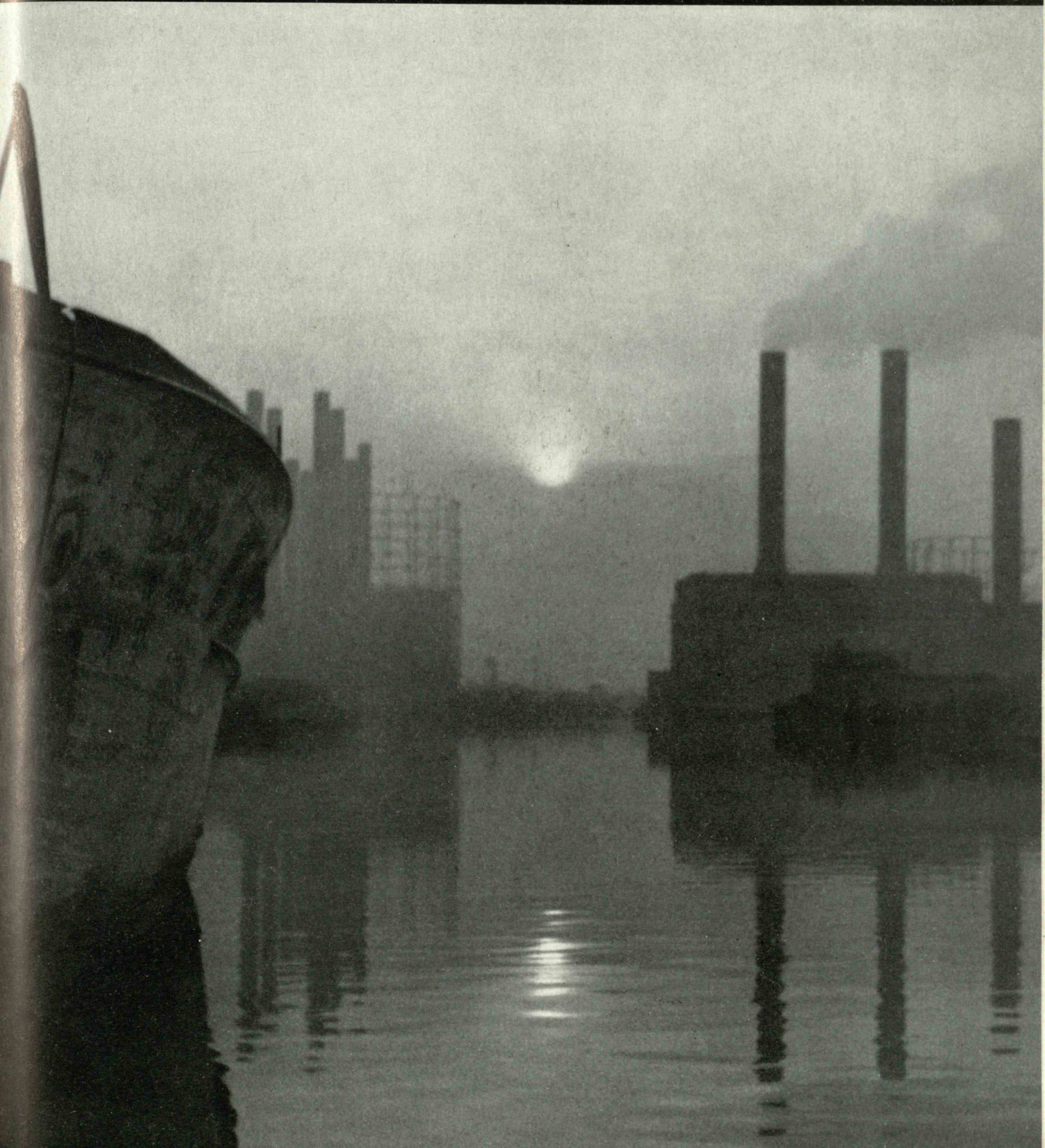
July 1936

TECHNOLOGY REVIEW



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THE TABULAR VIEW

THE Review presents in this issue (pages 385 to 410) the complete proceedings of the Transportation Conference held at the Institute on Alumni Day, and gives you here a brief identification for each speaker. ¶ The Hon. John Monroe Johnson, who presided, has had experience as a civil engineer, and as an executive; he rose from sergeant in the volunteer infantry of the Spanish war to colonel of the Engineers, Rainbow Division, in the World War. From 1916 to 1917 he was chief engineer and chairman of the Marion County Highway Commission. ¶ Edward P. Farley is chairman of the executive committee of the American-Hawaiian Steamship Company, president of a ship-line company that bears his name, and director of the International Zeppelin Transport Company. He formerly served as chairman of the United States Shipping Board and as president of the Emergency Fleet Corporation. ¶ Edwin W. James, '07, Chief of the Division of Highway Transportation of the United States Bureau of Public Roads, has served in the Philippines and has been a member of the United States Engineering Corps. In 1926 he was technical adviser at the International Diplomatic Conference on Automobile Circulation and later was in charge of surveys for International Highway. ¶ Charles D. Young, Vice-President of the Pennsylvania Railroad, has been with that road since 1900. He is acquainted with their problems "from the ground up," having risen steadily to the executive position he now holds. ¶ Edgar S. Gorrell, '17, now President of the Air Transport Association of America, was sent to Europe by President Wilson as a member of the Balling Mission and has represented the United States in more than 200 international conferences. ¶ Joseph B. Eastman, Federal Coördinator of Transportation (this office expired on June 17), received this title in 1933. He is a member of the Interstate Commerce Commission.

