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# THE REFRACTORIES INSTITUTE



## REPORTS TO THE MEMBERSHIP

### Ninth Annual Spring Meeting

THE GREENBRIER  
WHITE SULPHUR SPRINGS, W. VA.  
June 25 and 26, 1959

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NOTE: Text of talk by Mr. J. Roy Price, Assistant Director, Office of Civil and Defense Mobilization, Washington, D. C., on "The National Program for Industrial Survival" is attached.

## MINUTES OF THE MEMBERSHIP MEETING OF THE REFRACTORIES INSTITUTE

Held June 25 and 26, 1959 at The Greenbrier, White Sulphur Springs, W. Va.

Total attendance including guests was 83 men and 60 ladies. Attendance list is appended.

President J. E. Brinckerhoff presided and Avery C. Newton, Executive Secretary, acted as secretary of the meeting.

Minutes of the last membership meeting held at The Broadmoor, Colorado Springs, Colo., on Sept. 11 and 12, 1958, previously submitted by mail, were approved.

The chairman announced that at a meeting of the Board of Directors just concluded, J. B. Arthur had been unanimously elected President of The Refractories Institute for the ensuing year. Other officers re-elected were F. H. Laube as Treasurer and Avery C. Newton as Executive Secretary. The membership expressed its appreciation to retiring President Brinckerhoff by a round of applause.

The report of the Treasurer, copy appended, for the fiscal year ended March 31, 1959, was received and ordered placed on file. In the absence of the Treasurer, the Secretary reminded the membership that, to provide funds for increased expenses, the Board of Directors had authorized an increase in dues rate effective April 1, 1959 for Active Members from \$5.00 to \$7.00 per year per production employee. Dues for Active Members on a minimum basis and for Associate Members were increased from \$150.00 to \$210.00 per year.

Mr. W. H. Peterson, Jr., chairman of the Golf Committee, thereupon reported on plans for the Golf Committee. The president announced that Mr. Peterson had resigned as golf chairman, at the conclusion of this meeting, after a service of four years, and that he had accordingly selected Mr. J. R. Rhodes to serve as chairman. The membership expressed its appreciation to Mr. Peterson by a round of applause.

The President then called upon Mr. L. J. Trostel, chairman of the Technical Advisory Committee, for his report, copy appended.

Mr. Kenneth A. Rugh thereupon reviewed the highlights of the very successful Factory Operators Meeting held April 2 and 3, 1959 at Columbia, Mo., of which he served as chairman. The report of the proceedings had previously been mailed to the membership. Mr. Rugh commented on the interest and participation in the program on the part of the operators and urged that the membership continue to support this very valuable annual meeting for production employees. He also mentioned that the Award Contest for the best papers on refractories was most successful with 3 prize winners out of 15 excellent papers submitted. He urged continued support of this new activity of the Operators Meeting.

It being 11:45 A.M., the meeting adjourned until 10:00 A.M. the following day.

Upon resuming the sessions, the President introduced a distinguished visitor, Mr. Colin Stein, president of John G. Stein & Co., Ltd., Bonnybridge, Scotland, and asked him to take a bow.

The President thereupon reported several activities of The Institute and actions of the Board of Directors as follows:

1. Kolb Refractories Co., Philadelphia, Pa., was elected an Active Member effective April 1, 1959.
2. Kaiser Aluminum & Chemical Corp., Oakland, Calif., was elected an Active Member effective July 1, 1959.
3. The Palletizing Manual has been revised and will be republished this Fall. Major changes include a

complete revision of the section devoted to the number of brick per pallet to increase the underweight units for some types of refractories. This will reduce the number of pallets involved in a shipment and will facilitate meeting minimum freight car weight requirements. This has been accomplished mainly by creating four weight groups instead of the present groupings by silica, clay and basic brick.

4. The Institute will carry an advertisement in the 1960 Engineers' Job Directory, as it did this year, seeking inquiries from graduating engineers. Respondents are referred by The Institute office to those companies which have advised that they are seeking employees with specific engineering backgrounds.
5. The Institute will resume publication of arbitration decisions, under the direction of the Labor Relations Committee, as received from members. This should be an invaluable aid to the membership.

The President thereupon called on Mr. W. S. Lowe to report on a proposal his committee had made to the Board of Directors to collect additional industry data.

Mr. Lowe stated that considerable confusion still prevailed in the minds of the general public, financial institutions and many others not immediately associated with the refractories industry as to the importance, magnitude and strength of the industry we represent. He advised that his committee felt there was a real need for accurate refractories industry statistics to be collected from member companies by a disinterested accounting firm and reported annually in total. Such statistics are presently available to the public insofar as certain individual public held companies are concerned. He stated that his committee had recommended that the following data be collected on an annual basis:

1. Total capital investment.
2. Total dollar sales.
3. Total investment per employee.
4. Total sales by industry classification, such as: steel, glass, petroleum, etc.
5. Total capital invested in research and development.
6. Total sums spent annually on research and development.
7. Total annual expenditure for exploration and development of new raw materials.

Mr. Lowe advised that the Board had expressed considerable interest in the proposals and, as a first step, had instructed the Secretary to secure estimates of the cost from an accounting firm and to report back at the next Board Meeting.

Mr. W. A. Turner, chairman of the Mellon Institute Committee, thereupon presented his report. He advised that his committee and the Board of Directors felt that the Refractories Fellowship at Mellon was an essential part of The Refractories Institute. The rising cost of operating the test department of the Fellowship had prompted the committee to submit to the Board several proposals to assess costs. The Board rejected the proposals and voted to continue to meet the operating deficit of the test department out of The Institute's dues income. The committee was requested to continue its efforts to find ways and means to cut costs.

Mr. Turner again urged that the membership make greater use of the test facilities at our Fellowship at Mellon. We have the equipment and the staff to make tests—we need your orders.

The President then called upon General Counsel W. J. Kenney who presented a report, copy appended, on the

current status of percentage depletion. At the conclusion of his report, Mr. Kenney introduced Mr. Brooke L. Gunsallus, recently retired from the Bureau of Mines, who had been employed by The Institute to make an industry survey of tonnages and value of refractory fire clays mined and sold by the refractories industry.

Mr. Stuart M. Phelps, Director of the Refractories Fellowship at Mellon Institute, thereupon summarized the activities of the research and testing departments of the Fellowship for the past year and described some of the plans for the future. Copy of his report is appended.

The President thereupon introduced our guest speaker, Mr. J. Roy Price, Assistant Director of the Office of Civil and Defense Mobilization, who gave a most informative talk on "The National Program for Industrial Survival". Text of Mr. Price's remarks is appended—it is well worth careful study.

The President reminded the members that the next Membership Meeting will be held at the Grand Hotel, Point Clear, Ala., on Oct. 8 and 9, 1959.

There being no further business to come before the meeting, upon motion, adjourned.

AVERY C. NEWTON, Secretary

### REPORT OF GENERAL COUNSEL

Since the last membership meeting of The Refractories Institute, the refractories industry has been plagued by percentage depletion problems. It has been the period of greatest depletion activity since the inception of the percentage depletion deduction in 1951. The problems have arisen on all governmental fronts: legislative, administrative and judicial.

#### Legislative

The Treasury Department on Feb. 11, 1959, commenced its all-out drive to solve the problem of the depletion "cut-off" point in accordance with its own preconceived notions. On this date the Secretary of the Treasury forwarded to the Speaker of the House of Representatives Treasury proposals for amendment of Sec. 613(B) of the 1954 Revenue Code. These amendments excluded from ordinary treatment processes "blending with other materials, treatment effecting chemical changes, thermal action and molding or shaping". The evident purpose of this wording was to establish for the refractories industry a cut-off point immediately after the crushing and grinding processes. However, the Treasury proposals did not recognize the elementary administrative problem which has for eight long years harried both the refractories industry and the Revenue Service, namely, the method of arriving at the value of crushed and ground refractory clay.

