleans; age 29. Tulane University, B.E. in C.E., 1944. Registered C.E., La. Fromherz Engineers, Civil and Structural Engineering, partner, 1949-date.

For Affiliate Member

MACK FARLAND GUINN, Lake Charles; age 24. Endorsed: C. S. Childers, G.B.S. Ricketts, J. P. Tucker. McNeese State College, 1947. Mathelson Chemical Corp., Jr. Engineer, Jr. Draftsman, 1949-date.

JAMES L. GURAEDY, Monroe; age 32. Endorsed: F. W. Adams, R. C. De-freese, J. H. Huffman. La. Polytechnic Institute, E.E., 1946-49. No degree. United Gas Corp., Jr., Engineer, 1952-date.

For Junior Member

FREDERICK J. BAEHR, JR., New Orleans; age 23. Endorsed: W. K. Banks-ton, F. W. Macdonald, D. W. Stewart. Tulane University, BSME, 1951. Jr. Mbr. ASME. Registered M.E., La. N. O. Public Service Inc., Asst. Mechanical Engr., 1952-date.

BISHOP B. GRAVES, JR., Baton Rouge; age 24. Endorsed: T. J. Innes, R. B. Nerf, W. A. Whitaker, G. L. Yousko. Mississippi State College, BSCE, 1951. M. T. Reed Construction Co., Rodman, Chairman, June-Sept. 1949. Miss. State Highway Dept., Jr. Bridge Engr., June-Sept. 1950. Esso Standard Oil Co., Baton Rouge, Project Engineer, June 1951-date.

MALCOLM P. HEBERT, Alexandria; age 27. Endorsed: W. D. Roland, D. J. O'Rourke, Newton Himel. Southwestern La. Institute, BSME, 1951. Missouri Pacific RR, Machinist-Inspector, 1950-51. Charles T. Roberts, Architect, Mech. Engr. & Draftsman, 1951-52. Roland Construction Co., Engr.-Estimator, 1952-date.

GEORGE T. JOHNS, Winnsboro; age 26. Endorsed: A. P. Andrews, T. C. Morgan, S. C. Smith. Louisiana State University, BSCE, 1952. Registered C.E., La. Dept. of Public Works, State of La., Instrumentman, June-Sept. 1948, June '49-Feb. '50; Chief of Party, June-Sept. 1951; Civil Engr. I. Area Engr., June 1952-date.

CLAUDE J. KELLY, JR., New Orleans; age 23. Endorsed: F. W. Macdonald, E. F. Hughes, J. H. Collins, Sr. Tulane University, BSCE, 1951. Registered C.E., La. Sewerage & Water Board of N. O., Civil Engr., July-Nov. 1951. U.S. Navy, Lt. j.g., active duty, Nov. 1951-date.

LEON C. LEONARD, New Orleans; age 24. Endorsed: R. H. Grehan, G. R. Hammett, E. R. Perez, Jr. Tulane University, BSME, 1951. Registered M.E., La. Member Tau Beti Pi. U.S. Navy, Lt. j.g., active duty 1951-53. A. M. Lockett & Co., Ltd., Engineer, June 1953-date.

WILLIAM OGLESBY, JR., Baton Rouge; age 29. Endorsed: R. B. Nerf, W. A. Whitaker, G. L. Yousko. Louisiana Polytechnic Institute, Mechanical Engineering, 1941-43. Louisiana State University, 1946-48, BSME 1948. Magnolia Petroleum Co., Jr. Engr., 1948-52. Esso Standard Oil Co., Project Engr., April 1952-date.

HOMER E. PITTMAN, JR., Baton Rouge; age 25. Endorsed: T. J. Innes, R. B. Nerf, W. A. Whitaker. Georgia Institute of Technology, B.E.E., June 1949. Esso Standard Oil Co., Project & Equipment Engr., 1949-date.

LOUIS G. SPANN, Baton Rouge; age 24. Endorsed: H. L. Lehmann, H. D. Richardson, F. B. Stirling. Louisiana State University, BSME, 1950. Jr. Member ASME. A. G. McKee Construction Co., Cleveland, Jr. Engr.,

summer 1948. General Electric Co., Test Engineer, 1950-51. U.S. Army, 1st Lt., technical classified work in electronics and physics, 1951-53. Gamma Industries, Design Engr., May 1953-date.

WILLIAM S. SPANN, Baton Rouge; age 30. Endorsed: R. H. Bretz, F. B. Stirling, G. L. Yousko. Louisiana State University, BSME, Aug. 1943. Harvard Business School, 1950-52, M.B.A. (Business Admin.) Esso Standard Oil Co., Mtce. & Construction Engineer, 1943-44. U.S. Navy, Ship Supt. handling repair work at Puget Sound, 1944-46. Esso Standard Oil Co., Eqpt. Inspector, Statistical Engr., Process Engr., June 1952-date.

LUCIEN J. VIRGILLIO, JR., Baton Rouge; age 25. Endorsed: E. R. Felton, R. B. Nerf, G. L. Yousko. Louisiana State University, BSEE, 1949; graduate work E.E., 1949-50. Westinghouse Electric Corp., Engineer, 1950-51. Esso Standard Oil Co., Engineer, 1951-date.

ROBERT A. WARRINER II, New Orleans; age 25. Endorsed: D. W. Stewart, R. M. Seago, E. C. Hawkins. Tulane University, BSME, 1947; graduate work Physics, 1947-48. Registered M. E., La. D. A. Warriner Instrument Sales and Service, partner, 1948-date.

JOHN S. WHITE, JR., Baton Rouge; age 25. Endorsed: R. W. Ammon, T. J. Innes, G. L. Yousko. Alabama Polytechnic Institute, BSEE, 1951. Birmingham Southern College, B.A., 1949. Esso Standard Oil Co., Equipment and Project Engr., June 1951-date.

Junior Membership Awards

VERNON W. ASHWORTH, Shreveport; Graduate in Mechanical Engineering, Louisiana Polytechnic Institute, 1953.

ARTHUR A. deFRAITES, JR., New Orleans; Graduate in Civil Engineering, Tulane University, 1953.

WILLIAM H. DUDLEY III, New Orleans; Graduate in Mechanical Engineering, Tulane University, 1953.

EDWARD J. GOLLER, New Orleans; Graduate in Mechanical Engineering, Tulane University, 1953.

NILS E. HANSEN, New Orleans; Graduate in Civil Engineering, Tulane University, 1953.

THOMAS C. HOLLIS, Lafayette; Graduate in Civil Engineering, Louisiana Polytechnic Institute, 1953.

ROBERT E. HOWSON, Covington; Graduate in Civil Engineering, Louisiana Polytechnic Institute, 1953.

JAMES L. KILPATRICK, Haynesville; Graduate in Petroleum Engineering, Louisiana Polytechnic Institute, 1953.

RAYMOND P. MADDUX, New Orleans; Graduate in Mechanical Engineering, Tulane University, 1953.

GERARD R. POIRIER, New Orleans; Graduate in Electrical Engineering, Tulane University, 1953.

JOSEPH G. RICHARD, Baton Rouge; Graduate in Civil Engineering, Louisiana Polytechnic Institute, 1953.

JAMES R. SLEDGE, Ruston; Graduate in Electrical Engineering, Louisiana Polytechnic Institute, 1953.

ARTHUR R. THEIS, New Orleans; Graduate in Civil Engineering, Louisiana Polytechnic Institute, 1953.

THE CURRENT STATUS OF NUCLEAR ENERGY*

Donald H. Loughridge*

To assist in understanding the great increase in reactor knowledge and techniques which has come about since the war, let me first take a few minutes in historical digression. On December 2, 1942 man first initiated a self-sustaining nuclear chain reaction and controlled it. On a squash court beneath the West Stands of Stagg field at the University of Chicago, late in the afternoon of that day, a small group of scientists brought the first nuclear reactor, Chicago Pile No. 1, up to criticality. This was the culmination of a vast quantity of nuclear physics research which had been carried out throughout the previous decade, and particularly that of Otto Hahn and Fritz Strassman in Berlin who in 1938 found the element barium in the residual material from an experiment in which they had bombarded uranium with neutrons from a radium-beryllium source. Further impetus to work on a uranium reactor was given by the discovery of plutonium by Macmillan, at the University of California, in 1940. This element, unknown in nature, was formed by the nucleus of the abundant isotope of natural uranium capturing a neutron and then undergoing two successive changes in nuclear structure. Plutonium, it was believed, would fission as does the rare isotope of uranium. This of course proved to be the case. From the knowledge that the fissioning of uranium produces neutrons which are available to cause the fissioning of more uranium, Fermi, Zinn and their associates at Columbia, early in 1940, attacked the problem of determining how to put together a machine in which the chain reaction could take place and be controlled.

The first assemblies, cubes measuring 8 to 10 feet on a side, were put together at Columbia in the summer of 1941. A radium-beryllium neutron source was placed beneath each pile and the neutron distribution measured. These assemblies were called exponential piles because neutron intensities diminished with distance from the source according to an exponential curve. In May 1942 the exponential pile work was moved to the University of Chicago, and there the increasing supply of uranium and graphite, gradually improving in quality, made possible more rapid assembling and testing of piles. One of the first exponential piles contained powdered oxide (U_3O_8) in metal cans. Machinery was soon set up for pressing the powder into solid shapes so that neutron absorbing cans would not have to be used. Another early pile was sheathed and hermetically sealed with galvanized iron with the

* Delivered at L.E.S. Annual Meeting, January 8, 1953.

intention of removing air, also a neutron absorber, from the assembly.

