International Lead Conference

ARNHEM, HOLLAND—OCT. 4-7, 1965

lead

LEAD INDUSTRIES ASSOCIATION, INC.

292 MADISON AVENUE, NEW YORK, N.Y. 10017

N 1156

WHAT'S HAPPENING IN THE WORLD OF LEAD

The Second International Conference On Lead, October 4-7, in Arnhem, Holland, will report up-to-the-minute developments in cable sheathing, batteries, and other uses.

The Second International Conference on Lead will be held at the Hotel Haarhuis, Arnhem, Holland from October 4 to 7 this year. Organized by the Lead Development Association in London, it will bring together top authorities in several fields of lead use from countries throughout the free world. In addition to technical papers (simultaneously translated *a la* United Nations) the conference has scheduled several discussion sessions and trips to nearby industrial sites where lead is consumed.

Beginning on the second day of the conference, separate technical sessions dealing with batteries, cable sheathing, and general uses will be run concurrently.

The cables group will hold technical sessions on the 5th and 7th to look at recent developments in dispersioned strengthened lead sheathing, continuous extrusion, international standardization, and recent research developments. On the intervening day, visits to five cable manufacturing plants have been arranged. Detailed papers on fatigue testing, thermal movement, transport fatigue, and several continuous extrusion methods will complete the program.

The batteries group is to hold one session on battery uses in vehicles—automotive and truck batteries, railroad uses, and industrial vehicles—and another session on technology and manufacturing. The latter will include papers on large scale production, quality control, and various special lead acid batteries. The final day of the conference has been set aside for tours of local German and Dutch battery plants by this group.

General lead uses, covered by the remaining concurrent sessions, will be highlighted by papers on corrosion control with lead, sound and vibration control applications, the new continuous casting technique for lead sheet, and summaries of current research and development work, especially that dealing with organolead compounds now being evaluated for a wide variety of uses from marine anti-fouling agents to chemical catalysts and stabilizers for plastics.

The conference is sponsored by the European Lead Development Committee. Copies of papers can be had by contacting the Lead Development Association, 34 Berkeley Square, London W1, England, which is acting as Secretariat.

HO

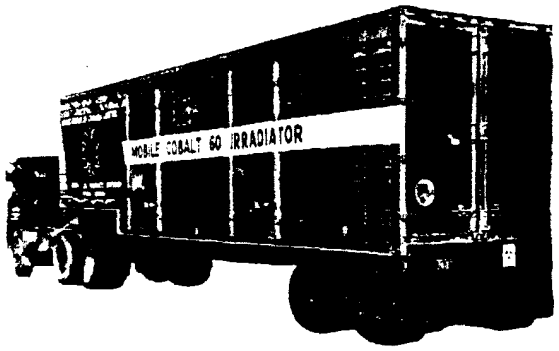
"Those scientists can do abo
thing" was the reported comm
an "oldtimer" in rural Ontario
watched buckets of onions
out of a truck trailer as potatoe
loaded into it.

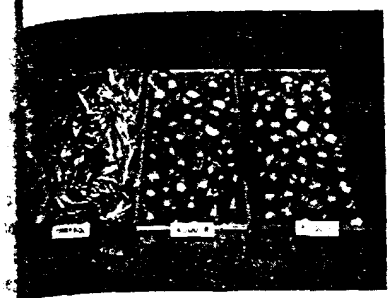
Of course, there was more
than met his eye. The trailer
the mobile vegetable irradiator
and operated by the Comm
Products Div., Atomic Ener
Canada, Ltd., Ottawa. Vege
such as those potatoes and onio
conveyed by the bucketload in
lead shielded irradiator where
are exposed on all sides to gamm
diation from a cobalt-60 source
treatment, at an 8000-rad level,
tively stops sprouting and great
duces spoilage during storage at

Assembling the main radiation shield o
trailer. The shield contains about 3.25
of lead.

LIA26413

POTATOES





...reated and treated onions show effect of ...iation on sprouting in storage. Left to ...ht: Zero, 4000, and 8000 R.

...eratures up to 70 F. What the old-...mer saw was merely a switchover ...om irradiating onions to irradiating ...tatoes.

The AECL irradiator mounted in a ...andard 8- by 12- by 34-ft. trailer ...s been operating in Canada and the ...nited States for the last 4 years pro-...ing potatoes and other vegetables ...the rate of 2500 lb. per hr. The ir-...diator is one of the first to be in op-...ation. Authorities generally agree ...at the mass irradiation of meats ...particularly freshly caught fish) and ...getables is rapidly approaching the ...oduction stage.

The mobile irradiator consists of ...ree main sections:

- the conveyor system that moves ...e vegetables past the source;
- the radioactive source itself;
- the lead shielding that makes ...e unit completely safe.