The Treasury proposal was referred to the House Ways and Means Committee which held public hearings on the Treasury proposals commencing March 5, 1959. The Treasury Department in its presentation placed greatest emphasis upon the loss of revenue by reason of successful and pending "end product" depletion litigation and urged that "end product" depletion be ended as contrary to the congressional intent in granting percentage depletion. The heavy clay and cement industries were focal points of the attack.

The Refractories Institute was represented at the industry hearings and, while acquiescing in the proposed "cut-off point," vehemently urged that no such cut-off point should be imposed unless simultaneously a statutory method of establishing a market value of refractory clay at this point was provided. The method proposed by The Refractories Institute required the use of prices shown in published price lists and actual sales for valuing crushed and ground refractory clay for depletion purposes. This posi-

tion is in line with the historic position of the refractories industry since they first were granted depletion in 1951.

Some two weeks were consumed in the hearings and many industries appeared. It early became obvious that the Treasury proposals were highly unrealistic and would result in greater uncertainty and litigation while also unintentionally affecting the long established depletion of many industries. As a result, the House Ways and Means Committee has deferred all action on the Treasury proposals but has indicated the possibility of appointing a sub-committee to re-study the entire percentage depletion question as to both rates and the cut-off point.

#### Administrative

**Regulations under 1939 Code**—The Treasury Department on Feb. 10, 1959, proposed retroactive revisions of the depletion Regulations under the 1939 Internal Revenue Code, by re-defining the words "clay, refractory and fire", and "quartzite". The effect of these belated re-definitions would be to define "refractory and fire clay" as clays having a P.C.E. of 19 or higher, which might exclude some portion of the pouring pit refractories from the 15% depletion rate. The proposed re-definition of "quartzite" would require that the material be a compact rock so tightly cemented that it breaks across the grains rather than around them and thus might exclude pebble rock from all depletion for 1951-53. These definitions were exactly contrary to long standing rulings defining both "refractory clay" and "quartzite" in terms of actual suitability for refractory production.

Public hearings were held on these proposals on April 2, 1959, at which time The Refractories Institute was represented and presented a brief pointing out that the definitions were contrary to the congressional intent to include as "refractory clays" all clays actually used for refractory purposes and to include pebble in the term "quartzite" and, further, that the proposed re-definitions might retroactively deprive their materials of depletion to which the Revenue Service had long agreed. No action has been taken to date to amend or finalize these proposed Regulations.

**Regulations under 1954 Code**—The industry will recall that the Treasury Department on Nov. 3, 1957, proposed depletion regulations under the 1954 Revenue Code to which the refractories industry filed vehement protests. There have been successive rumors that these Regulations were being amended; would be re-proposed for further hearings or would be finally adopted. In view of the fact that the proposed Regulations as they related to the "cut-off" point are similar to the Treasury proposals so hostilely received by Congress it seems that the Regulations after more than two and one-half years are no nearer final adoption.

#### Judicial

**End Product Depletion Cases**—The U. S. Circuit Court for the 7th Circuit on June 15, 1959, decided the government appeal in the *Cannelton Sewer Pipe* case. It affirmed an earlier District Court decision in favor of the taxpayer allowing "end product" depletion. Cannelton produces sewer pipe manufactured of a combination of shale and fire clay. This is the first appellate case in which the government has established substantial nearby sales of raw crude fire clay at prices less than taxpayer's own clay production costs. The government contended alternatively that either there was a local market for raw fire clay which established the "cut-off" point for Cannelton or that there was a national market which established the "cut-off" point. This has been described as the "least processing" theory. The Circuit Court met the problem squarely and held that, while, as distinguished from the *Cherokee* cases,

there was a substantial market for raw fire clay, the question of the commercial marketability of clay hinged upon the market of the particular taxpayer involved and that to establish a commercial market for clay it must be shown that the taxpayer could sell a substantial portion of his production at an earlier stage at a profit. The fact that a particular taxpayer's mining costs were greater than the per ton selling price in the area would establish a lack of commercial marketability at an earlier stage and thus Cannelton was entitled to "end product" depletion.

This case is most significant in that it is the first appellate case involving a situation where a market at an earlier stage does in fact exist and will become a leading decision on the problem. Further, it demolished the government's new "least processing" theory. A copy of the Cannelton decision has been furnished to each member company.

There have also been two recent District Court decisions, allowing "end product" depletion on non-refractory products manufactured in part from fire clay.

*Sparta Ceramics Co.* (wall tile) (N.D. Ohio, 1958) 169 F. Supp. 401; *Pacific Clay Products* (sewer pipe) (S.D. Cal. Oct. 30, 1958) AFTR (2d) 873.

These decisions are currently under appeal by the government to the 6th and 9th Circuit Courts, respectively, along with two other non-clay depletion cases, *Iowa Limestone Co.* (28 T.C. 881), 8th Circuit, and *California Portland Cement Co.* 3 AFTR (2d) 428, 9th Circuit.

The government is making an all-out effort to win at least one of these cases on appeal in order to again attempt to bring the matter before the Supreme Court of the United States on the basis of a conflict of decision among the Circuit Courts. The government had previously unsuccessfully attempted to obtain Supreme Court review of the *Dragon Cement*, *Cherokee* and allied decisions.

**Stripping Contractor Depletion Rights**—The Supreme Court of the United States in the case of *Parsons vs. Smith* on April 6, 1959, finally set at rest the rights of the stripping contractor to the percentage depletion deduction. The Court decided that the stripping contractor possessed no economic interest in the mineral and was not entitled to claim percentage depletion although he had a substantial investment in equipment where the stripping contract met the following requirements:

1. The contract could be terminated on short notice (here 10 days).
2. The price paid for the stripping was a fixed price per ton having no relation to the time of sale or the price at which the mineral was ultimately sold.
3. The stripping contractor had no right to sell any portion of the coal but was obligated to deliver all coal mined to the owner.

The foregoing requirements are in line with those which the refractories industry has been pursuing for many years. While the refractories industry generally has had no percentage depletion problems with respect to the depletion rights of stripping contractors, this decision sets at rest a very troublesome problem which has been hanging over this industry.

**Refractory Litigation**—The refractories industry has now reached a position where it must choose its course of action. We have attempted by agreement with the government to use crushed and ground clay as a "cut-off" point and to use published market prices to arrive at the value of the clay at this point. Now we find Treasury using raw clay as a "cut-off" point and low sales prices or proportionate profits to reach its value at this point.

The result is chaos with no member of the refractories industry knowing either the appropriate cut-off point for his product or the value to use at that point. Generally,

the income tax returns of members of the refractories industry are open for the eight years 1951 to 1958. The result of this unascertained liability on the corporate balance sheet is too obvious for comment.

In view of this chaotic situation various members of the refractories industry have reached a decision to litigate the problem on the basis of "end product" depletion. *Harbison-Walker Refractories Co.* has filed a refund suit for the years 1951 and 1952 in the District Court for the Western District of Pennsylvania and this case is now in pre-trial status. Other producers will shortly file "end product" refund suits in their respective District Courts. I earnestly recommend that all members of the refractories industry should, if they have not already done so, file refund claims based on "end product" depletion in order to preserve their rights. There seems to be no present hope for compromise with the Revenue Service and the whole problem must now be litigated in court. Frankly, I do not believe that we can assume that, because one or two cases are successfully litigated, the Revenue Service will grant the same treatment to non-litigating refractory manufacturers. Prior experience would indicate that all members of the industry must be prepared to separately litigate to receive the benefits.