It was hard, dirty work sawing and drilling graphite bricks, piling up the bricks and lumps of uranium oxide and taking them down, over and over again. The scientists themselves worked with the smudgy bricks. High school boys helped but, of course, didn't know the significance of what they were doing. In addition to the Columbia work, 29 different exponential piles were built at Chicago. By November of 1942 enough metal had become available to justify starting the assembly of a pile in which to attempt to obtain a nuclear chain reaction. The many small exponential piles had verified and supplied detailed information on the type of construction suggested by theory and had given encouraging multiplication factors. In fact, had the uranium and graphite been available, an attempt would have been made months sooner to build a chain reacting pile. Thus the work began which culminated in the successful December 2, 1942 operation and which was first announced to the world in August 1945, a day after the bombing of Hiroshima. The 10th anniversary of the original Chicago reactor operation was celebrated there just a month ago.

The objective for reactor development during the war naturally was the maximum production of plutonium in the minimum time. To this end, three research reactors were constructed at Chicago, the second being essentially the first pile rebuilt at the Palos Park site near Chicago, and the need for which was so great that the job of moving from Stagg Field was essentially completed in 21 days. The next reactor at Chicago was called CP-3 and was heavy water moderated. It was completed in May 1944, while in the meantime at Oak Ridge a graphic reactor named X-10 was finished along with its chemical processing facilities, going into operation early in November 1943 and delivering its first plutonium by January 1944. This X-10 reactor chiefly served as a developmental prototype for the large Hanford reactors. While low pressure air was used for cooling the X-10 at Oak Ridge, water was chosen for the production reactors at Hanford because of the good heat transfer properties of water, well known techniques for handling water under pressure, and the presence, in the form of the Columbia River, of large quantities of good cold water. Thus the Lanford production reactors differ from their pilot, X-10, in cooling. They resemble the X-10 in general design except, of course, being scaled up several times in size and many times in power and plutonium capacity. Thousands of natural uranium slugs, canned in aluminum, are fed manually into the front of the reactor. Shoved out the other end, they are stored under water until going to the processing plant that extracts the plutonium. One reactor

at Hanford uses as much cooling water as a fair sized city with even more features to insure continuity of flow. Canning of the uranium slugs is necessary to keep fission products out of the cooling water and to prevent a chemical reaction between the water and the uranium which would cause the fuel slugs to swell and stick in their channels. Another problem was the proper chemical treatment of water to reduce corrosion of the aluminum cans.

The first Hanford reactor, designed solely for the large scale production of plutonium, started up in September 1944, another in December 1944, and a third in February 1945. When the Commission accepted stewardship of the American atomic energy enterprise, these reactors had served their wartime objective, were rapidly deteriorating, and their future usefulness was in question. At the same time, new production goals made necessary a higher rate of plutonium production than had been attained during the war.

To satisfy this need, the Commission restored existing reactors and built new ones. This program, carried out by the operating contractor, the General Electric Co., added up to one of the largest development, engineering, and construction programs ever undertaken during peacetime. Emphasis was also given the development of new chemical separation processes, and a plan was devised to utilize more efficiently the valuable uranium feed material. Now, expanded production goals are being attained and productivity is higher than at any time in the project's history.

The limited description that can be given does not convey an adequate picture of the vast multi-million-dollar industrial installation which is a part of the large production reactor plant. In addition to the reactors themselves, there are shops for fabricating the canned fuel slugs and chemical processing plants for treating the irradiated slugs that leave the reactor. The water system provides first for filtering and chemically treating the water, and after it is used in the reactor, for holding it in storage basins until its radioactivity is low enough for safe return to the river.

The Hanford production reactors are known as regenerative reactors. Their operation results in the generation of fissionable material. They create plutonium while consuming U-235 as fuel. This comes about as a result of the action of neutrons on U-238. Since the quantity of plutonium produced during a given time is less than the U-235 consumed, the reactors are said to have a gain, or reproduction factor, of less than one.

These reactors are also a special type of regenerative reactor, called converters, because they convert one fissionable material into another (U-235 into plutonium). There are designs for re-

generative reactors to produce the same fissionable material as their fuel. These are known as breeders.

All reactors fueled with natural uranium are converters since they contain an intimate mixture of U-235 and U-238.

The heat generated in the Hanford production reactors—enough in one reactor to operate a central station power plant of fair size—is wasted down the Columbia River. The temperature is too low for practical conversion of the heat into mechanical or electrical power. The reactors were built in utmost haste for the sole purpose of manufacturing plutonium. The problem of building a reactor to operate at a temperature that will efficiently generate steam for turbines is one occupying much of the attention of reactor scientists today.

In the period between the end of the war and the assumption of active administration by the Atomic Energy Commission on January 1, 1947, the reactor development program suffered as the result of a number of unfortunate circumstances within the nation and internationally. Chief of these was the uncertainty as to what the future held for the atomic energy enterprise. The insecurity of scientists and engineers, plus the great need for their services with expanding university programs, brought about a significant loss of manpower. Of more than 7,000 scientists and engineers working for the Manhattan Engineer District just before the war's end, only 1500 were still with the atomic energy enterprise by July 1947.

However, even before the end of the war, consideration was being given to new ideas for reactors. At Los Alamos a so-called water boiler, a low power homogeneous type, was designed and constructed. In this reactor, fuel as well as moderator is a liquid; in fact, they are one liquid. Such a fluid or fluidized reactor is said to be of the homogeneous type because of the uniformity of the matter within the core. This is in contrast to the heterogeneous type which has fuel and moderator separated from each other. When a chain reaction is sustained, the liquid is heated; hence the name "water boiler", though the water does not actually boil in the existing homogeneous reactor. Advantages offered by fluidized reactors include elimination of the fabrication of fuel elements and simplification of chemical processing of the fuel.

Plans for a water boiler were started at Los Alamos in the summer of 1954. The purpose of the undertaking was partly to provide, with simple structure and in short time, a strong source of thermal neutrons for experimental purposes and partly as a trial run in the art of designing, building and operating such units. It was the first of a series of steps from the slow reaction of the CP-1 to the fast reaction of the bomb.

The solution chosen was uranyl sulphate (UO_2SO_4) in ordinary water, referred to as "soup" by Los Alamos scientists. Its container was a 12-inch diameter stainless steel sphere, the optimum shape. The volume of the sphere was nearly four gallons (15 liters); its wall thickness, 1/32 inch. The soup could be dropped quickly through an exit pipe from the steel sphere into a flattened, conical storage basin where it would spread out and be safely below criticality because of the much increased ratio of surface to volume.

Surrounding the sphere was a reflector of beryllium oxide bricks, which added a thickness of four feet. Control was accomplished by a single cadmium rod moving vertically through the beryllium and close to the sphere. The reactor was operated at such low power that neither shield nor cooling system was needed. Because light water was used, the fuel had to be enriched. Oak Ridge's first output of uranium containing more U-235 than is found in natural uranium was supplied for the purpose.

Soon after the war, added progress was made by constructing at Los Alamos a small reactor with some features one would expect the bomb designers to employ. They used fully concentrated, man-made plutonium, the fissionable material produced by the Hanford reactors, and designed the reactor to operate in the fast neutron energy range previously utilized only by the bomb. This is the fast plutonium reactor, dubbed "Clementine" by the scientists in recognition of plutonium's wartime code name, "49", and the "forty-niner" and his daughter of the song.

With highly concentrated fuel a much smaller reactor can be built than with dilute fuel. The critical size is further reduced by operation in the fast range of the energy spectrum because no moderator is used. In addition, there is greater freedom in the selection of structural materials, since nearly all materials absorb fewer neutrons in the fast than in the thermal range.

Clementine's core resembles that of CF-3 or first heavy water type in miniature except that different materials are used. Plutonium fuel rods are suspended vertically in a tank only six inches in diameter and six inches high. The tank is of steel instead of aluminum and the rods are held in a steel frame. The coolant is mercury rather than heavy water.

There is the usual relatively large amount of material surrounding the core in the following order, from inside out: a reflector consisting of an eight-inch thickness of natural uranium; then shielding made up of eight inches of iron, one inch of aluminum, four inches of lead, 30 inches of compressed wood fiber and 12

inches of concrete. The outside shape is almost a cube measuring 12 feet on the side.

The reactor went into operation in the fall of 1946 with a full load power of about 10 kilowatts of heat. At that power the coolant mercury, circulating in a closed system, leaves the reactor for the heat exchanger at about 300 degrees F. The reactor has been rebuilt to operate at higher power. The average energy of neutrons in this fast reactor is one-half million electrons volts. The reactor produces a fast flux of 5×10^{11} neutrons per square centimeter per second. Thermal flux of the order of 5×10^{12} is available by moderating a beam of fast neutrons in an external graphite thermal column.

This reactor is of particular importance in weapons development and is providing information of value to the design of other reactors in the fast energy range. Clementine is the first reactor built in the United States after the war and is the only reactor known to use plutonium as fuel.