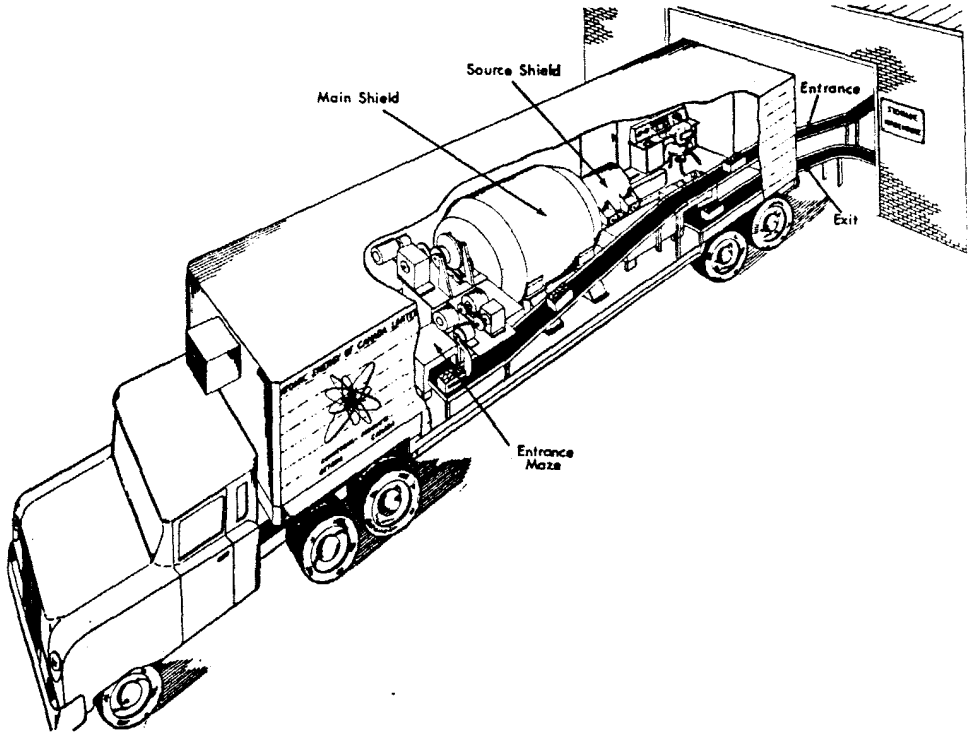
How it works

In operation, potatoes are conveyed ...to the trailer in buckets that are ...by 8- by 15-in. The power conveyor ...elts do not go directly to the irradia-...or but make a number of right angle turns to block any potential radiation leak path.

When a bucket gets into the lead shielded irradiation chamber, it is inserted into a vertical conveyor and carried upright completely around the radiation source in a Ferris wheel like motion. This motion is intermittent so that each bucket remains for a predetermined period in each of eight positions around the source; the eight positions are made up of two four position rotations.

The 30,000-curie source is a cobalt-60 rod 15 in. long, sealed in a twin wall stainless steel capsule. During travel or maintenance work on the irradiator the source is retracted into a lead container that has walls 12-in. thick. About 6,700 lb. of lead is used in the safe storage container.

The shield around the irradiation chamber and the conveyor is also lead. Those walls are 10-in. thick. In all, approximately 6,500 lb. of lead shielding was used in the main shield assembly that is 30-in. long and 40-in. in diameter.



LIA26414

Have you ever wondered?

WHAT DOES TETRAETHYL LEAD DO?

Tetraethyl lead was once the hallmark of a premium gasoline. Today, 98 out of every 100 gallons—regular as well as premium—contain TEL or one of many mixtures of TEL and its chemical cousin TML (tetramethyl lead).

For your engine

Modern gasolines contain at least three and sometimes as many as six or seven additives. These combat spark plug fouling and preignition, carburetor icing and deposits, protect against corrosion, and help overcome operating and maintenance problems. TEL and TML have a specific job: they increase octane rating, or the gasoline's ability to produce power without knocking.

By protecting the engine against harmful knock, TEL allows it to get more useful work out of every gallon. Without the TEL in modern gasoline, the octane rating would be that common many years ago, and performance and efficiency of your engine would suffer.

For you

If you were forced to use gasoline with an octane rating that prevailed about ten years ago, for example, it would take eleven gallons of it to do what you can do today with ten gallons. This sort of difference in performance corresponds to the effect of the TEL in today's gasoline. Put another way, TEL saves the American motorists about $2 billion a year in gasoline costs.

For the oil refiner

The oil refiner adds a small amount of antiknock fluid—only about one teaspoon per gallon of gasoline. This addition, in combination with the processing given the gasoline stock, sets the octane rating of the finished fuel. If processing alone were used to achieve the same quality, the severity of the processing required would substantially decrease the gasoline yield per barrel of petroleum. With these antiknock compounds readily available, refiners can produce both premium and regular grades of gasoline simply and economically. And they can maintain the octane rating of these grades day in and day out.

Moreover, by attaining the desired octane rating in this way, refiners need not make the large capital outlays otherwise required for additional octane improvement facilities.