In litigation the refractories industry has a substantial chance to win through to "end product" depletion. As distinguished from other clay consuming industries, the refractories industry has definite and high quality standards for the clays which are necessary to produce a product which will meet its customers' service requirements. This should serve to distinguish the raw materials used by the refractories industry from the large body of clays commonly known as "fire clay", the great part of which is of too low quality for use in refractory production.

**Action by The Refractories Institute**—We have seen from current litigation and Treasury policy that the government refuses to recognize a difference between "refractory clay" and "fire clay", although both terms are used in the statute. The Revenue Service insists blandly that all clay having a P.C.E. of Cone 19 or higher is "refractory clay" and that all refractory clay is thus identical and that thus defined there is a market for raw refractory clay. If this contention is successful, it will result in substantial elimination of percentage depletion for the refractories industry.

Generally in the clay litigation to date the government has attempted to establish a market and a value for raw fire clay by subpoenaing neighboring producers to testify as to their sales and/or purchases of clay and the prices at which the transactions occurred. This type of evidence can be handled in each suit by distinguishing each producer's clay from the refractory clay used by the particular taxpayer on the basis of chemical and physical qualities. The government is also increasingly leaning on national statistics.

The chief source has been the clay statistics reported in the *Minerals Yearbook* issued by the United States Bureau of Mines. The *Minerals Yearbook* statistics show substantial sales of fire clay in raw form in all major clay production states at low prices.

While there are valid legal objections to the admissibility of the *Minerals Yearbook* in evidence, the fact is that these figures have been admitted in evidence by the Trial Judges in both the *Sparta* and *Standard* fire clay cases, and were extensively used in the *Cannelton Sewer Pipe* briefs on appeal. It seems certain that these statistics will be admitted in evidence in any refractories depletion case. These figures are, on their face, damaging.

We must recognize that these statistics will be fully exploited by the government unless they can be successfully combatted. This is a very difficult problem. The statistics of the Minerals Yearbook report on all fire clays and include not only refractory clays suitable for use by the refractories industry but also large tonnages of clays of all grades consumed by other clay industries such as brick, tile, sewer pipe, etc., most of which are wholly unsuitable for refractories use. Generally speaking, refractories manufacturers sell negligible quantities of their clays in raw form. However, to establish this in Court may be exceptionally difficult.

In no trial to date have the Minerals Yearbook statistics been successfully controverted by the taxpayers. In recognition of the probable development of this problem the Board of Directors of The Refractories Institute has obtained the services of Mr. Brooke L. Gunsallus, recently retired from his position with the Bureau of Mines where he served as a commodity specialist in the Branch of Ceramics and Fertilizer Materials. Since 1930 he had conducted the surveys of the clay industry which resulted in the Minerals Yearbook statistics. Mr. Gunsallus had complete charge of the clay section of the Minerals Yearbook and personally collected and compiled the statistics; correlated them and wrote the section. Mr. Gunsallus is currently engaged in preparing the necessary statistics to segregate refractory clay tonnage from the Minerals Yearbook statistics. We have called upon all members of the refractories industry to furnish their retained copies of the Bureau of Mines clay reports for the years 1951 to 1954, inclusive. These reports show for each reporting company the type of clay, the tons mined, the tons sold and the tons processed into finished product.

This is a major enterprise and has already, though incomplete, demonstrated the fact that the refractory producers do not sell any significant quantity of their clay in raw form. In order that Mr. Gunsallus's results will have any validity in court it will be necessary to have complete cooperation of all refractories producers. Members of the industry producing more than 60% of the tonnage have already turned in their retained copies of the Bureau of Mines questionnaire. There are, however, some producers who have not as yet done so. We can assure you that each member's individual figures will be kept in utmost confidence and that only the resulting statistics will be made public. Following the completion of this work, Mr. Gunsallus will then conduct a survey of the refractories industry designed to establish the grades and types of clays used in the industry and the statistics as to any purchases of raw clays by members of the refractories industry during the years 1951 to 1954.

Mr. Gunsallus's services as an expert witness will be essential in depletion litigation by any member company and will be available to all participating members as the Board of Directors of The Institute may determine.

Respectfully submitted,

WILLIAM J. KENNEY, General Counsel.

### TECHNICAL ADVISORY COMMITTEE REPORT

The committee has held two meetings in the interval since the Spring Membership Meeting of The Institute at Hot Springs, Va., May 6, 1958. One meeting was held in Cincinnati, Ohio, on Dec. 3 and 4, 1958, the other was at Columbus, Ohio, June 15 and 16, 1959, with The Institute Counsel and Secretary present.

#### Technical Research

The committee has continued to work closely with the Fellowship on its research program involving several pro-

cess studies and new test methods. Both the quality of the work and its progress have been completely satisfactory. This will be further evident from the detailed report of the Director of the Fellowship.

During each of the past three fiscal years the funds appropriated for various studies, research and general activities, other than sales of service or testing, have been increased. This continued and increasing support of research by The Institute, tending to make it the main activity of the Fellowship, has had several gratifying effects. It has made it possible to bring some of the projects undertaken, to completion, increased the status of the Fellowship at Mellon Institute and, undoubtedly, made our customers more aware of our industries' interest in developing and applying technological advancements.

We believe that the best interests of the industry will be served by a continuing research program at the Fellowship tailored to fit the funds available and conforming to the type of facilities which can be adapted to the Fellowship laboratory.

**Process Studies.** A current project on the prevention of the balling of fireclays is practically completed. A special bulletin on the findings has been distributed to the members and furthermore, the work was presented at the last Operators Meeting. The committee has agreed that a slight extension of this project should be undertaken. This would cover the most efficient method of spraying into the mix the additive which is required to prevent balling.

A second study on pressure cracking is now ready for intensive study. The work has been detailed and the required apparatus is on hand. It is expected that data of considerable usefulness will be obtained.

**Test Investigations.** Active work continued in the past year on the development of two tests of particular value to both the industry and the users of refractories. One of these was a much needed method and apparatus for measuring the spalling resistance of silica brick. Committee C-8 has just recommended this to A.S.T.M. as a tentative standard. The apparatus is available at the Fellowship for use by Institute members.

Further improvements in the apparatus and method for measuring the consistency of castables have been made. The committee members have obtained considerable data in their laboratories which along with quantities of numerous types of castables have been made available to the Fellowship for parallel testing. Important consumers have been kept abreast of the developments. As a result of an investigation of methods of mixing castables as well as refinements in the meter, it is now possible to express the consistency index in terms more closely approaching the water contents of castables normally recommended by the manufacturer.

In the overall program of future planning, several new problems have been considered. It is the intention in selecting such problems to give priority to those of most practicable significance and which at the same time can be fitted into the Fellowship facilities. A fertile field in this connection, which will not be overlooked for possibilities, is the Operators' meetings.

#### Fellowship Testing

The inability to break even on these costs have been the joint concern of our committee and the Mellon Institute Committee. We reviewed two factors late last year considered to be responsible for decreasing income, viz., the then current industrial depression and the increasing number of captive laboratories. There appeared to be some promise of alleviation from the first factor but to bring costs more in balance, we recommended dropping of at

least one of the more unprofitable and less used services. This action, however, remains a moot question.

It is impossible to overlook the fact that the Fellowship Testing Department still remains the chief and in many instances the only place in the country where acceptable referee tests can be conducted with confidence for both the manufacturer and user of refractories. Taking into consideration all the factors involved, it appears that to keep all services in a continuous standby condition of availability, it apparently will be necessary for The Institute from time to time to subsidize this activity.