Six reactors outside the United States are known to have gone into operation since the war. Two are in Canada at the National Research Council's Chalk River atomic energy project. Three are in England, two at the British Atomic Energy Research Establishment at Harwell, and a plutonium production reactor at Sellafield. One is in France at the Nuclear Research Center near Paris.

In the U.S., reactors presently under consideration are the Experimental Breeder Reactor (EBR), the Materials Testing Reactor (MTR), the "Swimming Pool Reactor", the Homogeneous Reactor Experiment (HRE), the Submarine Thermal Reactor (STR), the Submarine Intermediate Reactor (SIR), and the Aircraft Reactor Experiment (ARE).

The Experimental Breeder, located at Arco, Idaho, is the outgrowth of studies started at the Argonne National Laboratory in 1946. In the beginning it was known as Zinn's Fast Breeder, after the Argonne director who was a leader in the development and design work. Criticality experiments were run at Los Alamos, and Argonne tested mock-ups for operation of controls and the cooling system. Following laboratory development, detailed architect engineering design was completed by the Austin Company of Cleveland. Construction was begun in the fall of 1949 by the Bechtel Corporation, of San Francisco, holder of a contract to build the steel, brick and concrete reactor structure, and to install the control mechanism, ventilating, cooling and other equipment. The reactor core was designed and fabricated at the Argonne Laboratory. It went critical last December and is now in successful operation.

Very different from the uranium-graphite reactors, the Experimental Breeder Reactor will resemble the small Los Alamos

Fast Reactor in some respects. The neutron range of both is the fast portion of the spectrum where energies are of the order of several hundred thousand to more than a million electron volts. However, the EBR can explore portions of this spectrum not reached by the unit at Los Alamos.

The fuel of both is enriched; but instead of plutonium, the EBR will go into operation fueled with uranium metal containing more U-235 than is found in natural uranium. Such enrichment of uranium is accomplished by the gaseous diffusion plant at Oak Ridge. As with the Los Alamos Unit, no moderator is necessary because the reactor is not designed to slow neutrons down appreciably.

There the comparison ends. The EBR is designed for a power level many times that of the Fast Plutonium Reactor, yet it is not very powerful by comparison with the Brookhaven reactor of X-10 at Oak Ridge. The new reactor has a much higher flux density than the Los Alamos unit and will offer more extensive facilities for research with fast neutrons than are now available. The mass of concrete in which the core is embedded contains the usual ports and thermal columns for research purposes.

The Experimental Breeder Reactor is a pioneer in some important features of design. For example, the new reactor uses a liquid metal coolant. It has a small heat exchange unit and turbo-generator power plant—of only 300 kilowatts capacity—the object of which is to test the transfer of heat from the liquid metal coolant to the fluid of the heat engine rather than to produce a significant amount of power. And, finally, the EBR is designed with the hope that it will generate new fuel, more than it consumes.

Taking from a reactor more fuel than it burns sounds like having our cake after eating it. But the idea is theoretically sound. Let us follow neutrons that break their nuclear bounds and gain freedom at up to 30,000 miles per second during the fissioning of the nuclei of fuel in a converter reactor containing U-235 and U-238. Some bounce from nuclei to nuclei of the moderator until they hit fuel nuclei and cause fission again. Others bounce about until absorbed by nuclei of the moderator or another substance; perhaps they escape from the reactor entirely. At any rate, they do no good; they are a liability. Still others bounce about until they hit and are snatched up by U-238 nuclei, causing these nuclei to become uranium-239. This new form of uranium, U-239, is unstable and quickly gives off electrons, turning into neptunium. But neptunium is not stable either; it gives off electrons, becoming plutonium. All this happens in a few minutes.

Obviously, a converter or breeder reactor, to operate with a ratio greater than one, must lose a minimum of neutrons and cause

a maximum to start the U-238-to-plutonium transformations—while sustaining the chain reaction with the original fuel. This is difficult, with an average of only two to three neutrons from each fission, but the outlook is very hopeful. The outlook is brightest for a reactor operating in the fast energy range because coolants and structural materials generally absorb fewer neutrons in this range, and no moderator is required.

Here is an analogy of what happens in a breeder or converter reactor. Compare a coal-burning furnace with a nuclear reactor. Suppose that, in addition to feeding high-grade coal into the firebox, very low grade, cheap and commonly available lignite is added with the coal. Then suppose that the ash pit yields good coal along with ashes. Some of the lignite, let us say, is converted into coal and appears with the ashes. The lignite is analogous to uranium-238, not a nuclear fuel and relatively abundant. The coal fed into the firebox corresponds to uranium-235, and that taken from the ash pit door to plutonium—both good nuclear fuels and both scarce.

At best, however, convertors or breeders are not expected to work magic overnight. The brightest hope is for them to increase eventually the supply of nuclear fuel 139 times, which is the measure of the abundance of U-238 over U-235. Note the word, eventually. The buildup of new fuel will be slow, like the accumulation of money by the compounding of interest with invested principal. Suppose a breeder reactor is able to create six per cent more fuel in a year's time than is tied up in the reactor and its chemical separation plant. And suppose that the six per cent increment can be promptly reinvested in other regenerators so that the equivalent of annual compounding is achieved. Six per cent money compounded annually doubles itself in twelve years. That gives an idea of the outlook.

Certainly, there will be no immediate Utopia; but the creation of any fuel in a reactor producing useful heat is much better than complete consumption of fuel. A combination power-converter or power-breeder reactor producing plutonium to the extent of half the U-235 supplied would consume a net of only five pounds of nuclear fuel, say, as contrasted to ten pounds without any regeneration. It is as though you use only five gallons of gasoline to run the car as far as it used to travel on ten.

Regardless of the actual extent to which conversion or breeding is achieved by the Experimental Breeder Reactor, the future application of nuclear power may be greatly influenced by the results of the experiments in regeneration with this reactor. In addition, experience with the new design features of the EBR will be of immediate value to reactors still on the drawing board.

Next to the EBR, the Materials Testing Reactor, also located at Arco, Idaho, is most interesting. Its start-up period was March 31 of this year. The MTR, as the name indicates, will provide greatly needed facilities for making nuclear tests on materials considered for use in the design of new reactors. This reactor may be compared with the huge mechanical testing machines that supply thousands of pounds pressure to steel beams. Both acquire information essential for progress in their fields. The reactor will also be a valuable instrument of pure research.

The Materials Testing Reactor operates primarily from fissioning caused by neutrons in the thermal energy range, the best known part of the spectrum. However, there is provision for limited use of intermediate and high energy neutrons. The power level of the machine will be fairly high. This reactor is designed to generate about as much energy in the form of heat as the Brookhaven reactor, yet its core will be only a fraction the size of the core of any natural uranium graphite reactor. The similarity of power and contrast of size points up the fact that a large amount of heat will be generated in — and hence will have to be removed from — small volume. This is accomplished, first, by a special design of enriched, enclosed fuel elements with a large surface to speed the transfer of heat from the fuel within, and secondly by a cooling system circulating ordinary water within the core and forced air around it. Heat will be removed so quickly that the reactor will operate at moderate temperatures. The HTR is the first reactor to make use of beryllium, which serves as the reflector. The first quantity of beryllium produced with reactor grade purity went into the reactor. The moderator is graphite, the tank aluminum.

Thus, in addition to serving as a testing facility of first importance, the MTR's fuel elements, cooling system, high neutron flux and reflector material will provide experience valuable to the design of power and fuel producing reactors. Power production was not made a part of the MTR, for such a requirement would complicate design and delay completion.

There are two approaches to developing nuclear reactors. One is to conduct studies on individual problems of a proposed reactor, develop components and assemble them into the big reactor. The other is to build a small, relatively inexpensive pilot model with a minimum of study and development, and acquire information on components needed to design and build the big reactor by operating and experimenting with the model.

The first approach is that of the Materials Testing Reactor and the reactors of the Naval program. The second approach is illustrated by a small homogeneous reactor built at the Oak Ridge Nation-

al Laboratory, as well as the so-called "Swimming Pool" reactor. The former is called the Homogeneous Reactor Experiment because it is intended as a temporary experiment rather than a permanent reactor.

While the homogeneous, or fluidized reactors — to use a breeder term — have their fuel in aqueous solution, it is apparent that there can be other combinations of fuel and moderator. For example, fuel and moderator could be mixed intimately as liquid metal alloys, as gases or as mixtures of powder and gas or powder and liquid (slurry).

The apparent advantages of fluidized reactors over reactors using solid fuel are: (1) Low fuel inventory. A relatively small amount of fuel is tied up in the reactor and in chemical processing. (2) Improved heat transfer. Since the heat originates in a fluid that can carry it out of the reactor core to an exchange unit, one step of heat transfer is eliminated. (3) Less structural radiation damage. A fluidized reactor requires a relatively small amount of structure. (4) Simplified and continuous fuel reprocessing. It appears that reprocessing can be carried on continuously by continuous draw-off, similar to the way a filter keeps oil clean in an automobile engine. In addition, dissolving a solid fuel, returning it to the solid state and fabricating fuel elements is completely eliminated. (5) Safer operation, due to the reactors' negative temperature coefficient. Lower construction and operating costs may also follow.

The Navy became interested in the possibility of developing a nuclear power plant for the propulsion of sea-going craft during World War II. However, naval power plant development was deferred until after the War because all efforts were devoted to the manufacture of fissionable material for the bomb.