For people everywhere

Currently, the use of antiknock compounds is saving almost 200 million barrels of oil a year in the United States alone and millions more in other countries throughout the world. Over the past 25 years, these additives have saved an estimated 5 billion barrels of petroleum worth $15 billion at current prices. But beyond conserving these irreplaceable natural resources, antiknock compounds help achieve efficiency and economy for all motor vehicles. This includes not just the cars we drive but the buses and trucks that serve us.

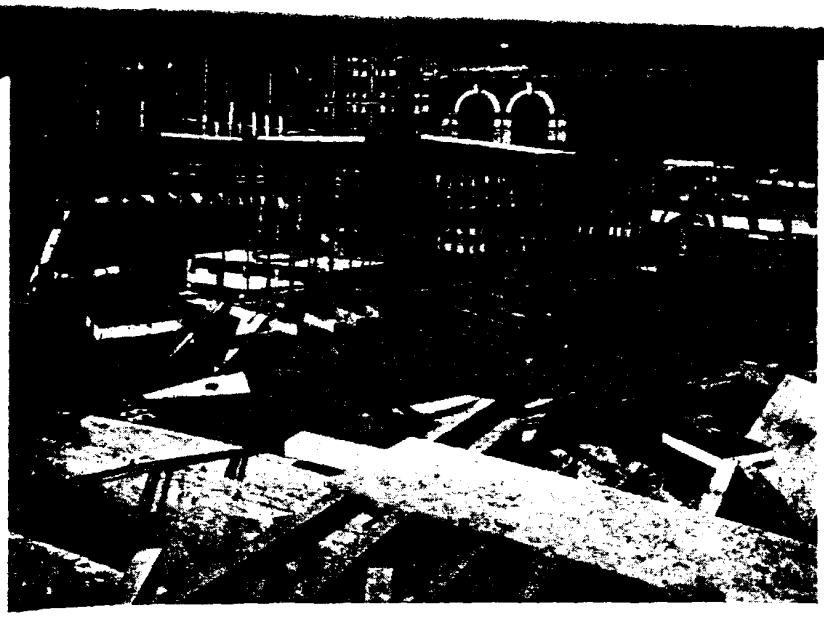
Increasing world need for TEL and TML, once produced only in the United States, has led to other facilities to produce these materials in England, France, Canada, Mexico, Greece, and plans for plants in Germany and Japan.

ANTIKNOCK COMPOUNDS AND PUBLIC HEALTH

For the more than 40 years that antiknock compounds have been in use, they have been subjected to continuing thorough research from a public health standpoint. Most of this research has been sponsored by the antiknock compound industry. The research has shown that:

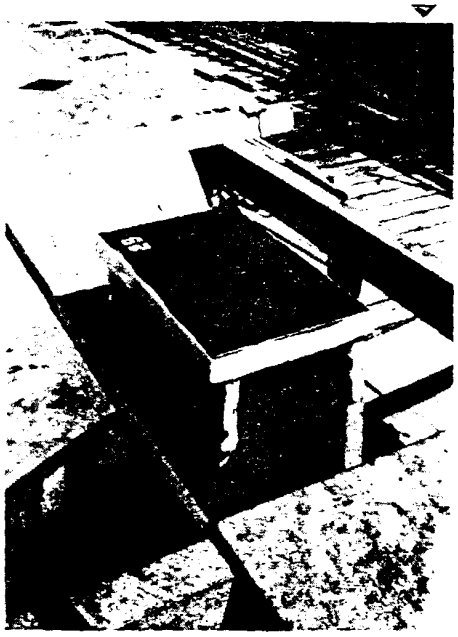
1. Antiknock compounds do not contribute to smog formation.
2. Lead compounds discharged into the atmosphere in automobile exhaust have not created a hazard to the health of the public.
3. Concentrations of lead from all sources (including antiknock compounds) in the air of American cities is low.
4. The amounts of lead to which the general public is exposed—from all sources, including foods and beverages—are far below hazardous limits.
5. During the last 20 or more years, there has been little change, in the intake, output or retained amount of lead in the body of the average adult American.

Just this spring, the U. S. Public Health Service published the results of a comprehensive survey of lead in the atmosphere in three major cities—Los Angeles, Philadelphia, and Cincinnati. These results confirmed earlier findings that atmospheric lead levels are low and present no public health hazards.



General view of the construction at Sloan Square. Pads (arrows) are in place on the column caps.

Close-up of the pad in place shows the resilient surround which will hold poured concrete away from the column and prevent creation of any by-pass path for vibration.



LEAD PADS FOR SLOAN SQUARE

At Sloan Square in London a new office and apartment building is being completed over one of the local electric railway lines. Though basically a surface electric railway, the line makes frequent dips under major highways and buildings. The new station building is, therefore, not particularly unusual for being located over the trackage.