### Census Reports

Our special subcommittee met at the Census Bureau in Washington with the Industry Division on Jan. 16, 1959. The object of this meeting was to propose for their consideration certain further revisions in shuttle form MA32C and the quarterly Facts for Industry. Our chief suggestions were to decrease the possibilities of double reporting, applying particularly to granular materials produced by the industry; also to subdivide insulating brick into three classes.

The Bureau continues to be highly cooperative and appreciative of the various suggestions made and proposed to put the above revisions into effect.

It was decided to cease collecting data on refractory dolomite and leave this to the Bureau of Mines since it is one of their normal functions. The coverage of dead burned magnesite, however, will be improved to cover all companies on the basis of a list provided by the subcommittee.

The subcommittee also had a session during the above visit with the Export or Foreign Trade Division to determine the feasibility of drafting a reclassification of the groupings of refractories. Presently these groupings lack system and clarity. It is hoped that the classifications of the two divisions of the Bureau can be eventually made uniform. The Export Division has had a Technical Committee of outside consultants but without any representation from our industry.

This project has since been made an assignment of The Institute Secretary by the Board with the technical assistance of the T.A.C.

### Technical Bulletins

As part of our program of keeping The Institute members advised of certain technical developments, Bulletin No. 100 was published during the year. This paper entitled "An Infrared Drier for Rapid Moisture Determinations" was a contribution of E. B. Willis of the A. P. Green Co. The instrument should prove useful in maintaining the proper moisture content at the mixing pan during pressing.

Another paper is on hand and scheduled for early publication covering modern instrumental methods for the analysis of refractories. It is a contribution of W. S. Treffner of the General Refractories Co. It will point out the use being made of the X-ray, electric arc and high temperature flames to determine the constituents of refractories. The small space occupied by the instruments and the large number of very precise analyses possible daily has made the devices attractive additions to quality control facilities.

### A.S.T.M. Information

A number of the actions of Committee C-8 in the past year are of special interest.

#### 1. Specifications.

(a) In our 1957 report we referred to the initiation by C-8 of a project on a specification for "Steel Pouring Pit Refractories" to include ladle brick, sleeves and nozzles.

A completed specification has just been recommended by C-8 to the A.S.T.M. for adoption as a tentative standard. It will be part of the Annual Report of C-8, shortly to be directed to members of The Institute.

(b) Specifications for "Insulating Fire Brick for Linings of Industrial Furnaces Operated with a Neutral or Oxidizing Atmosphere". This refers the user to the existent A.S.T.M. "Classification of Insulating Fire Brick" (A.S.T.M. designation C155) for selection of the proper class of brick depending on the temperature of usage. A warning is inserted that the selection of brick to be heated on more than one side may necessitate the use of a class of higher temperature than usual. Separate dimensional tolerances for both molded and machine-ground brick are a novelty.

(c) Refractories for Incinerators. Several revisions are being proposed for the brick specification (A.S.T.M. designation C106). To make it conform to more modern practices in municipal incinerators, it is likely that super duty fireclay brick and silica carbide brick will be added.

(d) Size Tolerances. The well known tolerances of  $\pm 2\%$  for dimensions of 4 in. or over and  $\pm 3\%$  on dimensions smaller than 4 in., under which the industry has tried to operate over the years, were questioned again in C-8 this past year as being too lenient. C-8 has included these tolerances in only the specifications for brick intended for boilers, incinerators and malleable iron furnaces (See A.S.T.M. designations C63, C64, C106, and C153).

It may be remembered that the A.I.S.I. published a review of these tolerances in 1946-47 and found them adequate. By 1958, their views became divided. Last year C-8 took cognizance of this feeling and discussed the desirability of having closer tolerances for uses other than those in the A.S.T.M. specifications just mentioned. The matter was referred to the C-8 Advisory Committee to make an assignment for future study.

#### 2. Classifications.

The only activity of the past year on this type of standard has been on a classification of basic brick based on magnesia content. Progress has been made but to date there has been no recommendation to C-8 for action.

#### 3. New Standard Tests.

(a) Resistance to Thermal Spalling of Silica Brick. This was referred to previously under the Fellowship research activities.

(b) Thermal Conductivity of Plastic Refractories. A standard test has been recommended by C-8 to A.S.T.M. for adoption. This highly useful procedure, like the one adopted last year on castables, is largely a development from the efforts of C. L. Norton, Jr., of The Babcock and Wilcox Co.

Respectfully submitted,  
L. J. TROSTEL, Chairman

## REPORT OF THE REFRACTORIES FELLOWSHIP

### Testing Department

The extensive facilities of the Testing Department, which are maintained solely for use by each member of The Institute, were employed during the year by 89 members. Percentage-wise, 68% of the active members submitted samples and 21% of the associates. The dollar-volume of test work handled was 14.6% below the average for the preceding 5-year period. The number of tests conducted, however, was close to 50% lower than the average for the same 5-year period. Obviously, a higher charge per test was involved during last year's business, but only part of this resulted from the price increase made effective in August, 1958.

Accounting shows that a different type of testing is now being conducted, much of the work being special in nature for one reason or another, along with a sizable number of orders requiring rush service. It is of interest to note that in the case of the more usual type of testing, the only significant upswing percentagewise pertains to hot load tests in variety, which increased 21%, based on similar work conducted during the preceding 5-year period. Because of the installation of panel spalling equipment in many plant laboratories, that test showed a drop of 37%, on the same basis, and the number of reheat tests declined 30%.

Refractoriness, as determined by the P.C.E. test, involves the largest number of samples to be handled, and during the past year this category showed a decline of 40% over the preceding years. Records show that the average number of samples included in a furnace run was less than three, whereas some few years ago sufficient samples were received to allow close to three times that many test cones to be included in a run. The cost of conducting the P.C.E. test is increased further by the fact that approximately 25% of the samples tested require a check run for assurance of the correct end point on the basis of the accuracy strived for.

There has been pointed out from time to time that the Testing Department of the Fellowship cannot be expected to operate economically unless the members submit a sufficient amount of work to provide the minimum "production volume". The staff in that department has been reduced as far as is practical for quite some time, this being to maintain three shifts for night runs which, incidentally, have increased at a surprising rate by reason of the special and long-time testing schedules called for. Certain tests are, of course, carried out under semi-automatic control, as for example, in the case of a current carbon monoxide test running for 1,000 hours.

Discussion and inquiries have shown that the membership is very much interested in having the independent testing facilities of the Fellowship available when they require certain tests and notarized reports, but are indifferent when it comes to supporting it on an economical basis by submitting a sufficient volume of test work for a healthy operation. One reason, of course, is that many companies have over recent years installed their own laboratories. In this connection, there should be kept in mind that the Fellowship charges for tests cannot begin to compare with those of plant laboratories because of not being engaged in the same degree of routine testing. In addition, the tests are carried out in strict accordance with standard procedures, which provides a higher degree of accuracy in the results than those often sought for or obtained by the plant laboratory. The plain facts are that in order to have available the testing service of the Fellowship for routine, special, and referee work, each member company should support its activity.

### Studies

**Silica Spalling.** A procedure for evaluating thermal spalling of silica refractories originally developed by the Fellowship many years ago has been adopted by A.S.T.M. as a tentative standard. Even though much thought and attention has been devoted to a means for expressing numerically the degree of spalling occurring in the test, there is still much to be desired in that direction. Currently, additional work is being done by the Fellowship on a novel and promising improvement in the test which should give more pertinent information and offers the possibility of obtaining a numerical end point. This is to be accomplished by means of an electrical circuit which indicates the instant and the temperature at which a ther-

mal spalling crack develops in each specimen. Such a refinement in the test would not alter the present equipment but could be added to it. Furthermore, the newer method would reduce the total testing time appreciably.