The reason for the Navy's interest in nuclear power plants is clear. Any power plant whose fuel consumption is measured in ounces instead of tons, for the same output, would greatly increase the range of operation without refueling. Much bulk and weight of shielding might be tolerated, might even be offset by lack of bulky, heavy fuel oil. Other advantages of nuclear energy for submarines or surface vessels include: (1) Complete independence of the propulsion plant from use of oxygen, a feature which greatly increases the possible submergence time of submarines. (2) Elimination of air intakes, uptakes, stacks, schnorkels, etc., necessary for boiler and diesel power plants. (3) Reduction of hazards incident to the use of batteries and to the storage and transfer of fuel oil.

The advantages are particularly significant for submarines. Since the time a submarine can operate submerged would be increased many times, submarines could be designed for much

higher speed under water than can be attained with present craft built for both surface and submerged operation. Hence a submerged range many, many times that of conventional submarines becomes practical.

A major problem in the development of a nuclear power plant for a submarine is created by space and weight limitations. A reactor for this purpose also presents a special problem of controls, for they must be flexible enough to cope with the variable demands of naval operation. And there are the problems of all power reactors—operation at high temperatures and at high neutron density to get sufficient heat production per unit volume of core. These two heat transfer considerations—temperature and heat per unit volume—increase the difficulty of finding suitable core materials and coolants.

The tempo of the investigations toward a Naval reactor was stepped up when in December 1948 the industrial and engineering know-how of the Westinghouse Electric Corp. was teamed with the forces of the Argonne Laboratory.

Construction of facilities for a land-based prototype of the reactor power plant, known as Mark I, is under way at the Reactor Testing Station in Idaho.

The reactor of the power plant is a single-purpose machine, the first designed for the sole purpose of producing heat for useful power. There is no provision for manufacturing new fuel, testing materials or carrying on research. A direct engineering approach along the best known paths—thermal energy range, enriched fuel, water for cooling—is aimed at getting enough heat out of reasonably small space at temperatures high enough to operate a steam turbine with fair efficiency.

The Mark I installation will consist of a complete power plant of such size and power as to be suitable for operation in a submarine. The power plant's chief units will be the reactor, a heat exchanger or boiler, and a conventional steam turbine. Hot "cooling" water will be pumped from the reactor to the heat exchanger where it will give up its heat to steam for driving the turbine. Radioactivity of the water that goes through the reactor makes the exchange of heat necessary to keep the turbine from becoming contaminated. Following the prototype, it is anticipated that a reactor power plant, known as Mark II, will be built for installation on the submarine NAUTILUS.

Moving toward the construction stage is the Submarine Intermediate Reactor which is being developed for the AEC and the Navy by the General Electric Company at the Knolls Atomic Power Laboratory (KAPL) near Schenectady, New York.

Like the STR, this project consists of a prototype of a complete nuclear power plant (Mark A) which will be built on land, while a Mark B for submarine installation is anticipated. Unlike the STR, the SIR will operate in the intermediate instead of the thermal neutron energy range. In fact, it will be the first reactor in the intermediate range.

Advantages sought in intermediate neutron reactors include less trouble from fission product "poisons" that absorb large numbers of neutrons and low loss of neutrons by capture in materials other than uranium. The net result should be more efficient utilization of neutrons.

The SIR power plant will provide new experience with liquid metal coolants and fuel element design aimed at getting maximum heat out of a small volume at high temperature. It is expected to operate at a higher temperature than the STR and a somewhat higher heat efficiency. The control system is different in important respects from the control of other reactors.

In the same manner that fantastically concentrated nuclear fuel may increase the range of ships and submarines, so fissionable material promises to lengthen the distance an airplane can fly without refueling to a round-the-world order of magnitude. Furthermore, such long range flight can be at the maximum speed made possible by aircraft design. The use of nuclear fuel would also do away with the fire and explosion hazard of gasoline and with problems of obtaining, refining and transporting the bulky and highly volatile liquid.

On the other hand, limitations of weight and space in the application of nuclear power to planes are much more severe than in the case of water-borne craft. Hazards of combustion and explosion would be replaced by new hazards of radiation, and the nuclear fuel would have to be chemically processed and fabricated before the first use and frequently thereafter. Then there is the relatively minor job of strengthening the frame of the plane to take the concentrated reactor and shielding load and land with this load. Today, a large plane's gasoline load is distributed, and aircraft are designed to land with a light load after most of the gas has been consumed or ditched in emergency.

Yet the prospects of nuclear-powered flight are so promising and the achievement so much desired that a major effort in this direction is being made by the Atomic Energy Commission with the Department of Defense and other government agencies and contractors. The development of fast, long-range, high-altitude chemically-fueled planes has been slowed down by limitations of natural law. Today large planes can be built to fly great distances,

but only at speeds and altitudes that make them sitting ducks for interception. Small manned and unmanned planes can be built to fly very fast and reach very high altitudes, but their range is exceedingly limited.

The limits in each case are imposed by the size of the chemical fuel load. Nuclear fuel removes the limitations for planes large enough to carry the heavy nuclear power plant. In fact, nuclear fuel shoves out of sight the horizon to the range-speed combination of large planes and opens up a vast new region for airplane development. This means that with nuclear-powered aircraft, our nation would be able to make photographic reconnaissance and drop bombs on a target in any part of the world with planes operating from home bases within the continental United States.

During the first half of 1951, the Commission began negotiations for a contract with the Aircraft Gas Turbine Divisions of the General Electric Co., Cincinnati, for further development of a nuclear reactor for aircraft. In addition, basic research and development at the Oak Ridge National Laboratory and other projects supported by AEC and the Air Force in the field of nuclear-powered flight are being continued.

Let us now turn to consider the present status of the question of developing civilian power by nuclear energy. Here we of course run into an economic rather than a technical problem. There is no question about the ability to generate electrical power from fissionable material. The only tough question is how to do it competitively with coal and oil.

Like any other form of energy, the long term and uses of nuclear energy will be restricted to those in which it has an economic advantage. This curve is not necessarily smooth, however, because circumstances for a short period may make use desirable even though uneconomic in the sense of dollar cost. In this class may fall such uses as conversion of nuclear energy into electrical energy, or into shaft horsepower or thrust to propel naval vessels or military aircraft and to other end uses not necessarily governed by economics, such as the making of fissionable materials for explosives, or isotopes for radioactive warfare. Conservation of manpower and materials may dictate the use of nuclear energy even at a dollar loss.

Our plan, then, should center around a long range goal to determine whether or not nuclear energy has an economic advantage and in what fields. Due consideration should, of course, be given to the uneconomic but socially desirable uses and the plan must provide for effort toward making these uses as economic as possible.

The goals, thus, are susceptible to division into economic and uneconomic uses. As we have seen, the uneconomic uses generally are desirable only from a military viewpoint and as an unusual means of conserving natural resources, such as manpower and materials, when required as an expression of state policy. By and large, the latter requirement usually is an outgrowth of military or diplomatic exigency. The reasons for these uneconomic uses generally are compelling and must be satisfied on a time basis.

Economic uses, on the other hand, will be slower to develop. This is a natural consequence of economic forces, such as competition and conservation of invested capital. The ability to compete will have to be clear and attractive to investors, be they individuals, corporations, or the government. In addition consideration will be given to the effect on invested capital and a transition will be paced to cause the least loss of capital. Generally, only if the economic advantage is excessive will new capital enter a strange field to overthrow the established investment of others. This is particularly true where large capital investments are required, as is the case in nuclear energy to date. Like all general rules, however, this is subject to exceptions, such as in the case of the desire of the government and West Coast banks and industry to establish a local steel industry in the west. There is a possibility such might be the case with one or more uses of nuclear energy, but it should not be counted on until it becomes apparent.

For some time the Commission has been examining the economics of particular reactor designs for the dual purpose of producing both plutonium and electric power. This examination consists of preliminary studies on certain aspects of the problem. A broader and more intensive approach toward dual purpose reactors was prompted by the urgent need for fissionable material and by a proposal from industry. Also, it was desirable to set new talent to work on the atomic energy program and to do so in a way that would call into play the profit incentives of business to help make for economy and efficiency.

There were other considerations. The AEC had become perhaps the largest single user of electricity in the country. It behooves the Commission to look into the possibility of contributing to the power supply to replace at least a part of the power it consumes. An additional consideration was the fact that the state of reactor science and technology seemed ready for the kind of agreements developed which call for an over-all survey of existing knowledge.

Accordingly, early in 1951 proposals from industry seeking a way for industrial firms to carry a larger share of the task of

developing, building and operating reactors were studied by AEC. By the end of June, agreements had been signed for four joint studies—by Monsanto Chemical Co. and its associate, Union Electric Co., both of St. Louis; by Detroit Edison Co., of Detroit, and Dow Chemical Co., of Midland, Michigan; by Commonwealth Edison Co. and Public Service Co. of Northern Illinois, both of Chicago; and by Bechtel Corp. and Pacific Gas and Electric Co., both of San Francisco.

The four agreements provided for surveys and studies of classified reactor science and technology by the companies (a) to determine the engineering feasibility of their designing, constructing and operating dual-purpose reactors to produce fissionable material and power; (b) to examine the economic and technical aspects of building such reactors in the next few years; (c) to determine the possible research and development needed, and (d) to recommend industry's role in developing, designing, building and operating such reactors. Discussion of the agreements with the contractors contemplated private financing with remuneration to come from the sale of plutonium to AEC and electric power to industry.