COVER CLUB membership has not increased with the publication of this issue as we have used another photograph submitted by William C. West, '11, whose picture, "Translucence," appeared on the April cover. The view of the Chicago River used here shows, on the right bank, the Fisk Street Station of the Commonwealth Edison Company and, on the left bank, their Quarry Street Station.

THE solution to Professor Hudson's problem in the May issue of The Review (page 325) has been submitted by A. D. Smith, '04. If you haven't finished working on it, close your eyes: I DO NOT LIKE IT SAID THE MAN WITH THE BLACK TIE. THE RITE WE HAVE WITNESSED IS IMPRESSIVE BUT WHEN YOU INTER A MAN YOU RETAIN A CERTAIN POWER OF INVESTIGATION. THERE IS BOUND TO BE A REACTION AGAINST CREMATION WHEN THE IMPORTANCE OF THIS IS REALIZED. IF THE PRACTICE SHOULD PROVE TO BE AN IMPRECATION OTHER IMPRECATIONS MIGHT FOLLOW.

MAIL RETURNS

Protest

From PROFESSOR L. MAGRUDER PASSANO:

If, in his interesting article in the May Review, "Science and the Fine Arts," Professor Hudson had limited himself to the statements of the title and subtitle, one could offer no criticism, but when he speaks of science as an inspiration of art one must, in the interest of truth, protest.

No one would deny that some scientists, perhaps as many as of ordinary men, have a true appreciation of art. But it is not wise for Professor Hudson to cite the long list of Technology men who have distinguished themselves in the arts to prove his thesis. They may well have been congenital artists whom a scientific education could not change or spoil — round pegs that succeeded in pulling themselves out of square holes. Leonardo da Vinci, perhaps the world's most universal genius, was a painter, musician, poet, and scientist in the order named. Lewis Carroll is far better known to fame than Charles L. Dodgson, the latter name being hardly more than an unfamiliar alias. Professor Hudson himself asserts that Sir Joshua Reynolds inspired the inventor Edison. On the other hand, if the science of the astronomer, Simon Newcomb, inspired his poetry, the result was shown chiefly in the *abundance* of his verse.