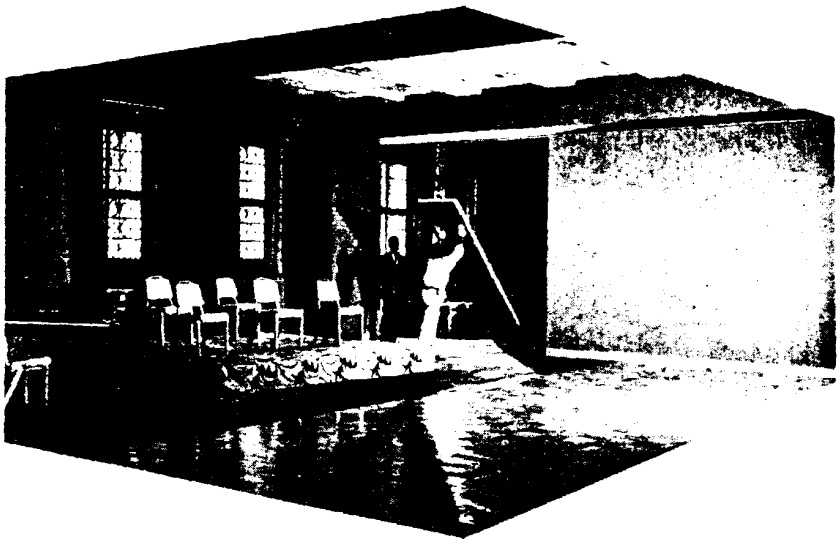
But it does represent a new development in vibration isolation in the United Kingdom because it will rest on 29 lead-asbestos anti-vibration pads to isolate it from any train-induced vibration in the ground.

The pads themselves are relatively small—the largest 29″ x 28″—since they rest atop the columns over the track sections. The highest static loading on the pads will be 760 psi.

Two of the techniques used at Sloan Square are noteworthy: The pads were held in place during construction by cementing them to the caps of the columns with an adhesive. Once the pads are under load, of course, the adhesive will have no effect, but it does maintain alignment during the work without introducing any by-pass path for vibration at a later stage. The other point worth noting is the resilient material used to surround the pad installation before any concrete is poured. This also prevents the creation of a by-pass.

Quiet Exhibition in Paris

The Radio and TV Exhibition held two years ago in Paris was, like most exhibits and trade shows, well attended by interested spectators. And like most exhibits and trade shows, it was partitioned with light, temporary wood-and-hardboard walls. This could have resulted in a severe problem—the difficulty in hearing superbly recorded and reproduced music over the background of the crowd's conversation. The quick, convenient, and technically adequate remedy for the situation was sheet lead 1 millimeter thick (approximately 2½ lb.) used to bolster the sound-stopping power of the partitions.



FOUR ROO
IN HALF A

THERE'S a lot more to running a first-class hotel than providing bed and board. Meetings and group functions require private meeting rooms where a quiet committee of twelve or a boisterous convention of a thousand may conduct the business at hand. The famous Sheraton-Chicago, host to about 1500 such group affairs each year, serves organizations whose programs may call for a general meeting of more than a thousand people followed by 24 simultaneous committee programs—each in its own room.

If a hotel contained all the banquet halls, ballrooms, parlors, and meeting rooms needed to meet this sort of requirement, and if each of these facilities were maintained as a single-purpose room, there wouldn't be much space left for guest rooms. The Sheraton-Chicago has found a system of removable walls which convert its large halls into the smaller units with excellent privacy and with such tasteful, unobtrusive decor that it is hard to tell which wall is permanent and which can be removed or replaced in a matter of minutes.

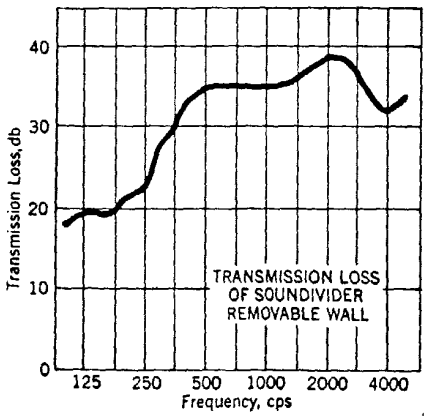
For example, the East Room at the Sheraton, about 75 x 75 feet, can be split up into two, three, or four rooms by these walls. If the maximum four rooms are required, the record time is just 18 minutes. When finished, only close scrutiny reveals which walls were installed and which are permanent. And the acoustical privacy has been adequate for every function to date.

The remarkable wall system that makes this possible is a hollow wooden panel system which uses one-pound sheet lead as an internal sound barrier in conjunction with internal sound absorptive material and a system of seals and locks. Developed by Kilgore Removable Walls, Ltd. of Toronto, it is manufactured and sold by the Pennsylvania Pacific Corporation of Warminster, Pa., under the name Soundivider (trade mark).