While on the subject of spalling, it might be well to point out that the Fellowship now conducts spalling tests for regular and super duty fireclay refractories, basic and silica brick, as well as on blast furnace linings.

**Castable Consistency Meter.** Castables have become an important item in the large variety of refractory products available to industry. An indication of the variety of this material on the market is shown by the fact that there are almost 500 brands listed. A short time ago Committee C-8 of A.S.T.M. developed a classification for castables, and this covers six classes of the regular product and four of the lightweight. Keeping in mind that a classification delineates a rather broad group of materials, and that the materials under each class may be divided further for specification work, it is apparent that there is a great variety of castables to be considered from the technical standpoint. Obviously, there should be available reliable test methods for evaluating the properties of castables. The need is not only from the standpoint of the manufacturer for control and cataloging purposes, but in addition, many consumers purchase on the basis of a specification.

The work of the Technical Advisory Committee and the Fellowship, in cooperation with Committee C-8, has resulted in standardizing a number of features in such a testing program. An item of primary importance, however, is the matter of preparing the cast brick to be used for the tests. This immediately involves the amount of water to be used so as to develop the proper consistency for each castable. A change of half a per cent (0.5%) in the water content can have a pronounced effect, not only on the consistency but upon other properties as well. Currently, the means used to arrive at the proper consistency is considered a weak link in the test method, and it is for this reason that the Fellowship has devoted considerable time to the development of the consistency meter.

The apparatus as originally issued for trial purposes was found to be most satisfactory in performance because of eliminating human judgment and by supplying reproducible results. It was decided, however, that the range in consistency which it covered represented too high a water content; consequently, the T.A.C. recommended further development of the meter so as to enable measurements to be made in the range of stiffer consistencies.

The change in properties resulting from less water in the mix posed a more serious problem than was anticipated. During the course of the additional work, literally dozens of changes and modifications were made in the meter, and in the course of the study over 650 tests were carried out on 32 brands of castables. The investigation brought out also the desirability of making use of a mechanical mixer for the preparation of the small test sample so as to more closely duplicate the mixing operations used in the field and to reduce still further personal factors. Consequently, a small hand-operated mixer was designed specifically for use with castables.

The results obtained by the modified meter on test batches prepared in the new mixer were of sufficient promise to warrant a cooperative study between plant laboratories and the Fellowship. This program involved 24 brands, each having been carefully tested for certain properties by the plant laboratories, after which part of each plant sample was sent to the Fellowship for evaluation by the revised meter. This involved carrying out 180 additional consistency tests in order to obtain the information

required for judging the suitability of the meter and the new hand-operated mixer. These data and those obtained by the plant laboratories were discussed during a recent T.A.C. meeting. The findings showed that the modified meter measures the range of consistencies desired, and consequently, a tentative end point was agreed upon.

The Fellowship will supply the parts required for modifying the 15 meters now in various laboratories so that they in turn can conduct further testing. The final design of the hand-operated mixer will be developed and will be made available either in the form of drawings or as a unit constructed by a selected machine shop.

It is expected that at a later time Committee C-8 of A.S.T.M. will consider this test method for adoption as a standard.

**Balling Studies.** The important findings obtained during the Fellowship study of the balling of fire clay mixes for dry pressing have been presented to the membership in the form of a 37-page special report dated April 14, 1959. During the course of the work, 12 progress reports totaling 120 pages were issued from time to time, and at a later date the material will be prepared for submission to a national publication.

The scope of the original study was to learn of the nature and cause of balling, but upon investigation so much was learned about how and why it occurs that it was decided to continue the work to explore possible preventive measures. Furthermore, during the course of the work there was demonstrated the important undesirable condition caused by balling, which is to prevent the uniform distribution throughout the mix of the plastic clay and the fine particles of flint clay or grog.

The cause of balling, expressed briefly, was found to be in the behavior of the exceedingly fine particles of the plastic or bond clay of the mix. The abnormally large area of the very fine platelike clay particles, along with their surface activity, causes them to have a strong affinity for water. During the mixing operation, the wetting of these particles causes them to adhere strongly to each other, and agitation brings about a snowballing action and balling takes place. Provided all the plastic clay could be moistened at the same instant, or in a very gradual and uniform way, balling would not be expected to occur. It was for this reason that the use of very fine sprays was found to be so effective in reducing balling, as compared with the ordinary means used to add water in plant operations.

Studies were made also on the behavior of various types of mixers to reduce balling and, in conjunction with these, the spraying of water in varying degrees of particle fineness on to the batch during preparation.

A simple test method was presented for the purpose of predicting the tendency of various bond clays to ball, and this should be useful for plant control work and especially when bond clays are to be selected or purchased on the market.

In the field of preventive measures, the treatment would be aimed at reducing the normal behavior of the very fine particles in a way that would cause the plasticity to be lowered. Here, as is often the case in the treatment or modification of materials for the refractories industry, the cost per ton of ware of the additive or the operation involved places definite restrictions on the field of possibilities.

Low-temperature heating of a bond clay will alter it by virtually destroying its plasticity. The temperature does not have to be over 800 F and for only sufficient time to assure complete treatment of the layer of clay being handled. A rather simple piece of plant equipment made of

heat-resisting metal could be designed for the operation so that the major cost would be the fuel required, providing waste heat were not available. Furthermore, in most cases only part of the bond clay used in the mix would have to be so treated; the actual amount would depend upon how prone the clay is to ball.

The chemical treatment of those clay particles that cause balling was studied extensively, and some 30-odd compounds which held promise were investigated. Fortunately, the chemicals in the category which would be useful in this field would have to be used only in very small quantities to be effective. When added in amounts of the order of a few tenths of a per cent of the clay, a pronounced change in the behavior of the clay occurs. Obviously, the additive must be soluble in the mix water since it is desirable to have the minute quantity of the chemical come in contact with as many clay particles as is practical. The effect produced by the chemical upon the plastic clay takes place instantly, and it is for this reason that the atomized spraying of the mix water containing the additive is so much more effective than when introduced in any other way. The exact nature of the change which takes place in the clay by treatment varies, depending upon the type of additive used; nevertheless, the over-all effect is to lower the plasticity and thereby reduce its tendency to cause balling.

As a result of the study, the chemical selected and recommended for plant trials proved to be effective in laboratory use by reducing balling 70% in the control mix when used in the amount of 0.1% of the plastic clay content of the mix (40%). These tests were made by atomizing the batch water containing the additive on to the mix. The cost of the chemical per ton of mix in this instance would be \$0.26. That figure would vary in practice, depending upon how much bond clay were to be used in the mix and how prone the clay is to ball, which in turn would determine the amount of additive required. The above example, however, is a good indication of the order of the cost of treatment which may be expected.

These brief highlights on the study of balling are only an indication of the large amount of useful information contained in the report covering what is believed to be a successful outcome of the study. The report should be most helpful and interesting to plant operators, and it was for this reason that an outline of the work was given during the last Factory Operators meeting. As a result, requests were received from 62 parties attending that meeting for copies of the report.

Because of the effectiveness of fine sprays in reducing balling when used either for the addition of water or water containing an additive, it is now planned to obtain rather extensive information on the subject of spray nozzles. This will be assembled in a manner which would be useful to show plant operators what can be obtained on the market along with suggestions on a practical means of judging their effectiveness.

Respectfully submitted,  
S. M. PHELPS,  
Director of Research and Tests

### MEMBERSHIP REPORT

#### From 1958 Spring Meeting to 1959 Spring Meeting

At the end of the 1958 Annual Spring Meeting held at The Homestead, Hot Springs, Va., on May 8 and 9, 1958, The Refractories Institute had 87 Active Members, 29 Associate Members and 6 Honorary Associate Members.