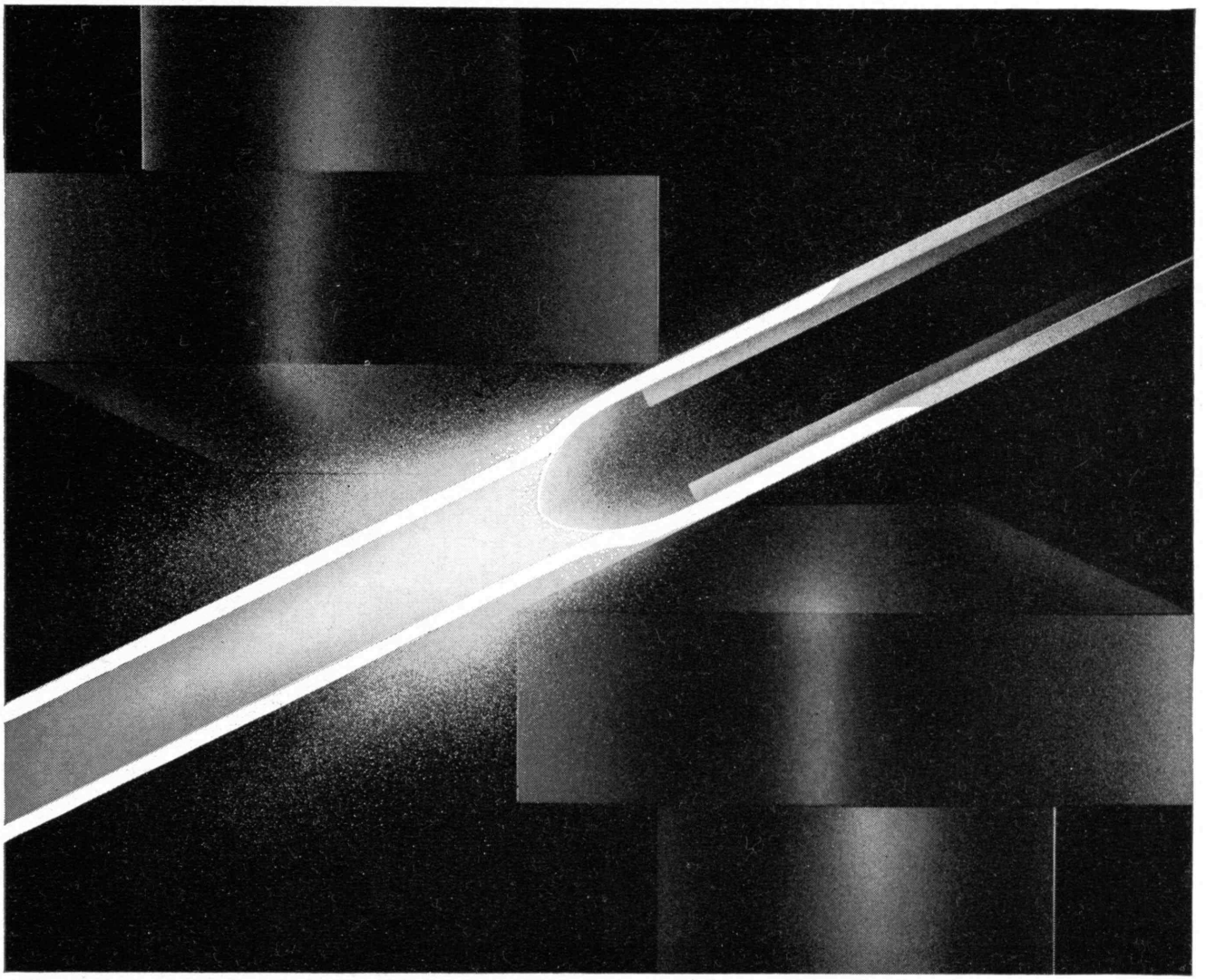
Professor Hudson surely delimits the avenues of approach of beauty too narrowly. Taste and smell may be discarded, but not touch. Any connoisseur will want to touch, to feel the texture and form of a Chinese vase, and many have the same impulse toward an ivory carving, a fine textile, or even a bronze or marble statue.

Science is ancillary to art. It is a servant helping art to achieve its ends. When carving is done by machinery, endlessly producing replicas of a pattern, like "gas pipe" suitings, one feels that the servant has left her station; that art will have married his cook. Science may also interpret art. The artist put the transverse arm of the cross where it looked best, just as he made his columns swell toward the middle in order that they might appear straight. The scientist wished to know where that "golden section ratio" lay. One of the simple rules of proportion told him. Thus: in the figure $\frac{A}{y \quad x}$, y and x are the shorter and longer portions of the vertical arm of a cross. The horizontal arm crosses at A. Choose A so that $y/x = x/x+y$. Thus $x/x+y = .618 = 21/34$ths. Having based the artist's choice of position upon a scientific theorem, the scientist can now see the beauty of the artist's work, and will henceforth insist that all crosses be made (by machinery) in exactly the same way, whether they stand on the summit of a spire or lie on the pavement of a crypt. All crosses — even the swastika — "look alike to him," provided they are scientifically made. Thus science inspires art!