Some of the many vexatious problems which we are continually facing in these considerations of planning for power development might be of interest here. Is it more sensible to develop reactors with their prime objective the production of plutonium, with power as a by-product, or should power reactors be the prime objective with plutonium regarded as the by-product. Can we afford to burn plutonium in order to obtain power? How much is the government willing to pay for plutonium if it is produced by utilities as a by-product? For how long will the government guarantee the established price of plutonium? Will utilities be allowed to own their own reactors, particularly if they are producing fissionable materials in addition to power? Will the government loan money for or subsidize in any way plutonium-power or straight power reactors? Will enriched uranium be available? At what cost? Will heavy water be obtainable as required and at what cost? Will companies engaged in the Industrial Participation Program process any patent rights relative to nuclear reactors? These and many more similar questions must certainly be faced, and satisfactory answers obtained during this interim period of time when the technical developments of reactors are advancing so rapidly.

Finally, I would like to review briefly a few of the interesting by-products of our reactor development program.

Fortunately, the technology of aluminum had been well developed before the discovery of fission. Aluminum seemed to be

the best metal for sheathing uranium fuel slugs at Hanford and as the material for tanks of heavy water, natural uranium reactors.

Magnesium and aluminum are generally similar in properties of interest to reactor designers but, unfortunately, both lack the corrosion resistance and strength needed for high temperature reactors. The neutron absorption of steel and copper is too high for thermal reactors. Hence, another material has been developed. Zirconium, most promising for corrosion resistance, strength and workability, is specified for the Submarine Thermal Reactor. Like beryllium, zirconium was a "rare" metal until recently quantity production of high purity metal was developed.

The achievement falls into three steps. The first was removal of impurities, chiefly hafnium which happens to be one of the most avid neutron absorbers.

The second step was development of an existing process, the Kroll process, by the U. S. Bureau of Mines Station at Albany, Oregon for making a "sponge" zirconium.

The third step was the further refining of the sponge at the Foote Mineral Company, Exeter, Pa., and the Westinghouse Atomic Power Division, Pittsburgh. The de Boer process, which had been primarily a laboratory process, was developed to transform the sponge into the more highly refined crystal bar metal.

Hafnium crystal bar has also been made by the Kroll and de Boer processes from impurities taken out of the zirconium.

Improvement of these processes has resulted in reduction of the cost of "crystal bar" zirconium from about \$300 per pound in 1942 to less than \$40 now.

At Brookhaven National Laboratory, a group is developing a method for safe permanent disposal of radioactive materials—or as we sometimes call it—the safe ultimate return of radioactivity to nature. The method hinges on the ability of certain natural clays; (montmorillonite seems to be the best); to pick up radioactivity through the phenomena of ion exchange. The people at Brookhaven have found out something that makes the use of the clay very interesting. They discovered that if, after you absorb the activity on the clay, you heat the material up to about 800° C., the radioactivity is just about permanently fixed within the clay structure. You can soak the material in sea water and various acids and the activity still remains within the clay. This, then, is the heart of the method. One absorbs the activity of the clay. Then he heats the clay and the activity is fixed. The idea then is to take this "hot" clay and, for added protection, deposit it in a naturally occurring bed of similar material. These beds are quite common. Since clay is an end product of rock weathering and little or no seepage or leach-

ing occurs in the clay beds, the geologists and minerologists tell us that with this procedure we can be relatively assured that the radioactivity will be safely immobilized in nature over perhaps geologic period of time. Of course one could not have access to these areas after the active material was deposited.

As with most research and development work, there have been some very intriguing "tangents" associated with this project. First because of the high capacity of these clays for radioactivity and the potency of many radioelements, it is possible to fix rather substantial amounts of activity in a small, readily handled volume. For example, if one were fixing carrier free fission products from our wastes he could theoretically get over 5000 curies of borium¹⁴⁰ in a gram of clay, or 23,000 curies of samarium¹⁵³. Since the gram of clay represents something over a half cc of material, it is immediately apparent that here is a possibility for making high intensity radiation sources.

The medical people have expressed interest in certain aspects of this possibility. First, it seems to be a way of getting high intensities of radiation in a small, solid volume. This is a decided advantage in many instances for radiotherapy. Then, too, the activity is fixed in an inert carrier so that there is minimum of chemical reaction between body fluids and the radiation source. Thus one medical researcher indicated the possibility of injecting small active clay spheres (made by heating the clay in an oxygen torch) into the circulatory system and studying the hydraulics and other aspects of blood flow.



Cabbages and Kings. Cabbages are not yet price supported, but may be in the future; kings are supported under the Point Four Program. Our wacky price-support plan forces American families to buy butter and put it in storage, although these same families use oleo because butter is too high for them to purchase over the counter. You, dear reader, are part owner of 6 million pounds of honey (we must help our bees!), 844 million gallons of cotton seed oil, and vast quantities of some 36 other items. These spoiling surpluses are valued at almost 2 million dollars. This, of course, does not include the storage charges or clerical help required to keep track of them. Farmers are carefully planning for bumper *surpluses next year*. How long can this go on? What do *you* think? Your senator and congressman would like to know.

ENGINEERING BRIEFS

Seeing Stars. Advancing U. S. technology has come into its own in the highly specialized field of building optical planetaria. Designers of the recently completed Alexander F. Morrison Planetarium at San Francisco, and Boston's Hayden Planetarium, now under construction, have had the benefit of electronic computing machines, high-vacuum metal-depositing techniques, and availability of well-made standard lenses and parts, as well as other advantages not enjoyed by the builders of the original 1926 Zeiss instrument and its fellows, now installed throughout the world.

Computing machines have replaced two laborious hand-calculating jobs. For the Morrison projector, designed principally by Mr. A. S. Getten and Dr. G. D. Hanna, punched card equipment classified 3800 stars by magnitude and location, for use in preparing the 32 star plates, or images of the heavens to be projected on the dome of the planetarium. The computer automatically allowed for inversion of the images by the projection lenses as well as distortions introduced both by the lenses and by the off-center positions of the star projector with respect to the dome. For the Hayden projector, designed by the Korkosz brothers of American Planetarium Corp., MIT's Whirlwind I digital computer tested some 45,000 ten- to thirteen-digit numbers, to obtain those which would be most useful in designing the gear trains employed to simulate planetary motion.

Making the star plates is tedious. Actual photographs of the sky cannot be used directly, since no photographic emulsion will record satisfactorily the differences in magnitude, or brightness, among stars, which are readily apparent to the human eye. Furthermore, since the star projector cannot be located in the geometric center of the dome, because of the size of the instrument, improper locations would result. To provide for differences in magnitude and correct placement, the plate makers create holes of the proper size and location by hand in a thin metal sheet or film through which light is projected. The Zeiss planetaria contain star plates of extremely thin copper foil with hand-punched circular holes of varying size to represent magnitude differences.

The Morrison projector star holes were formed, with the aid of microscope, by carefully placing carborundum grains of the proper sizes on the front condenser lens of the projector, vacuum aluminizing the surface of the lens, brushing off the grains, coating the surface with black lacquer, and removing the lacquer over the holes with an acetone-soaked swab. The irregular edges left by the carborundum grains are said to produce more realistic star projections than the circular punched holes of the Zeiss instrument.

It is planned to use modern photoengraving techniques in making star plates for the projector in Boston. Stars will be located and painted by hand on sheets of paper half the size of the final

projection, then photographed and photoengraved on a metal film directly on the condenser lens of the projector system. Differences in star brightness will be achieved through the use of three projection lamps of different intensities, rather than the one source common to previous instruments. As a consequence, the Hayden Planetarium will have more natural-looking star images no greater than half an inch in diameter, as compared to light discs as large as two and a half inches across, previously relied upon to achieve the illusion of greater brightness. About 9500 stars will be represented.

Standard Parts

Speaking well for diversity of production and quality control in the American machined parts and optical industries is the use of standard items in construction of the Morrison and Hayden planetaria. The Zeiss instruments were reportedly handmade with each part specific to its use, with little interchangeability; in case of breakdown, new parts often had to be specially made. The Hayden unit relies to a large extent on standard parts which can be easily replaced, and both the Morrison and Hayden projectors use standard American-made lenses which must meet a specified maximum variation in focal length of less than one percent from lens to lens.

Improvements in the illusion of reality and in lecturer convenience have also been made. Rotating cages over the light sources in the Boston machine will give the appearance of twinkling to the projected stars. In the San Francisco planetarium, in case the regular lecturer has a sore throat, a substitute lecture has been recorded on a magnetic tape, which also electrically cues 250 separate projector operations by means of bits of metal foil attached to the back of the tape. The inner domes of both planetaria are made of lightweight aluminum, instead of the stainless steel formerly used elsewhere. Holes punched in the inner shell of the dome serve both to deaden the lecture space acoustically and to permit the use of special lighting effects in the space between inner and outer domes; visibility of the stars is not appreciably affected. The list of improvements in construction techniques over those used in building the original Zeiss optical planetaria is long, and to a large degree dependent on growth of technology since the latter were designed.