Elected since then were 3 Active Members, 4 Active Members resigned, 3 Active Members were merged or

consolidated with others and 3 Associate Members resigned.

The total membership after the meeting of the Board of Directors on June 25, 1959, is therefore 83 Active Members, 26 Associate Members and 6 Honorary Associate Members.

#### New Active Members

General Refractories de Mexico, S. A., Monterrey, Mexico.

Kaiser Aluminum & Chemical Corp., Oakland, Calif.

Kolb Refractories Co., Philadelphia, Pa.

#### Active Members Merged and Consolidated

Freeman Fire Brick Co., Canon City, Colo., sold to Harbison-Walker Refractories Co.

Laclede Christy Co. Div. and The McLain Fire Brick Co. Div. merged to form Refractories Division, H. K. Porter Company, Inc.

Refractories plant at Ione, Calif., of Pacific Clay Products, Los Angeles, Calif., sold to Harbison-Walker Refractories Co.

#### Active Members Resigned

Armstrong Cork Co., Lancaster, Pa.

Denver Brick & Pipe Co., Denver, Colo.

Murray Refractories Co., Murray, Utah.

West Virginia Fire Clay Manufacturing Co., Pittsburgh, Pa.

#### Associate Members Resigned

Hanley Co., New York, N. Y.

Andrew S. McCreath & Son, Inc., Harrisburg, Pa.

The Ohio Knife Co., Cincinnati, Ohio.

#### ANNUAL ELECTION OF DIRECTORS

The Nominating Committee on Jan. 27, 1959, submitted the following recommendations for Directors which were adopted by mail vote of the Active Members of The Refractories Institute. The committee comprised: L. Y. Greene, Chairman, F. H. Atwood, R. A. Hitchins, W. S. Lowe, L. E. Whitesell. In accordance with the by-laws, the Board of Directors set May 29, 1959, as Election Day. List of Directors elected for a one year term follows:

J. B. Arthur, Mexico Refractories Co.

F. H. Atwood, Harbison-Walker Refractories Co.

J. E. Brinckerhoff, The Babcock & Wilcox Co.

E. E. Davis, The Davis Fire Brick Co.

H. P. Eells, Jr., Basic Incorporated.

E. W. Ernst, Louisville Fire Brick Works, Inc.

W. A. France, J. H. France Refractories Co.

E. A. Garber, Harbison-Walker Refractories Co.

L. Y. Greene, General Refractories Co.

R. A. Hitchins, National Refractories Div.

T. Kauffman, The Ramtite Co.

R. W. Knauff, The Chas. Taylor Sons Co.

F. H. Laube, Freeport Brick Co.

W. S. Lowe, A. P. Green Fire Brick Co.

E. F. Myers, The Ironton Fire Brick Co.

W. H. Peterson, Sr., Valentine Fire Brick Co.

George Puls, Acme Brick Co.

J. R. Rhodes, Gladding, McBean & Co.

G. T. Stowe, E. J. Lavino and Company.

A. M. Swank, Hiram Swank's Sons.

A. J. Tomasek, Walsh Refractories Corp.

W. T. Tredennick, Refractory Specialties Co.

W. A. Turner, H. K. Porter Company, Inc.

E. W. Valensi, North American Refractories Co.

H. F. West, Illinois Clay Products Co.

L. E. Whitesell, Wellsville Fire Brick Co.

#### ACCOUNTANTS' REPORT

We have examined the balance sheet of The Refractories Institute as of March 31, 1959, and the related statement of income and surplus for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying balance sheet and statement of income and surplus present fairly the financial position of The Refractories Institute at March 31, 1959, and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

MAIN AND COMPANY,

Certified Public Accountants.

April 17, 1959

Pittsburgh, Pa.

Schedule "A"  
THE REFRACTORIES INSTITUTE  
BALANCE SHEETS  
ASSETS

|                                         | March<br>31, 1959   | March<br>31, 1958   |
|-----------------------------------------|---------------------|---------------------|
| CASH IN BANK                            |                     |                     |
| Regular Account .....                   | \$ 5,752.85         | \$ 24,464.93        |
| Office Operating Account .....          | 258.49              | 500.00              |
| Savings Account .....                   | 20,738.04           | 20,229.16           |
|                                         | <u>\$ 26,749.38</u> | <u>\$ 45,194.09</u> |
| ACCOUNTS RECEIVABLE                     |                     |                     |
| Mellon Institute Fellowship Tests ..... | \$ 3,261.19         | \$ 3,827.24         |
| Manuals .....                           | 16.60               | 77.25               |
| Product Directory .....                 | 93.50               | 171.00              |
| Dues .....                              | 37.50               | .....               |
|                                         | <u>\$ 3,408.79</u>  | <u>\$ 4,075.49</u>  |
| PREPAYMENTS                             |                     |                     |
| Census Bureau Statistics .....          | \$ 1,875.00         | \$ 1,875.00         |
| Insurance .....                         | 159.53              | 296.27              |
|                                         | <u>\$ 2,034.53</u>  | <u>\$ 2,171.27</u>  |
| TOTAL ASSETS .....                      | <u>\$ 32,192.70</u> | <u>\$ 51,440.85</u> |

LIABILITIES AND SURPLUS

|                                    |                     |                     |
|------------------------------------|---------------------|---------------------|
| ACCOUNTS PAYABLE .....             | \$ 5,583.28         | \$ 6,201.43         |
| ACCRUED PAYROLL TAXES .....        | 688.25              | 618.73              |
| DUES PAID IN ADVANCE .....         | 150.00              | 150.00              |
| SURPLUS .....                      | 25,771.17           | 44,470.69           |
| TOTAL LIABILITIES AND SURPLUS .... | <u>\$ 32,192.70</u> | <u>\$ 51,440.85</u> |

Schedule "A", Exhibit I  
THE REFRACTORIES INSTITUTE  
STATEMENTS OF CASH RECEIPTS, DISBURSEMENTS,  
AND BALANCES

|                                                 | Years ended<br>March 31,<br>1959 | 1958                |
|-------------------------------------------------|----------------------------------|---------------------|
| CASH BALANCE, BEGINNING OF YEAR .....           | \$ 45,194.09                     | \$ 43,724.45        |
| Receipts:                                       |                                  |                     |
| Members' Dues .....                             | \$ 96,371.25                     | \$ 137,709.52       |
| Mellon Institute Fellowship Tests .....         | 45,812.07                        | 56,123.09           |
| Sale of Manuals .....                           | 635.02                           | 3,536.35            |
| Sale of Product Directory .....                 | 1,389.96                         | 1,675.26            |
| Interest Income .....                           | 508.88                           | 229.16              |
| Miscellaneous .....                             | 100.78                           | .....               |
| Factory Operators Committee Meetings .....      | .....                            | 1,530.00            |
| Joint Conference on Refractories Problems ..... | .....                            | 1,475.00            |
| TOTAL RECEIPTS .....                            | <u>\$144,817.96</u>              | <u>\$202,278.38</u> |
|                                                 | <u>\$190,012.05</u>              | <u>\$246,002.83</u> |
| Disbursements:                                  |                                  |                     |
| Salaries (net of taxes withheld) .....          | \$ 19,826.37                     | \$ 20,234.04        |
| Office Supplies and Expense .....               | 5,093.28                         | 5,623.72            |
| Mellon Institute Research .....                 | 33,589.04                        | 26,758.40           |
| Mellon Institute Fellowship .....               | 61,126.92                        | 57,808.85           |
| Auditing and Legal Fees .....                   | 6,546.50                         | 6,513.75            |
| Traveling Expense .....                         | 3,342.15                         | 2,764.66            |
| Meeting Expense .....                           | 8,296.75                         | 10,242.02           |
| Printing and Publishing .....                   | 4,602.53                         | 14,335.58           |
| Telephone and Telegraph .....                   | 700.10                           | 779.18              |
| Dues and Subscriptions .....                    | 721.94                           | 1,034.10            |