The aim of art is to know, and to know what to tell — by word, by tone, by color, by form, by symbol — with wisdom as a guide and beauty as a goal. The aim of science is to know — and tell — everything about everything. "Paint what you see as you see it" is old-fashioned and discarded, replaced by "the cubistic 'Nude Descending a Staircase'" (based, by the way, on science) which tells more. These, and all schools of painting, are now to be discarded because "the camera sees so much better," and so much more, that it is to be the "art of the future," helped out by oil paintings made by spraying or by brushes revolved by machinery. Our grandchildren may look forward to exhibitions of pictures made by a combination ordinary-infrared-x-ray camera showing everything, an "all-together" that would make even Trilby blush and drive our highly moral censors insane.

One need hardly advert to the motion picture as a form of art, but a word or two seems due to the scientific music of the future. The art of music is to "be broadened if not revolutionized" by "electrical instruments," aided by a wonderful little thing called a decibel meter, and a "new type of artist must be developed to bring out the most pleasing tones" of a mechanical, electrical instrument. The apotheosis of the organ grinder.

What of poetry, the highest of the arts? One is told that "the effect of poetry is always a gamble," and Professor Hudson proceeds to gamble with a variation on a theme by Emily Dickinson. The gamble doesn't win. One need not defend Emily Dickinson, and one cannot defend her parodist. In a scientifically inspired (*Concluded on page 422*)



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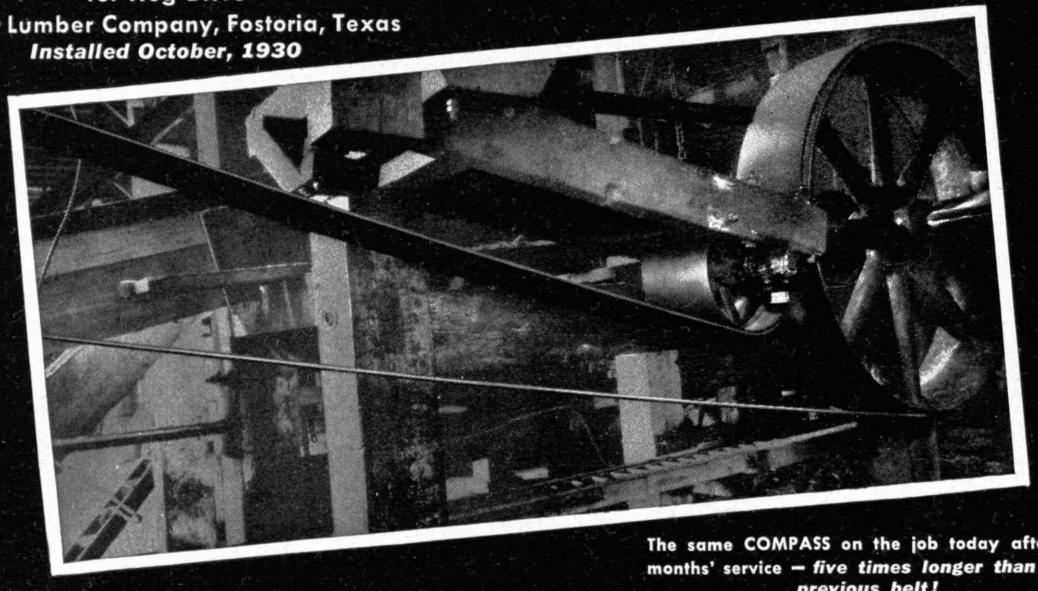

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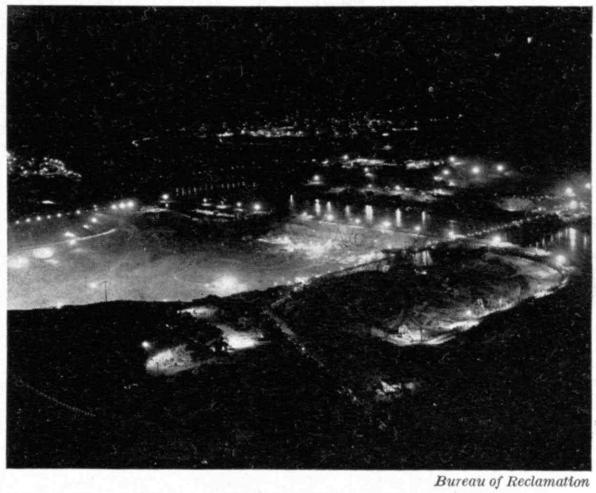