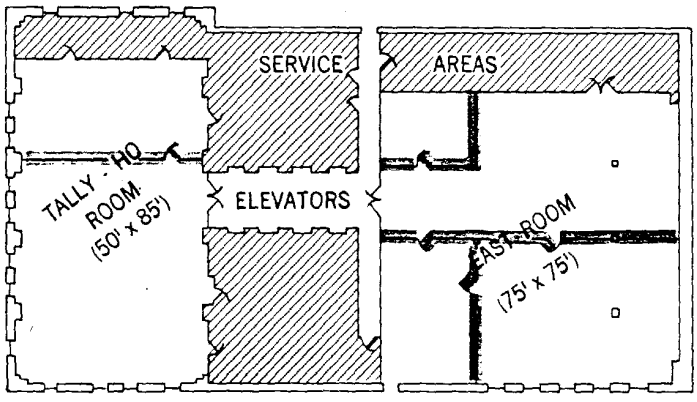
If there is a secret ingredient i wall it is *simplicity*. No gearm or conveyor chains are require cause the two-foot wide panels only about four pounds per sq foot. Two men easily and qu carry and emplace the typical ten high (80 lb.) panels. There are pneumatic or hydraulic seals to erate (and repair) because each is built to fit its particular spot three sides of the panel fit ton and-groove against soft rubber foam gaskets. The foot of each p is sealed by a gasket and a facin carpeting which also protects fl from scuffing. To bring the seals tight and make joints all but inv ble, each panel is locked to the n by a concealed cam-locking faste as the wall is being put up. Only battering ram could move it, o locked.

Recent tests (see plot) at t Riverbank Acoustical Laborato show that the Soundivider has a ni

Riverbank test data for Penn Pac's Soundivider.



The Soundivider will slice 25 feet off the 85 foot long Tally-Ho Room (shown above) without spoiling the handsome decor of either portion. The removable wall is indicated in green in the floorplan.



Close-up of the wall
edges. Normally, two
visor is locking two of

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for ONE HOUR

t i… quency average of 30 db and a r… und transmission class of 35.
re… The proverbial one-armed paper-… nger is no busier than the conven-
s… n services department of the Shera-
qu… n-Chicago when a big meeting is in
ten… ogress. When the new removable
are… ll system was being installed, there
to… s understandable apprehension
h… out the convenience and workabil-
ot… of the new system. But when two
on… the hotel's carpenters finished in-
er… alling all the channels — it took
t… em about three working days,
in… read over the two-week installation
flo… eriod, all without tying up the
als… ooms when needed—and the walls
inv… d their first trial, worried looks
e … anged to smiles. The 155 feet of
ste… all in the East Room can be erected
nly… taken down and stored by two
on… ousemen in less than half an hour.
… the 116 feet in the Exhibition Hall
ato… nd 48 feet in the Tally-Ho Room go
ni… en faster.

…all installation shows the tongue-and-groove …dle the whole job. Here, their super-… ols already installed.

A view of the 42' wall of the mezzanine drafting room. This wall faces the main workshop area.

One corner of the completed room.

WASTE SPACE + LEAD = QUIET DRAFTING ROOM

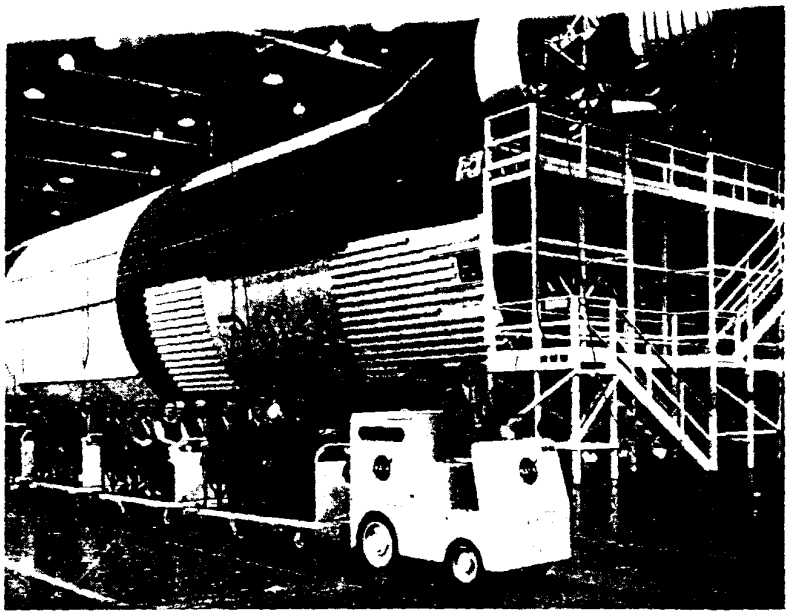
Sheet metal work in making washing machines is no quieter down under in Australia than it is anywhere else in the world. But John W. Stamp Proprietary, Ltd., of Carlton, Australia has salvaged some wasted plant space amid such an operation and built a quiet, modern drafting room.

It all started when the company decided to locate the drafting room over workshop operations which required only eight feet of the available 24 foot headroom. A mezzanine floor of 42 x 17 feet was built of steel joists, wood, building felt and linoleum. Walls were erected right up to the sawtooth roof, varying from 9 to 15 feet. These were framed with 4" wood studs and covered on the outside with 5/16" Masonite. The interior finish was 1/2" fiberboard.