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

* * *

Algae Versus Malthus. Once more technology challenges the Malthusian doctrine. The large-scale culture of algae, the lowest form of plant life, as a source of food for humans and animals and of organic matter for industrial uses, has been demonstrated as entirely feasible technically. Production costs for algae would be higher than those for competitive products in the United States, but the present limited experience indicates that these costs may be

significantly reduced. With a little further development, algal culture may be justified even now in some parts of the world.

Credit for this advance belongs to the Carnegie Institution of Washington. For many years, its Department of Plant Biology in California had been studying the mechanism of photosynthesis, by which plants utilize sunlight for growth. In this work they used single-celled green algae as experimental material. Just before World War II, they began to study mass culture of algae as a possible source of food. The large amount of information since obtained, both in the United States and abroad, is thoroughly covered in a monograph, "Algal Culture: From Laboratory to Pilot Plant," published by the Carnegie Institution. Several of the programs reported are still in progress, and the new book should serve to stimulate further research and development.

After World War II, laboratory work by Carnegie scientists indicated that the results were sufficiently promising for engineering studies to be made. Accordingly, Carnegie retained Arthur D. Little, Inc., to build and operate a pilot plant on a much larger scale than had previously been possible. In this plant, a green slurry of the alga *Chlorella pyrenoidosa* in water, with inorganic salts as nutrients, was pumped through a continuous flat tube of transparent plastic material. The tube was about four feet wide and formed a loop of 150 feet long. The test unit thus exposed to sunlight some 600 square feet of culture medium. Air enriched with carbon dioxide was also continuously passed through the tube. The unit was designed to provide ideal growing conditions for *Chlorella*; it was operated continuously and successfully for three months and produced about 80 pounds of dry material. The unit also provided important operational information.

The product of the pilot plant was used for chemical and nutritional studies. These studies established that materials such as vegetable oils, sterols, and chlorophyll can be recovered, but it is the nutritional value of *Chlorella* which seems to offer the greatest promise. The dry *Chlorella*, containing about 50 per cent protein and up to 20 per cent fats, along with most of the natural vitamins, is the nutritional equivalent of yeast.

The chief economic problem at present is the high investment cost in the growth-plant equipment — over \$30,000 per acre, as estimated in separate reports on the engineering pilot-plant studies. An acre of culture, however, should produce about 25 to 35 tons of dry product annually, many times more than the dry yield of an acre of land under present-day agricultural practice. It has been estimated that the cost of production in the United States would be 25 cents a pound, as compared with competitive vegetable products which sell for about 10 cents a pound today. There is, however,

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good reason to hope that a simpler system can be developed and the yield per acre increased, with an appreciable reduction in both initial cost of equipment and operating expenses.

Current Progress

Of the projects now in progress, one of the most interesting is the pilot plant operating at the Tokugawa Institute for Biological Research in Tokyo. Several food products fortified with *Chlorella* have been made on a small scale, with promising results. Since the average Japanese diet already contains somewhat similar materials, *Chlorella* may be readily acceptable when used directly in human foods to supplement the limited supply of protein available there. Because of the special economic conditions in Japan and the excellent scientists working on the project, that country may well see the first wide-scale use of artificially-grown algae. The opportunity to grow food containing no waste, on land having no agricultural value, requiring only inorganic chemicals, should provide strong incentive for other countries to follow suit. Where *Chlorella* might be less acceptable for human consumption, the mass culture of algae for livestock feed is a real possibility. Although the first use will probably be in other countries, this development may be important to livestock feeders in the United States in the future.

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

* * *

Hue and Why. "The Science of Color" reports twenty-years' work in the physics, physiology, and psychology of color. Yet this comprehensive review by the Colorimetry Committee of the Optical Society of America points out that the process of seeing color remains unknown. Details of the visual system, from the mechanisms in the eye to the visual centers in the brain, remain to be understood before color apprehension can be explained satisfactorily.

The science of color has benefited greatly from the "psycho-physical" concept, in which color is not identified solely with radiant energy, nor with human sensation, but a combination of the two. Color experiences are not mere sensations, or simple responses to stimulation of the retina by radiant energy. Complex mental operations combine different sensations with past experience in recognizing the object initiating the stimulus. Information on the sensory aspects of color is as useful as that on light sources and transmission.

Man's interest in color dates back at least 15,000 years to the cave paintings of southern France. Today, color is important to society and to industry, although few people approach color scientifically. For those who wish to do so, the book outlines scientific

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color specification. Hue, related to dominant wavelength of light; brightness, as compared to a neutral scale of grays ranging from black to white, and saturation, or purity — the “redness” of a red, for example — are the three psychophysical attributes of color. Scientists specify colors in terms of numbers which evaluate these attributes on a scale worked out for the “standard observer.”

The anatomy and physiology of color vision are summarized, with known facts labeled “evidence,” and incompletely understood areas outlined in diagrams. For example, there is no question of the importance of the rod-and-cone mechanisms in the eye as the photosensitive initiators of vision, but other peculiarly organized structures in the retina still require extensive study. The original Young and Helmholtz theory of three kinds of retinal receptors, each sensitive to a different part of the spectrum, and each contributing to the total color response, is still useful. While there is no physiological evidence for three different kinds of receptors, conceivably the single class now recognized may transmit triply differentiated patterns of nerve impulses. Current research seeks further evidence on this theory.

Color Control

Color preference and color harmony are important in fashion and interior decoration. The importance of selecting colors which will sell, without cluttering the inventory, is clearly recognized, but the means for selecting the best few colors are not well known. Commercial color analyzers are useful in standardizing industrial dyestuffs, but successful color control of mass-produced items is still a challenge. Instruments for color inspection are on the market, but industry as a whole has not enough experience to use existing standards for control of color variations. For technicians, the book reviews the physical concepts involved in radiant energy and its measurement, and information on various types of colorimetric calculations.

“The Science of Color” points out that most claims for devices for simple and inexpensive measurement of color have not survived careful analysis. Human observers are still relied upon to a large extent. An individual’s color vision usually improves up to about 25 years of age, then declines gradually until about age 65. Experience, however, often compensates for reduced physical efficiency of the retina. Normal human color vision is rarely surpassed for accuracy, and can be equalled only by the most painstaking technique employing carefully designed and constructed apparatus.

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

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"In the year 1949, this Commission granted six general increases to electric utilities. Two were municipally owned and the average increase was 16.6 per centum. Four were privately owned and the average was 2.8 per centum. During the following year one municipality was granted a general increase in electric rates of 10.5 per centum and a private utility received 6.0 per centum. In 1951, two privately owned electric utilities were granted general increases of 10.6 per centum. To date, during the present year, five general electric rate increases were approved—two to municipally owned utilities averaging 6.4 per centum (plus Jamestown at 18.84 per centum) and three to private utilities averaging 6.9 per centum."

"The City (of Jamestown) had the advantage of issuing tax exempt bonds at an interest rate of 1.6 per centum. While legally absolved from the payment of real estate taxes, both city and county, (the utility) pays the City of Jamestown \$175,000 annually in lieu of taxes although city officials admit that such payment is \$45,000 less than a privately owned utility would pay for State and County, School and City real estate taxes based upon identical assessed valuations.

"In common with all municipally owned utilities, the operation is exempt from the New York State gross earnings tax of 3 per centum and a like percentage on dividends in excess of 4 per centum on paid-in capital stock employed in the State. It pays no taxes toward unemployment insurance or social security. The federal income tax, which absorbs 52 per centum of the net income of privately owned electric utilities . . . does not apply. The foregoing are decided advantages in the operation of any business. . . ."

"Production costs (of the new Jamestown power plant), excluding depreciation, are 6.93 mills per kwh, whereas a nearby private utility generates at a cost of 4.40 mills per kwh, in a com-

† The following, except the table, is extracted from the proceedings of the New York Public Service Commission granting a rate increase of 18.84 per cent to the government-owned power system of the City of Jamestown, New York (Case 15896, Dec. 9, 1952). There is nothing surprising about this report—many of these same facts apply to the Tennessee Valley Authority and other government-owned power systems. But so far, most of them have managed to use their tax exemptions, Congressional grants of capital from the general tax funds, low interest rates or no interest at all, and various other special privileges and subsidies to spread the delusion that government ownership is cheaper than private ownership. (See *The TVA Idea*, by Dean Russell, F.E.E., 1949, 108 pp., 75 cents paperbound).

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1951	—	—	2	10.6%
1952	3	10.5%	3	6.9%

parably small 30,000 kw station. . . . The proposed residential rates to be paid by residents of the City of Jamestown will be \$61,600 (11.4%) in excess of rates now being paid by the customers of a private utility serving adjacent territory. While exact figures and percentages are not available, both Commercial and Industrial schedules also appear substantially higher. . . ."

"It appears, to date, that all the benefits which flow from either partial or complete tax exemption have been dissipated and the residents of Jamestown must pay higher electric rates in all classifications than the neighboring customers of a privately owned utility which bears its allotted share of the burden of supporting government." — *The Foundation for Economic Education, Inc.*

* * *

International Language Used in Science Journals. The root language of the western world, Interlingua, is being introduced into scientific and technical publications as a workable and economical solution to the problems of international communication.

The preceding paragraph, translated into Interlingua, reads as follows:

Le lingua radice del mundo del west, Interlingua, va introducente se in periodicos scientific e medical como un methodo practic e economic de solver le problema de provider summaries de articulos que pote esser legite per specialistas in qualcunque parte del mundo.