|                                                     |                     |                     |
|-----------------------------------------------------|---------------------|---------------------|
| Rent .....                                          | 2,260.80            | 2,260.80            |
| Insurance .....                                     | 13.52               | 423.18              |
| Payroll and Withholding Taxes .....                 | 6,037.34            | 5,547.09            |
| Study of Percentage Depletion .....                 | 2,449.14            | 2,660.39            |
| Pensions .....                                      | 5,735.03            | 5,735.03            |
| Furniture and Fixtures .....                        | 93.68               | 745.87              |
| Census Bureau Statistics .....                      | 2,500.00            | 2,500.00            |
| Honorarium .....                                    | 50.00               | .....               |
| Pennsylvania Sales Tax .....                        | 46.67               | 21.03               |
| Miscellaneous .....                                 | 30.91               | .....               |
| Refractories Bibliography .....                     | .....               | 18,000.00           |
| Career Brochure .....                               | .....               | 12,735.00           |
| American Society for Testing Materials Manual ..... | .....               | 4,086.05            |
| <b>TOTAL DISBURSEMENTS</b> .....                    | <b>\$163,262.67</b> | <b>\$200,808.74</b> |
| <b>CASH BALANCE, END OF YEAR</b> .....              | <b>\$ 26,749.38</b> | <b>\$ 45,194.09</b> |

Schedule "B"  
THE REFRACTORIES INSTITUTE  
STATEMENTS OF INCOME AND SURPLUS

|                                                     | Years ended<br>March 31, |                     |
|-----------------------------------------------------|--------------------------|---------------------|
|                                                     | 1959                     | 1958                |
| <b>Income:</b>                                      |                          |                     |
| Members' Dues .....                                 | \$ 96,408.75             | \$138,237.02        |
| Mellon Institute Fellowship Tests .....             | 45,246.02                | 54,538.93           |
| Sale of Manuals .....                               | 574.37                   | 3,524.60            |
| Sale of Product Directory .....                     | 1,312.46                 | 1,840.26            |
| Interest Income .....                               | 508.88                   | 229.16              |
| Miscellaneous .....                                 | 100.78                   | .....               |
| Factory Operators Committee Meetings .....          | .....                    | 1,530.00            |
| Joint Conference on Refractories Problems .....     | .....                    | 1,475.00            |
|                                                     | <b>\$144,151.26</b>      | <b>\$201,374.97</b> |
| <b>Expense:</b>                                     |                          |                     |
| Salaries .....                                      | \$ 25,500.04             | \$ 25,390.53        |
| Office Supplies and Expense .....                   | 5,108.88                 | 5,267.50            |
| Mellon Institute Research .....                     | 33,396.17                | 28,256.05           |
| Mellon Institute Fellowship .....                   | 62,350.82                | 56,953.41           |
| Auditing and Legal Fees .....                       | 6,546.40                 | 6,513.75            |
| Traveling Expense .....                             | 3,693.00                 | 2,764.66            |
| Meeting Expense .....                               | 6,499.94                 | 12,239.64           |
| Printing and Publishing .....                       | 4,602.53                 | 14,019.04           |
| Telephone and Telegraph .....                       | 704.91                   | 765.48              |
| Dues and Subscriptions .....                        | 729.44                   | 1,034.10            |
| Rent .....                                          | 2,260.80                 | 2,260.80            |
| Insurance .....                                     | 150.26                   | 126.91              |
| Payroll Taxes .....                                 | 433.19                   | 442.33              |
| Study of Percentage Depletion .....                 | 2,449.14                 | 2,660.39            |
| Pensions .....                                      | 5,735.03                 | 5,735.03            |
| Furniture and Fixtures .....                        | 93.68                    | 745.87              |
| Census Bureau Statistics .....                      | 2,500.00                 | 2,500.00            |
| Honorarium .....                                    | 50.00                    | .....               |
| Pennsylvania Sales Tax .....                        | 15.45                    | 55.78               |
| Miscellaneous .....                                 | 30.91                    | .....               |
| Refractories Bibliography .....                     | .....                    | 18,000.00           |
| Career Brochure .....                               | .....                    | 12,735.00           |
| American Society for Testing Materials Manual ..... | .....                    | 4,086.05            |
|                                                     | <b>\$162,850.78</b>      | <b>\$202,552.32</b> |
| <b>EXCESS OF EXPENSE OVER INCOME</b> ..             | <b>\$ 18,699.52</b>      | <b>\$ 1,177.35</b>  |
| Surplus at Beginning of Year .....                  | 44,470.69                | 45,648.04           |
| <b>SURPLUS AT END OF YEAR</b> .....                 | <b>\$ 25,771.17</b>      | <b>\$ 44,470.69</b> |

## REPORT OF THE TREASURER

Operations of the eighth fiscal year of The Refractories Institute ended March 31, 1959, as condensed in this report show that The Institute had a cash balance, including savings of \$26,749.38.

|                                                | Fiscal Year's Ended March 31, |                     |
|------------------------------------------------|-------------------------------|---------------------|
|                                                | 1959                          | 1958                |
| <b>Receipts:</b>                               |                               |                     |
| Cash on hand start fiscal year (April 1) ..... | \$ 45,194.09                  | \$ 43,724.45        |
| Dues .....                                     | 96,371.25                     | 137,709.52          |
| Mellon Institute Tests .....                   | 45,812.07                     | 56,123.09           |
| Interest Income .....                          | 508.88                        | 229.16              |
| Miscellaneous .....                            | 2,125.76                      | 8,216.61            |
| <b>TOTAL RECEIPTS .....</b>                    | <b>\$190,012.05</b>           | <b>\$246,002.83</b> |
| <b>Disbursements:</b>                          |                               |                     |
| Audit and Legal .....                          | \$ 6,546.50                   | \$ 6,513.75         |
| Dues and Subscriptions .....                   | 721.94                        | 1,034.10            |
| Furniture and Fixtures .....                   | 93.68                         | 745.87              |
| Meeting Expense .....                          | 8,296.75                      | 10,242.02           |
| Office Expense .....                           | 5,093.28                      | 5,623.72            |
| Percentage Depletion .....                     | 2,449.14                      | 2,660.39            |
| Printing and Publishing .....                  | 4,602.53                      | 14,335.58           |
| Pension Premiums (Newton and Phelps) .....     | 5,735.03                      | 5,735.03            |
| Rent .....                                     | 2,260.80                      | 2,260.80            |
| Salaries, Net .....                            | 19,826.37                     | 20,234.04           |
| Travel .....                                   | 3,542.15                      | 2,764.66            |
| Telephone and Telegraph .....                  | 700.10                        | 779.18              |
| Taxes and Insurance .....                      | 6,097.53                      | 5,991.30            |
| Miscellaneous .....                            | 80.91                         | .....               |
| Census .....                                   | 2,500.00                      | 2,500.00            |
| Mellon Institute Tests .....                   | 61,126.92                     | 57,808.85           |
| Mellon Institute Research .....                | 33,589.04                     | 26,758.40           |
| Purchase of A.S.T.M. Manuals .....             | .....                         | 4,086.05            |
| Career Brochure .....                          | .....                         | 12,735.00           |
| Refractories Bibliography .....                | .....                         | 18,000.00           |
| <b>TOTAL DISBURSEMENTS .....</b>               | <b>\$163,262.67</b>           | <b>\$200,808.74</b> |
| <b>CASH BALANCE MARCH 31 .....</b>             | <b>\$ 26,749.38</b>           | <b>\$ 45,194.09</b> |

The cost of operating the Fellowship at Mellon increased substantially last year due, in large part, to the increase in the service charge made by Mellon Institute for all Fellowships. To provide the necessary funds for this and additional expenses in connection with percentage depletion, the Board of Directors authorized an increase in dues effective April 1, 1959.