It must be said that the results were not very satisfactory from a noise point of view. The light walls and the many sound leakage paths resulted in frayed nerves, misunderstood telephone conversations, and errors.

Called on to examine the problem, the Royal Melbourne Institute of Technology suggested the use of sheet lead as a sound barrier. The design for the barrier, as it was finally erected, was 3/16" plywood, and 1/4" polyurethane foam, and 2-pound lead, all bonded together with adhesive. This lead panelling was screwed to the Masonite exterior in 6'x3' sections with wood battens over each joint. To further seal these joints, the lead was allowed to overlap by 1" all around. At the same time, attention was given to sealing up all the openings for piping, wiring, air conditioning ducts and other obvious leaks.

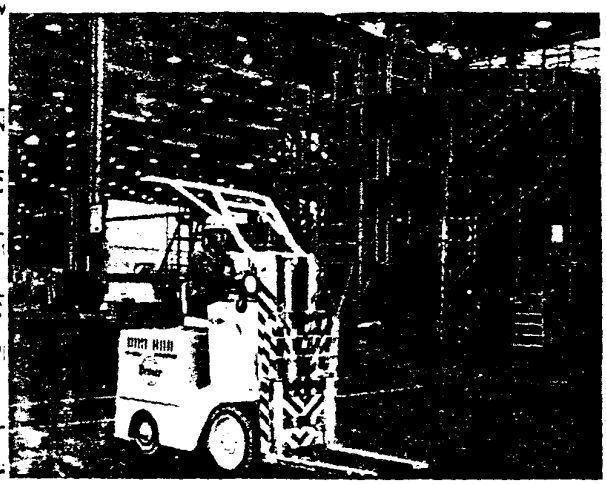
Not only are the draftsmen pleased with their new quarters, but the management of the company liked it so well that they have allowed it to be examined by anyone facing similar problems as an example of what can be done. It is true that occasional noise from a pneumatic hammer or press can be heard in the drafting room, but these are not generally troublesome. One of the incidental expenses of the conversion says more about its effectiveness: An additional loudspeaker had to be added to the plant paging system because the draftsmen could no longer hear the speaker outside the drafting room and needed one of their own.



Visitors to NASA's Michoud Assembly Facility ride comfortably on tour train as guide describes scene in normal tone of voice. Train is towed by quiet, smooth battery power.

Boeing Builds a Booste

Mason-Rust's immaculate, white ambulance, equipped for emergency aid (above) and a battery fork lift truck on its way for a load of vital parts.



Amid all the exotic complexity of space technology the mundane lead-acid battery, perhaps somewhat unexpectedly, has found a strategic position. A case in point is at the National Aeronautics and Space Administration's Michoud Assembly Facility in New Orleans. Here the rocket booster to be used to start the manned Apollo spacecraft on its long journey to the moon is under construction by the Boeing Company.

The huge rocket, being developed as the first stage of the Saturn V under a contract with NASA, is called the S-IC. It is the largest rocket stage under development in the United States.

The S-IC is 138 feet in length and 33 feet in diameter. Five Rocketdyne F-1 engines will generate 7,500,000 pounds of thrust to lift the 364 foot, 6,034,000 pound Saturn V/Apollo off the launch pad at Cape Kennedy.

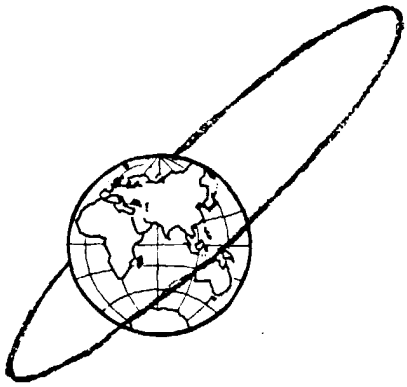
Burning liquid oxygen and kerosene, the S-IC will propel the three-stage vehicle and manned spacecraft on the journey to the moon during the first two and a half minutes of flight. Then, as the first stage drops away, North American's S-II second stage takes over for about 6½ minutes. At second stage separation, the Douglas S-IV-B third stage and attached spacecraft will go into an inclined earth orbit and circle in a parked orbit while all systems checked out. Then, with all "go," the third stage is jettison ter placing the Apollo spacecra lunar trajectory at an escape v of approximately 25,000 mph.

About three days after l Earth, two of the astronauts w scend from the spacecraft t moon's surface in the Lunar E sion Module, while the other naut continues to orbit the mo the Command Module. Depe upon conditions, the two men o moon could remain there up week, before rendezvousing with third man in the Apollo Comm Module and starting back to E some 250,000 miles away.

That is the plan for the Ap moon mission scheduled for this ade, and the important role tha Launch Systems Branch of Boei playing at NASA's Michoud As bly Facility in New Orleans.

But where, in this dramatic set would one expect to find the pro lead-acid battery at work? Certa the word "battery" is not new space, but let's take a closer look at Michoud.