Bureau of Reclamation

Night view of Grand Coulee damsite

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CONTENTS

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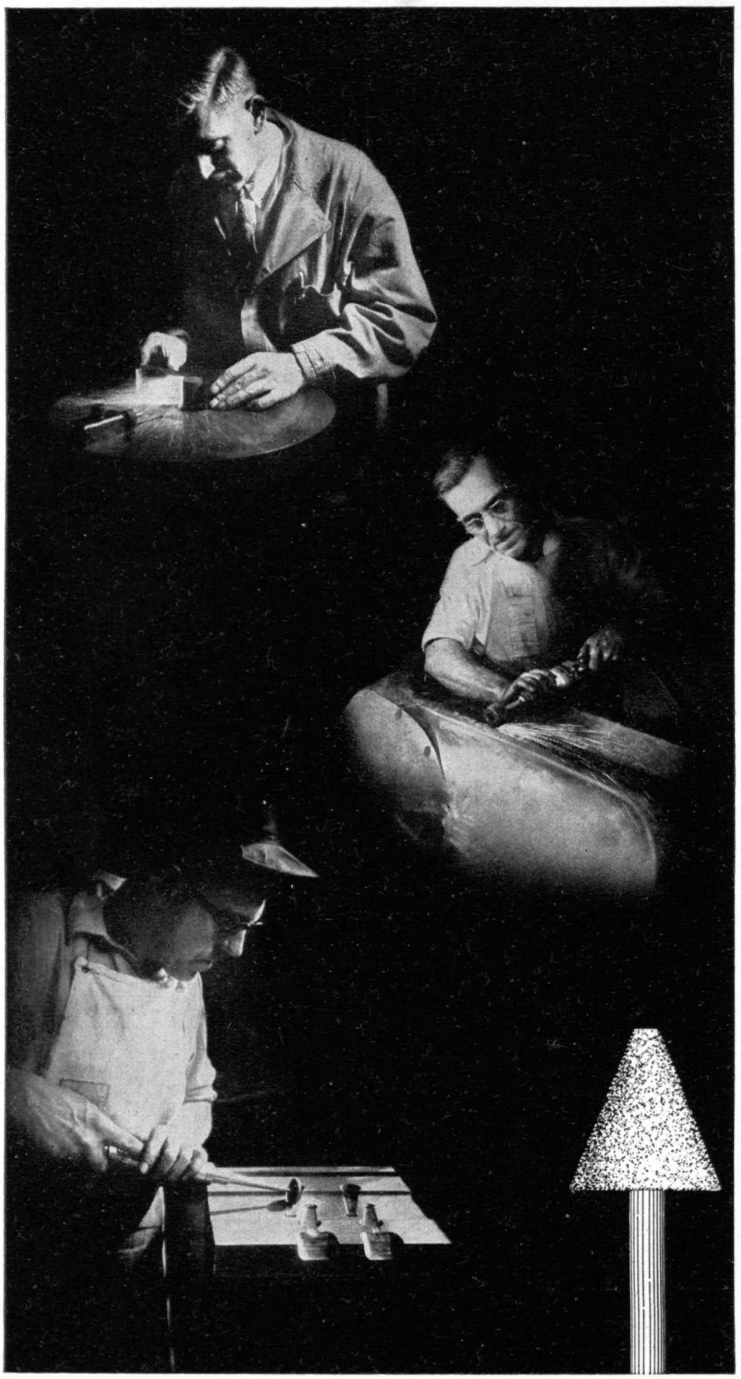

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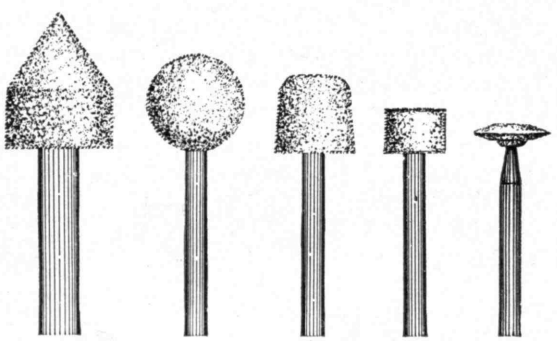


NORTON ABRASIVES

THE
TECHNOLOGY
REVIEW

Vol. 38, No. 9 July, 1936

The Trend of Affairs

Silver for Industry

WHILE silver has long been one of the noble metals, with a social and monetary "caste," its plebeian use in industry has come almost too slowly to bolster its tottering aristocracy. Research, however, now promises to give silver a new and more important place in the world of metals.