Science Service has received a one year grant from the International Auxiliary Language Association to handle introduction, translation and teaching of this "common denominator" language to science and technology editors and other interested persons.

Based on the principal western languages, Interlingua with its simplified uninflected grammar and universal vocabulary is read virtually without study by anyone who normally reads scientific and medical journals. A grammar and Interlingua-English dictionary has been published under the editorship of Dr. Alexander Gode of Science Service.

Already the first scientific journal in Interlingua, *Scientia International*, published by Science Service, is about to enter its second

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year. *Spectroscopia Molecular*, a monthly journal on spectroscopy, is published exclusively in Interlingua under the editorship of Prof. Forrest F. Cleveland, Illinois Institute of Technology, Chicago 16, Ill.

One of the most important aids of Interlingua to science editors will be the use of a single Interlingua summary in place of several summaries in different languages for each of the scientific papers. Thus Interlingua will give both practical and economical advantages over older methods of abstracting.

The Interlingua Division of Science Service located at 80 E. 11th St., New York 3, N. Y. offers translation service to medical and other journals in preparing Interlingua versions of summaries, abstracts, papers, etc. for publication.

Further details concerning Interlingua can be obtained from Dr. Alexander Gode at the New York office, or from Watson Davis, Director, Science Service, 1719 N St., N. W., Washington 6, D. C.

—From *Aminco Laboratory News*.

* * *

New Compound Protects Ferrous Materials From Rust During Storage. A mildly alkaline, water-soluble material known as Enthone Compound NR-31, when used in a concentration of one ounce per gallon, is said to prevent rusting of steel, cast iron, and other iron alloys during storage. It leaves almost no visible film on the material to which it is applied, and is readily removed by washing with water.

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—From *Aminco Laboratory News*.

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MINUTES OF THE MEETINGS AND BUSINESS OF THE SOCIETY

Minutes of Meeting of the Board of Direction Monday, August 10, 1953

The meeting was called to order by President Abraham with Messrs. Macdonald, McNiven, Nelson, Seago, Wallace and Fernandez present. Messrs. Alvin Fromherz and David Moodie also were present by invitation. Mr. McNiven moved that minutes of the preceding meeting be accepted as read, seconded by Mr. Nelson and carried.

Mr. Fromherz, the Society's representative on the Building Code Committee for the Greater New Orleans Area, gave a very favorable report on the activities of this committee, which was accepted by the Board with appreciation.

Mr. Moodie, Chairman of the 1954 Annual Meeting, reported on the progress of his committee and announced that a meeting of same would be held on Monday, August 17.

The secretary read a letter from Mr. F. W. Macdonald, Executive Secretary, Louisiana State Board of Registration for Professional Engineers and Land Surveyors, which included a joint resolution passed by that board and the Louisiana State Board of Architectural Examiners. Mr. Nelson moved that the Board of Registration for Professional Engineers, etc., be commended for its part in coordinating the overlapping functions of each board. It also was decided that the resolution be printed in the proceedings for information to L.E.S. members.

A letter from the Task Force Committee, National Association of Manufacturers, requesting the L.E.S. to pass resolutions concerning reduction of national and state government expenditures, was read. The secretary was instructed to reply, expressing the views of the individual board members present at the meeting.

There being no further business, the meeting adjourned.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Louisiana Engineering Society held jointly with the Louisiana Section, American Society of Civil Engineers Monday, August 10, 1953

The meeting was called to order by President Abraham with approximately 125 members and guests present. The president welcomed members and guests of the Louisiana Section, ASCE. Minutes of board meetings of June 8 and July 27 were read, followed by relinquishment of the chair to Mr. Sargent F. Jones, Chairman, ASCE.

After the conduct of their business, Mr. Lionel J. Cucullu introduced the speaker of the evening, General Peter A. Feringa, Executive Assistant to the President, New Orleans Public Service Inc. and former President of the Mississippi River Commission, who gave a most interesting talk on "The Making of a Military Engineer".

Following General Feringa's address, President Abraham resumed the chair and 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 Monday, Sept. 14, 1953

The meeting was called to order by President Abraham with Messrs. Davis, McNiven, Nelson, Perrilliat, Seago, Wallace and Fernandez present. Mr. John L. Porter also was present by invitation. Mr. Seago moved that minutes of the preceding meeting be accepted as read, seconded by Mr. Wallace and carried.

A report of the Horseshoe Pitching Committee for the Annual Outing was read.

A report of the Vocational Guidance Committee was read, and Mr. McNiven moved that Chairman Cucullu and his committee be commended for their excellent work and advised that no further report would be required at the end of the year. Motion seconded by Mr. Wallace and carried.

Mr. Porter, L. E. S. representative on the Citizens' Planning Committee, reported on the activities of this committee and stated that he and Mr. Dusenbury, the Society's other representative, had attended a total of 70 meetings in connection with the committee's work. President Abraham thanked Mr. Porter for his generous cooperation and added that the board had no idea the undertaking would require so much time.

A letter from Professor Donald Derickson, Chairman, Louisiana State Board of Registration for Professional Engineers and Land Surveyors, was read in which it was advised that Mr. J. J. Munding, a member of said board, had resigned because of ill health. In accordance with law, the L.E.S. must submit to the Governor a list of names from which Mr. Munding's successor will be chosen. After some discussion the selection of candidates



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was tabled until the next meeting in order that board members might give careful consideration to the matter.

Mr. Seago moved that Mr. Ralph Compagno be reinstated to his former grade of Junior Member in the Society, seconded by Mr. Nelson and carried.

The meeting then adjourned in order that the Society's regular meeting could begin on schedule.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Meeting of the Louisiana Engineering Society

Monday, September 14, 1953

The meeting was called to order by President Abraham with approximately 120 members and guests present. Mr. Charles P. Knost moved that the reading of minutes of the preceding meeting be dispensed with, seconded by Mr. R. N. Graham and carried. The secretary then read minutes of a meeting of the Board of Direction held on August 10.

President Abraham introduced Mr. William M. Davis, President of the Lake Charles Section, Dr. Wayne P. Wallace of the Baton Rouge Section, and Mesdames Pearl Pierce Burke and Alberta L. Young, the Society's only two members of the fair sex. He also requested Mr. John L. Porter to take a bow, and announced that Messrs. Porter and Allan Dusenbury, the L. E. S. representatives on the Citizens' Planning Committee for the Greater New Orleans area, had attended 70 meetings in accomplishing the committee's work.

Mr. B. M. Dornblatt then addressed the Society briefly on the United Fund campaign, after which Mrs. Young introduced the principal speaker of the evening, Mr. A. P. Claudet, Consulting Geologist, who gave a most interesting and instructive talk on "The Measurement of the Angle of Dip and Direction of a Strata in a Bored Hole".

Following the usual question period, the meeting closed with a rising vote of thanks to the speaker.

JOHN P. FERNANDEZ, Secretary-Treasurer

Minutes of Regular Meeting of the Louisiana Engineering Society

Held jointly with the

New Orleans Section, American Institute of Chemical Engineers

Monday, October 12, 1953

The meeting was called to order by President Abraham with approximately 100 members and guests present. The president welcomed the A.I.Ch.E., after which he introduced Mr. H. L. Landry, President of the Society's Baton Rouge Section, and Mr. E. M. Gillen, President of the Shreveport Section.

Mr. Knost moved that reading of minutes of the preceding meeting be dispensed with, seconded by Mr. Geo. W. Hill and carried. The secretary then read minutes of the September meeting of the Board of Direction.

Attention was called to a new television program sponsored by Brown's Velvet Ice Cream Company, dealing with communist activities in the United States, and to a showing of motion pictures dealing with New Orleans schools at the Engineers Club on Wednesday October 14th.

The chair then was relinquished to Mr. Henri J. Molaison, Chairman, A.I.Ch.E., and after the conduct of their business Mr. Charles L. Williamson introduced the principal speaker of the evening, Mr. Walter L. Badger, Consultant Chemical Engineer of Ann Arbor, Michigan, who gave a most interesting and entertaining talk on "The History of Chemical Engineering". The chair was returned to President Abraham, who closed 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 Monday, Oct. 12, 1953

The meeting was called to order by President Abraham with Messrs. Gillen, Kelly, Landry, Macdonald, McNiven, Nelson, Seago, Wallace and Fernandez present. Messrs. H. L. Lehmann and Charles M. Kerr also were present by invitation. Mr. Nelson moved that minutes of the preceding meeting be accepted as read, seconded by Mr. Seago and carried.

A draft of minutes of a meeting of the Louisiana Council of Engineers held on September 28 was read, in which it was brought out that the lack of draftsmen, technicians and skilled tradesmen is seriously hampering the construction industry and that steps should be taken to secure the improvement of Delgado Trade School by the city authorities. Whereupon President Abraham appointed Messrs. George A. Heft, H. C. Swan and Carroll Lee Wood to form a committee to study the matter and make recommendations.

The treasurer presented a financial report for the third quarter of 1953, in which it was disclosed that the Society's finances are up to par.

The secretary announced that 346 ballots had been received in the Sep-

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tember membership election and that all members had been elected to their respective grades.

A financial report of the 1953 Annual Outing as read.