Respectfully submitted,

F. H. LAUBE, Treasurer

# BUDGET

April 1, 1959-March 31, 1960

## Income:

|                              |              |
|------------------------------|--------------|
| Dues .....                   | \$123,984.00 |
| Mellon Institute Tests ..... | 48,000.00    |
| Miscellaneous .....          | 2,500.00     |

|             |              |
|-------------|--------------|
| TOTAL ..... | \$174,484.00 |
|-------------|--------------|

## Expense:

|                                 |           |
|---------------------------------|-----------|
| Audit .....                     | \$ 550.00 |
| Census Bureau .....             | 2,500.00  |
| Dues and Subscriptions .....    | 750.00    |
| Legal .....                     | 7,200.00  |
| Meeting .....                   | 8,300.00  |
| Mellon Institute Tests .....    | 62,000.00 |
| Mellon Institute Research ..... | 33,600.00 |
| M. I. Pension—Phelps .....      | 3,509.00  |
| Office Expense .....            | 5,100.00  |
| Pension—Newton .....            | 2,226.00  |
| Percentage Depletion .....      | 17,000.00 |
| Printing and Publishing .....   | 3,500.00  |
| Rent .....                      | 2,347.00  |
| Salaries, Gross .....           | 24,800.00 |
| Taxes and Insurance .....       | 600.00    |
| Telephone and Telegraph .....   | 700.00    |
| Travel .....                    | 3,000.00  |
| Miscellaneous .....             | 400.00    |

|             |              |
|-------------|--------------|
| TOTAL ..... | \$178,082.00 |
|-------------|--------------|

|                                  |             |
|----------------------------------|-------------|
| Deficit, Draw from Surplus ..... | \$ 3,598.00 |
|----------------------------------|-------------|

# ATTENDANCE LIST

## 1959 Spring Membership Meeting

### ACTIVE MEMBERS

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| <p>Acme Brick Co.<br/>Mr. and Mrs. Geo. Puls</p> <p>Aetna Fire Brick Co.<br/>Mr. and Mrs. L. F. Sims<br/>Mr. and Mrs. K. Whitlatch</p> <p>The Babcock &amp; Wilcox Co.<br/>Mr. and Mrs. J. E. Brinkerhoff<br/>Mr. and Mrs. C. L. Norton<br/>Mr. and Mrs. M. J. Terman</p> <p>The Carborundum Company<br/>Mr. and Mrs. R. A. Barr</p> <p>Cedar Heights Clay Co.<br/>Mr. and Mrs. M. E. Morgan</p> <p>Chicago Fire Brick Co.<br/>Mr. and Mrs. W. G. Young</p> <p>The Cordol Corp.<br/>Mr. and Mrs. C. L. Corson</p> <p>The Crescent Brick Co.<br/>Mr. and Mrs. D. R. Ferguson</p> <p>The Davis Fire Brick Co.<br/>Mr. and Mrs. E. E. Davis<br/>Mr. and Mrs. J. L. Cummings</p> <p>The Denver Fire Clay Co.<br/>Mr. and Mrs. R. C. Shepard</p> <p>Garfield Refractories Co.<br/>Mr. and Mrs. K. A. Rugh</p> <p>Gem Clay Forming Inc.<br/>Mr. and Mrs. J. Harrison Keller<br/>Mr. and Mrs. Evan W. Morris</p> <p>General Refractories Co.<br/>Mr. and Mrs. L. Y. Greene<br/>Mr. and Mrs. H. F. Greene<br/>Mr. and Mrs. R. E. Longacre<br/>Mr. and Mrs. D. M. Thorpe<br/>Mr. L. J. Trostel</p> | <p>Gladding, McBean &amp; Co.<br/>Mr. and Mrs. J. R. Rhodes</p> <p>The Globe Brick Co.<br/>Mr. and Mrs. W. A. Porter<br/>Mr. and Mrs. W. P. Porter</p> <p>A. P. Green Fire Brick Co.<br/>Mr. and Mrs. W. S. Lowe<br/>Mr. and Mrs. A. R. Barnett</p> <p>Harbison-Walker Refractories Co.<br/>Mr. and Mrs. F. H. Atwood<br/>Mr. and Mrs. C. A. Brashares<br/>Mr. and Mrs. E. T. Hile</p> <p>Illinois Clay Products Co.<br/>Mr. and Mrs. H. F. West</p> <p>The Ironton Fire Brick Co.<br/>Mr. and Mrs. J. H. Rickey, Jr.</p> <p>Johns-Manville Sales Corp.<br/>Mr. N. J. Kent</p> <p>Kyanite Mining Corp.<br/>Mr. and Mrs. Gene Dixon<br/>Mr. and Mrs. C. B. Kay</p> <p>E. J. Lavino and Company<br/>Mr. and Mrs. G. T. Stowe</p> <p>McCrary Refractories, Inc.<br/>Mr. and Mrs. Levi C. McCrary<br/>Mr. and Mrs. C. E. Weinkauf</p> <p>Mexico Refractories Co.<br/>Mr. and Mrs. J. B. Arthur<br/>Mr. and Mrs. W. B. Leach<br/>Mr. and Mrs. E. C. Tinsley</p> <p>National Refractories Div.<br/>Mr. R. A. Hitchins</p> <p>New Castle Refractories Co.<br/>Mr. and Mrs. R. W. Rowland<br/>Mr. and Mrs. J. W. Miller</p> | <p>North American Refractories Co.<br/>Mr. and Mrs. E. W. Valensi<br/>Mr. and Mrs. H. H. Hopwood</p> <p>Oak Hill Fire Brick Co.<br/>Mr. and Mrs. M. E. Davis</p> <p>H. K. Porter Company, Inc.<br/>Mr. W. A. Turner<br/>Mr. and Mrs. J. P. Raugh</p> <p>The Ramtite Co.*<br/>Mr. and Mrs. T. Kauffman</p> <p>Refractory &amp; Insulation Corp.<br/>Mr. Frank Christenson</p> <p>Refractory Specialties Co.<br/>Mr. and Mrs. W. T. Tredennick<br/>Mr. L. Ray Brant</p> <p>H. C. Spinks Clay Co.<br/>Mr. and Mrs. H. S. Carothers</p> <p>Hiram Swank's Sons<br/>Mr. A. M. Swank<br/>Mr. G. J. Geiser<br/>Mr. C. A. Young<br/>Dr. Harold Kohl</p> <p>The Chas. Taylor Sons Co.<br/>Mr. and Mrs. R. W. Knauff<br/>Mr. and Mrs. J. Murray Johnston<br/>Mr. and Mrs. A. Maupin<br/>Mr. and Mrs. H. C. Wildner</p> <p>Valentine Fire Brick Co.<br/>Mr. and Mrs. W. H. Peterson, Jr.</p> <p>Walsh Refractories Corp.<br/>Mr. A. J. Tomasek<br/>Mr. and Mrs. J. J. Duggan<br/>Mr. and Mrs. W. K. Schweickhardt</p> <p>Wellsville Fire Brick Co.<br/>Mr. and Mrs. L. E. Whitesell</p> |
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