For one vital function, the alm surgically clean environment manded in space development construction requires battery p ered sweepers to constantly patrol



and Batteries are Busy

acres of especially treated glistening floors, seeking out dust and dirt.

Then, too, distances in the huge assembly areas have forced supervisors to take to wheels and expediting is smoother and more efficient, thanks to battery vehicles.

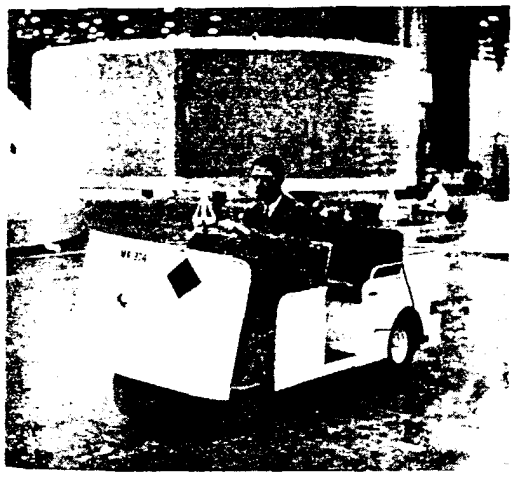
The dependable fork lift, workhorse of the fleet, is equally essential in moving vital parts from receiving the stock and from stock to assembly. Reliability and versatility are the major desirable traits of the battery fork lifts so important at Boeing.

Among the specialized vehicles is the immaculate, white, battery powered ambulance operated for NASA by the support services contractor at Michoud, Mason-Rust. Especially equipped for handling emergencies, the dependable vehicle can be operated easily and effortlessly by the trained medical personnel to arrive quickly on the scene to render aid.

Finally, keen public interest in all things in "space" brings many visitors to Michoud, and the smooth, quiet way to tell them the story is on board NASA's silent, battery powered tour train.

And so the unorthodox and the *commonplace find themselves* side-by-side, each complementing and necessary to the other.

Who knows? The lead-acid battery, a century-old sensation, may yet find itself on the moon—certainly beyond any dream of inventor Gaston Plante!



▲ A mobile supervisor gets to distant points quickly and conveniently in a battery powered personnel vehicle.

A battery powered vacuum cleaner on the prowl for dust and dirt. ▶

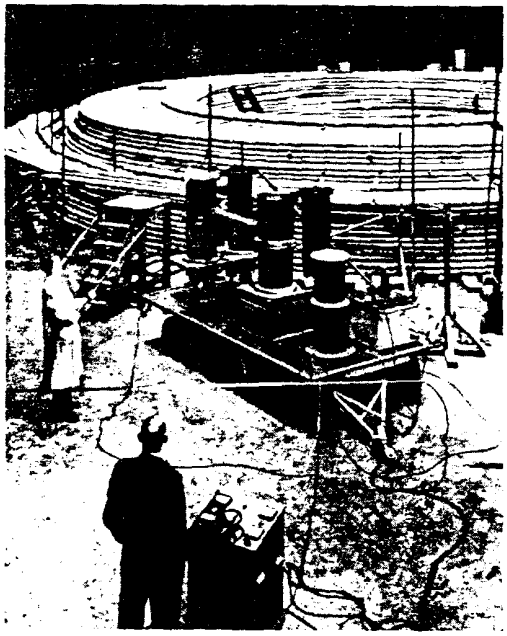
LIA26420

DEEP SEA DC

Transmission of sizeable amounts of electric power by submarine cable at high voltage (DC) has become increasingly important in recent years. Six such cables are now in service or under construction. All of them use lead-sheathed, paper-insulated cables. Solid, oil-filled and gas-filled type cables are used.

High voltage direct current transmission has two principal advantages over alternating current transmission: 1) smaller thicknesses of insulation can be used for the same value of peak voltage, 2) as there are no sheath or armor currents there are no sheath losses in energy. Consequently cables for DC are smaller and cheaper than cables for the same amount of AC.

Here is a brief summary of the chief characteristics of the six new cables:*



Each 15-mile coil of cable for the English Channel cable was tested at 200 kv before use.

Sweden-Gotland

62 miles: single cable, sea water return; 100 kv to ground; power transfer capacity 20 Mw; solid-type cable; conductor cross-section 90 mm².

No faults due to electrical failures on cable. Four faults caused by ships' anchors.

Cross-Channel, England-France

32 miles: two cables "go" and "return"; spaced 10 ft. apart to prevent magnetic effects on ships' compasses, in world's busiest shipping lane; ± 100 kv to ground; power transfer capacity 160 Mw; solid-type paper insulation; conductor cross-section (undersea portion) 340 mm².

No faults due to electrical failures, but both cables damaged in January 1962 by ship's anchor. No power cable faults to date.

Sardinia-Corsica-Italy (to be commissioned in 1965)

Sardinia-Corsica 5 miles; then overhead line section; then Corsica-Italy 56 miles. Two cables, both of same polarity; sea water return; 200 kv to ground; power transfer capacity 200 Mw; solid-type paper insulation; conductor cross-section 420 mm².