Mr. Wallace, Chairman of the special committee appointed to study proposed changes in the registration law, explained the findings of his committee and presented a report, copy of which is attached hereto. The secretary was instructed to forward same to the Legislative Committee and request their comments.

A letter from Brown's Velvet Ice Cream Company, announcing their new Television program of special interest to United States citizens, was read, and it was decided to call attention to same at the general meeting to follow.

A letter from the Times Picayune Publishing Company, requesting endorsement of their application to establish a new T-V station in New Orleans, was read and the secretary was instructed to comply with this request.

A letter from the State Board of Registration for Professional Engineers and Land Surveyors was read, announcing that Mr. Leo M. Odom's term of office would expire on November 11. After some discussion the secretary was instructed to submit the following names to the governor from which appointment shall be made to fill this vacancy:

Ernest M. Freeman, Ardis D. Jackson, Leo M. Odom, Horatio N. Ogden, T. Ellis Peak and Wendel C. Sorensen.

The secretary was instructed to write a similar letter recommending the following names for selection of an appointee to fill a vacancy created by the resignation of Mr. J. J. Mundinger:

Frederick N. Billingsley, Lionel J. Cucullu, Bernard M. Dornblatt, Walde-mar S. Nelson, James M. Todd.

President Abraham reported on a meeting he attended with reference to the March of Dimes, when the Society was asked to assist in this campaign on a state-wide basis. The president then advised that Mr. Lehmann had accepted the chairmanship of a special state-wide committee to handle this work. Mr. Lehmann then briefly outlined his plans, after which Mr. Macdonald moved that he be congratulated upon his willingness to undertake this worth-while project. Motion seconded by Mr. McNiven and carried.

Mr. Nelson moved that the treasurer be authorized to pay expenses incident to the campaign to the extent of \$50.00. Motion seconded by Mr. Kelly and carried.

In accordance with the constitution, it was moved by Mr. McNiven, seconded by Mr. Seago, that Mr. Clifford E. Johnson's election be considered void because he has failed to accept same by payment of dues. Motion carried.

Mr. McNiven moved that Mr. Osborne J. Dykes, Jr. be reinstated to the grade of member, seconded by Mr. Seago and carried.

With the consent and advice of the board, President Abraham appointed the following Nominating Committee for the 1954 election of officers: John A. McNiven, Chairman, Leo J. Lassalle, Wm. H. Rhodes.

Some discussion followed concerning the salaries of engineering faculty members and the recent report of the Special Activities Committee headed by Mr. Cappel which was submitted to the Louisiana Civil Service Commission. The meeting then adjourned in order that the regular meeting of the Society could begin on time.

JOHN P. FERNANDEZ, Secretary-Treasurer

Report of Special Committee to Review the Report of July 2, 1953 of the Legislative Committee of the Louisiana Engineering Society.

In order that the State of Louisiana will be numbered amongst the States having the highest standard for registration as a Professional Engineer and that a license as Professional Engineer issued by the State of Louisiana be valid in nearly all of the other States, the Special Committee, after considerable reading and deliberation recommends that the Report of the Legislative Committee of the Louisiana Engineering Society of July 2, 1953 be returned to the Legislative Committee with a request that they consider in the light of recent recommendations of the Annual Report to the National Council of State Boards of Engineering Examiners by the Committee on Engineers-in-Training of that Council and the deliberations of the panel of speakers of the American Society for Engineering Education held at Gainesville, Florida, June 25, 1953, the following recommendations with respect to the proposed changes in Act 73 of 1950, State of Louisiana.

Section 2 D

Delete the new sentence . . . Said practice includes the doing of such architectural work as is incidental to the practice of engineering

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. . . . This matter, we believe, has already been satisfactorially arranged by joint action of the Louisiana State Boards of Architectural Examiners and Louisiana State Board of Registration for Professional Engineers and Land Surveyors.

Section 12

All candidates with the exception of those being considered under 12(1)a take the written examination in the basic engineering subjects.

All candidates with the exception of those being considered under 12(1)c take the written and oral examination on professional practice.

Section 12(1)b

Professional practice examination to be added to this section.

Section 12(1)d

Change heading from (d) to

(2.) As an ENGINEER-IN-TRAINING

a. Engineer-in-Training. Graduation or experience

Section 12 (2)

Change heading from (2) to (3).

Section 15

Change REGISTERED ENGINEER to PROFESSIONAL ENGINEER.

In sentence beginning Each registrant hereunder shall

. . . . Change shall to may.

We believe that the changes to Act 73 of 1950 can be made simpler by virtue of these recommendations since there will be no difference between graduates of any school, all will stand on their own merits.

We further believe that these changes will place engineers registered in Louisiana in an unchallengable position in other states.

Respectfully submitted,

CLAIBORNE PERRILIAT

MALLARD SEAGO

WAYNE P. WALLACE, Chairman

Minutes of Meeting of the Lafayette Section, Louisiana Engineering Society
October 13, 1953

The October meeting was held at Poor Boy's Riverside Inn at 7:30 p.m. on October 13, 1953.

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

The minutes of the previous meeting were read and approved as read. New members and guests were introduced.

President Boudreaux appointed the following to comprise the Programs Committee: H. R. Mason, A. J. Bonnet, J. E. Jarman, and A. M. Bujard. Mr. H. R. Mason was selected chairman.

President Boudreaux appointed the following to comprise the Membership Committee: R. J. Cambre and J. E. Jarman. Mr. R. J. Cambre was selected chairman.

President Boudreaux requested that he be allowed to retain chairmanship of the Vocational Guidance Committee. Mr. A. J. Bonnet moved that President Boudreaux retain chairmanship of the Vocational Guidance Committee. The motion was seconded by Mr. J. E. Jarman and carried.

The need for publicity of the chapter was discussed. The President appointed Mr. D. J. O'Rourke in charge of publicity.

A discussion relative to the formation of a Ladies Auxiliary was held. Also discussed were means of increasing the membership and improving attendance.

Mr. H. R. Mason suggested a change in the by-laws relative to the time of nomination of officers by the Nomination Committee. This was discussed and Mr. L. C. Landry moved that a copy of the proposed changes be sent to the members and voted upon. The motion was seconded by Mr. J. E. Reed and carried.

Mr. D. J. O'Rourke moved that the next meeting be a dinner meeting and held at Poor Boy's Riverside Inn. The motion was seconded and carried.

Mr. J. E. Reed extended an invitation to the members to attend the public opening of a 25,000 KW station at Baldwin on October 24-25.

Mr. J. E. Jarman announced that the showing of a film pertaining to the construction and driving of concrete piles and pre-stressed concrete was to be held by the Baton Rouge Section at 7:30 p. m. Thursday, October 15. Mr. Jarman offered transportation for all members interested in attending this meeting.

There being no further business to discuss the meeting was adjourned.

ALFRED W. SCHOEFLER, Secretary-Treasurer

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Minutes of Annual Meeting of the Lake Charles Section, Louisiana Engineering Society, July 27, 1953

The meeting was called to order in the Columbia Southern Club House at 7:30 p. m. by W. M. Davis. Thirty-five members and guests were present.

Mr. Davis asked if there were any objections if the reading of the minutes of the previous meeting be dispensed with due to a full program. There were no objections.

There was no old business and no new business was brought up.

A number of visitors were present. Those of the Instrument Society and the AIEE were recognized.

Dick Ward introduced Captain Spotswood of the local airbase public relations office. Captain Spotswood then introduced the speaker of the evening, Mr. J. W. Kenny of the General Electric Gas Turbine Division. A film, "The Jet Story" was shown. Mr. Kenny then talked on the history of jets in Europe and the type and limitations of propulsion plants for air crafts.

After a question and answer session, the meeting was adjourned at approximately 10:00 p. m.

C. R. McBRIDE, JR., Secretary-Treasurer

**Minutes of Meeting of the Monroe Section, Louisiana Engineering Society
September 1, 1953**

The Monroe Section of the Louisiana Engineering Society met in the Cameo Room of the Virginia Hotel, Monroe, La., Sept. 1, 1953. The meeting was called to order by Monroe Section President Mr. J. T. Folk, Sr.

The minutes of the previous meeting were read and adopted and the Secretary gave a membership and finance report.

Following the Secretary's report guests and new members were introduced. Other members present were requested to introduce themselves, indicating the company or agency with which they were associated. This resulted in a count of 38 members and eight guests present.

After the introductions were completed a report was received from the Membership Chairman and this resulted in considerable discussion regarding new and prospective members.

At this time the meeting was turned over to Mr. H. M. James, Program Chairman, and a very interesting film furnished by the U. S. Department of the Interior entitled "Construction of the Hoover Dam" was presented.

No further business was presented and the meeting was adjourned for the refreshment and fellowship portion of the meeting.

Minutes of the Special Meeting of the Shreveport Section of the Louisiana Engineering Society held September 22, 1953

The special meeting consisted of a barbecue held at Camp Soda, the Caddo Parish Police Jury's camp, near Shreveport, La., at 5:30 p. m. Fifty-two members and guests were present.

President Gillen extended thanks to the Caddo Parish Police Jury for use of Camp Soda, instructed the Secretary-Treasurer to do so formally by letter.

A good time was had by all.

Note: Correction to the Sept. 1 Minutes: Line 17 should have read "How Wonder Bread is Baked."

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DECEMBER, 1953

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