Its curious position as a metal, the conditions that surround its production, and some of the new uses to which it is being put were described by Lawrence Addicks, '99, in an authoritative paper presented at a recent meeting of the Mining and Metallurgical Society of America. Silver is forced upon the market by the silver producers, instead of being allowed to accumulate like copper, lead, and other metals in periods of economic distress. About one half of the total production of silver is as a by-product of other ores, and about 40% of all the silver produced in the history of the world is still on hand and therefore available — at a price. The production to date, according to Mr. Addicks, has totalled 15-billion ounces, so that six-billion ounces remain to challenge the application of science.

This country normally consumes some 30-million ounces of silver, of which one third is used in photography. Of the photographic silver, with Hollywood the chief consumer, a large part is recovered from the ash of burned films; even developer, when exhausted, is made to give back much of its silver by the use of treating plants attached to the darkrooms. Another third of the output goes into silverware, and this also comes back to the smelter with the changes of fashion and the settlement of estates. Other ordinary uses include perhaps two-million ounces. Mr. Addicks concluded that we ought to consume in this country not a mere 30-million ounces, but 125-million ounces.

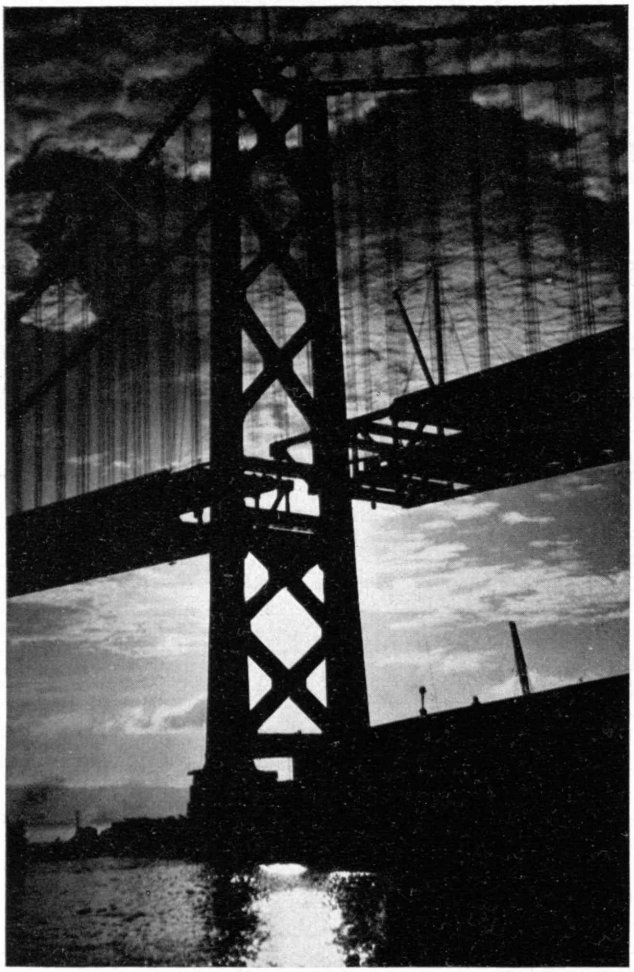
Recent research work, looking toward an increase in silver consumption, has been divided under four heads: silver alloys, especially those which are silver-poor; the physical properties of silver; the chemical properties of silver; most novel and intriguing, perhaps, of them all, value of silver as a destroyer of bacteria. Silver can prevent bacterial action where such action is not wanted, for, if silver or metallic silver ions are introduced into water in the proportion of one part in 10 million, it will very rapidly sterilize the water.

Mr. Addicks discussed this bactericidal use of silver for public water supplies and swimming pools, mentioned a pocket-sized silver sterilizer for travelers in the tropics, referred to the use of silver in purifying aquariums, told of silver-sterilized ice, suggested a nonirritant soap containing a silver salt, and stressed the fact that silver-lined containers are considered best for fruit juices. Incidentally, he mentioned that vinegar will keep indefinitely in a silver-lined container, and that wines and beers in such containers suffer no deterioration.

Silver-sterilizing spray improves the quality of tobaccos, and a German hospital has formally stated that a bolus in which silver had been mixed cured tonsilitis when enfolded in the crypts of the tonsils. External sterilization of wounds through the use of silver was yet another medical use to which Mr. Addicks made reference, recalling that the Egyptians used silver plates on wounds to promote healing.