New Zealand: North Island-South Island Link (Cook Strait). (To be commissioned in 1965).

25.47 miles: three cables, one spare; ± 250 Kv, using "go" and "return" cables, power transfer capacity 600 Mw; gas filled-type cable; conductor cross-section (undersea portion) 520 mm². Laid and tested. Said to be longest, heaviest (1500 tons each) to be made.

Konti-Skan Link, Sweden-Denmark-West Germany (To be commissioned in 1965)

Sweden-Laesoe: solid type cable. Conductor cross-section (undersea portion) 625 mm². Made in lengths of about 6,500 yd, and factory jointed with flexible joints.

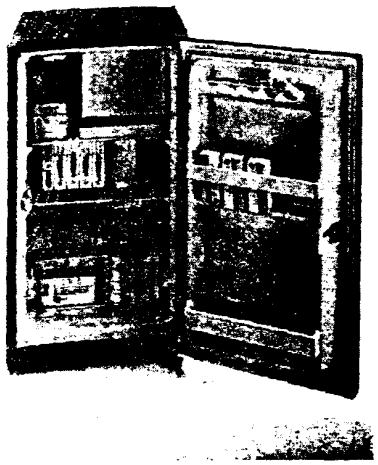
Laesoe-Jutland: oil-filled type cable; two insulated conductors in a single flattened oval sheath with corrugated steel tapes acting as compensating devices; conductor cross-section 2 x 310 mm². Made in lengths of about 984 yd, and spliced at sea.

*From "Solid, Paper Insulated Pipe-Type Cable for HVDC" by J. H. M. Sykes, (Overseas Editor) ELECTRICAL WORLD, June 15, 1964.

Interesting Odds 'N' Ends about Lead

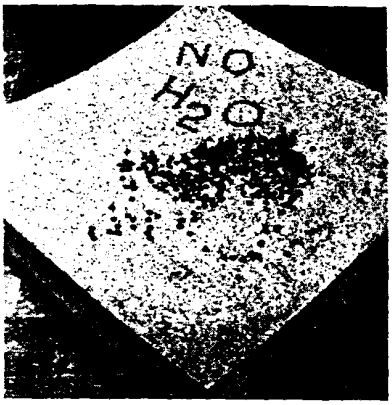
MIL Spec SPQR-VII? — According to Gordon Gaskill, writing in the June *Readers' Digest*, the ancient Romans had learned how to defeat electrolysis in the submerged parts of their ships. They lead coated copper nails to prevent any reaction between the copper and the lead sheathing they used to protect the wooden hulls from marine worms.

It keeps hot samples cold! Not much different in appearance from an ordinary refrigerator, this small unit



for radioactively tagged materials is shielded with lead. If hot and cold pharmaceuticals are your dish, you may want to contact Reo Scientific Corp., Williston Pk., L.I., N.Y.

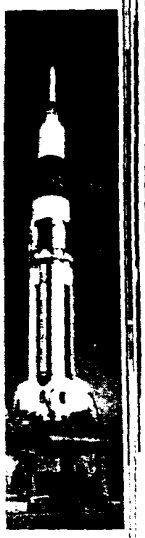
They cut off our water! Faithful readers of LEAD will recall a 1961 issue describing the building of this fountain and pool at American Airlines



terminal in New York. The effect of the local drought is spelled out in the coins the fountain collected.

Plumbers' soil is a compound which could be called an anti-flux—it prevents solder from tinning parts of the job that must remain solder-free. LIA's plumbing consultant, Homer Yetman, has tested out samples of soil offered by a new producer and pronounces it excellent. The supplier is Lake Chemical Company, 250 N. Washtenaw St., Chicago, Ill. 60612.

Lead A-OK for space — Not to be upstaged by exotic alloys, good old lead set some kind of a space record when, in July, 14 tons of it were lobbed into orbit. It was probably the largest quantity of any metal to head "out there" so far. A little digging by LEAD editors also disclosed that 750,000 pounds of lead shot are used in testing of Titan III-C fuel tanks. Lead's heft can duplicate high-G stresses without countdown expense and fuss. Furthermore, when the big moment comes in a space shot, keep your eye on those umbilical connections to the gantry—they're loaded with 1500 pound lead weights (25,000 pounds in all) for balance. Would we appear too smug if we set up a Space and Aeronautics Department?



Thirty Years Ago

As a consequence of confusion about ownership, surveying parties visited Howland, Baker, and Jarvis Islands in the Pacific and left engraved lead plates mounted on cairns. The Howland plate, typical of all, reads:

HOWLAND ISLAND
LATITUDE 0°49' NORTH
LONGITUDE 176°43' WEST
THIS ISLAND IS COLONIZED
THIS 30TH DAY OF MARCH
1935 BY AMERICAN CITIZENS
IN THE NAME OF THE
UNITED STATES OF AMERICA
NO TRESPASSING ALLOWED

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lead

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