As substantial possibilities for the use of silver he mentioned silver-alloy bearings for automobiles, which are made of cadmium and a small quantity of copper with from three quarters of one per cent to one-and-three-quarters per cent of silver added.

Lighter storage-battery plates, silver silicon, silver-hardened tin, silver sulphide as a conductor of electricity, silver commutators on automobiles — all were spoken of



William E. Davidson

Above. *Tower of the San Francisco-Oakland Bay Bridge silhouetted against an early morning sky. Stiffening trusses may be seen suspended from the main cables, and the traveler filling in deck steel*

Below. *Cape Cod Canal by night and one of the beautiful bridges designed by Fay* ('93), *Spofford* ('93) *and Thorndike*

as promising uses of silver, while the thermal conductivity of silver was emphasized as a fact important to those interested in the equalization of furnace temperatures.

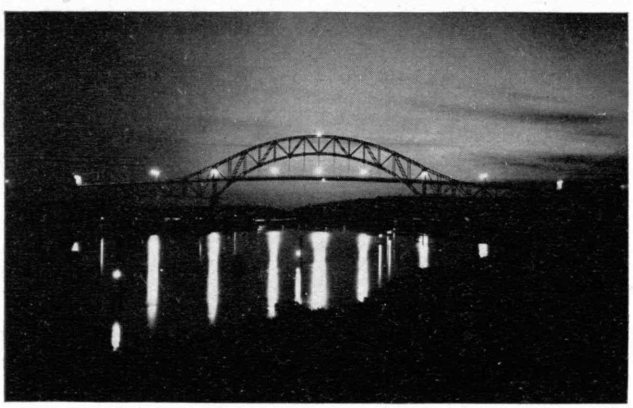
Cancer Campaigns

CANCER in the United States ranks second as a cause of death and its yearly cost to the American people has been estimated at the colossal figure of $800,000,000. The battle to conquer the scourge is being waged on a thousand fronts, and as the terms of the problem are narrowed by a truly stupendous accumulation of facts, researchers must surely be coming closer and closer to victory. Two or three recent developments, in fact, point toward an advance in knowledge that may be of lasting importance. That the task of research may be more direct than we have thought was indicated in February when Dr. Francis Carter Wood, director of the Crocker Institute of Cancer Research at Columbia University, suggested that the search for the cause may be narrowed to a comparatively small number of agents "responsible for many types of animal and, possibly, human cancer." Though the task of finding the cause will not necessarily be rendered any less arduous by the suggested limitation of possibilities, it will be clarified somewhat if Dr. Wood's belief is confirmed. The great variety of cancerous growths has in the past occasioned belief that the number of causes might be equally great. One parasitic worm has produced 18 varieties of tumor in rats, however, and chemical substances which have been used experimentally to produce cancer, it is reported by Dr. Wood, "bid fair to produce an equal or larger number."

In 1775 an English physician observed that the cancer prevalent among chimney sweeps was caused by soot, and in 1915 two Japanese scientists, by repeatedly painting the ear of a rabbit with tar, induced there a cancerous growth. These widely separated discoveries established coal tar (or some of its derivatives) as a causative agent in certain types of cancer, and provided the investigator with a method for the experimental production of cancer in laboratory animals.

They also posed a problem for the organic chemist: Is there some common denominator, perhaps of molecular structure or some other chemical relationship, among the various cancer-producing coal-tar compounds that have been discovered in his laboratory? There is yet no assurance that such a common factor, present in these compounds, can be found, but chemists are at work on the problem.

The baffling hunt for the cause of cancer may have been given new and more nearly correct direction by these findings, but no basis for prediction of the early discovery of a cure has been set up by it as yet. Setting one disease to fight another, as has been done in some other fields, was, however, reported by Dr. Mendel Jacobi of the Beth-El Hospital in Brooklyn as possessing effectiveness in experimental work on cancer. Injections of a diluted filtrate of the typhoid bacillus were used by Dr. Jacobi to treat animals having tumors chosen for their "high growth energy and degree of malignancy." The filtrates were first injected directly into the tumor, and about a day later a general injection was made through a vein of the abdominal wall. In the 70 animals thus treated the tumor began to break up within a few hours and finally disappeared. The local injection, it was found, must be made first, and neither injection is effective if used alone. Although the method was used in one human being, already moribund with a hopeless



A. S. Beale, '13