January 1933

TECHNOLOGY REVIEW

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THE TABULAR VIEW

UPON entering a new year The Review greets its subscribers, wishes for them a fuller measure of life's durable satisfactions, bespeaks for them a year of regeneration and fulfillment.

To its readers, The Review also renders a report, as is common at this season, and makes acknowledgments. Its circulation is again climbing and its revenues are slightly larger, but nevertheless larger. It has ample evidence that its audience has widened beyond its circle of regular subscribers, that the radii of its influence and appeal are steadily sweeping greater arcs. The depression years have left scars but they have not disabled. The Review has never been so sound as 1935 finds it.

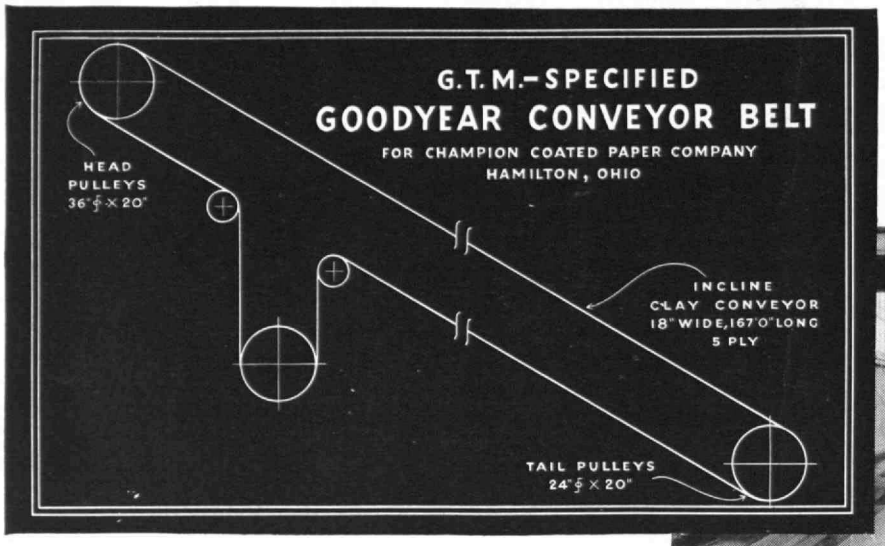
To our subscribers belongs the final credit for this state of health. The Review contents have been inspired and improved by its readers' understanding and appreciation. Their discrimination and interest have drawn to these pages not only gifted contributors, but quality advertisers who have found, because they merited them, ready and profitable responses.

With the readers it now has, and with the additional ones it will have, The Review hopes to put into effect many plans which have been held in abeyance because of the depression. We always welcome comment and we hope that readers will write us whenever they have suggestions.

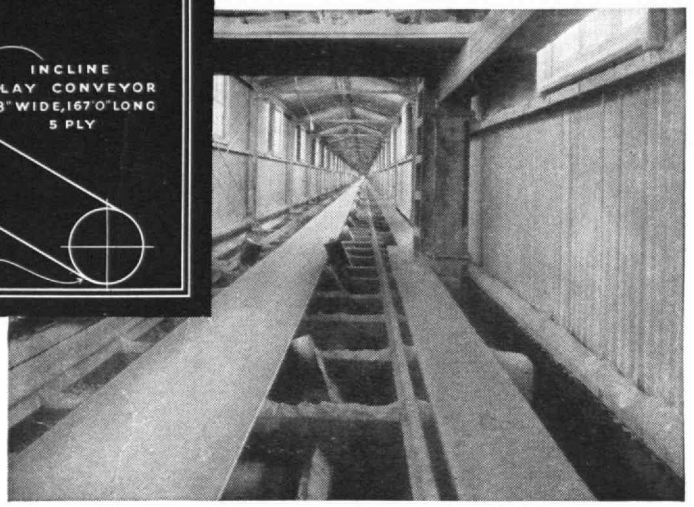
IN introducing President Karl T. Compton before a recent meeting of the United States Institute for Textile Research, Inc., Francis P. Garvin spoke of him as "the man who, I think, holds the most important position in the United States today because, as Chairman of the National Science Advisory Board, it is his task to introduce the advance of science into the efficiency of modern government in this country." ¶ H. E. LOBDELL, '17, is Dean of Students at M.I.T. and Publisher of The Review. He admits being a stamp collector — a philatelist, rather —, and cultivates a specialty in postally-used pairs of bilinguals from the Union of South Africa and from Southwest Africa. Some of the stamps used to illustrate his article are by courtesy of the Scott Stamp and Coin Company and others were drawn from collections of members of The Review Staff, and from the famous Fernstrom collection. ¶ FREDERICK K. MORRIS is a Professor in the Institute's Department of Geology. His article was first presented as a radio broadcast sponsored by the New England Section of the American Chemical Society.

UNDER "Mail Returns" on page 148 will be found some typical replies from Review readers to the question we raised in this space last month on the propriety of The Review carrying advertising of wines, beer, and spirits. We acknowledge with appreciation the score or more letters which have been received. Every letter, without exception, approved the absence in these pages of liquor advertising.

THE CHAMPIONS OF CHAMPION



Goodyear Conveyor Belts set record in world's largest coated paper mill



Installed 1920—and still on the job

14 years' service proves value of G.T.M. Specification

IN THE great modern plant of The Champion Coated Paper Company at Hamilton, Ohio, three veteran conveyor belts have quietly proved themselves champions by every test of belt performance.

Back in 1920 the G. T. M. — Goodyear Technical Man — was called to Hamilton and consulted about belts for the conveying system handling the fine clay used in giving Champion papers satin-smoothness.

Carefully considering all factors the G. T. M. recommended a 5-ply Goodyear Conveyor Belt, 18" wide by 167' long, for the incline conveyor. Another 1372' long for the distributing conveyor, and a third, 14" wide by 1440' long, 4-ply, for the reclaiming conveyor. These belts were built to specification and installed in late 1920 and early 1921.

Today, after rolling on their appointed rounds, day after day, month after month, for some 14 years—after moving nearly seven hundred million pounds of clay — these three belts, while somewhat worn to be sure, are still good for another year of stalwart service.

That's the kind of trouble-free, low-cost, uninterrupted performance you want from belts—and that's what you get when you have belts accurately specified to your operation by the G. T. M., as records in scores of industries prove.

Why not see what this competent expert could do for you. To bring him, write Goodyear, Akron, Ohio, or Los Angeles, California — or call the nearest Goodyear Mechanical Goods Distributor.

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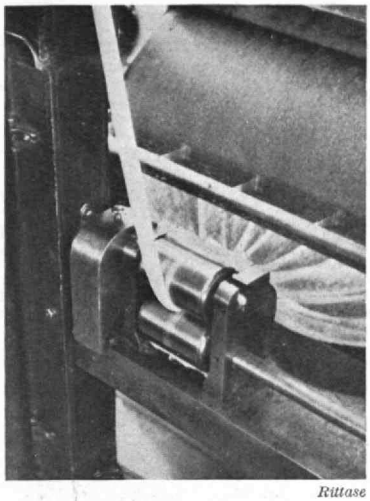
HOSE • PACKING
MADE BY THE MAKERS OF GOODYEAR TIRES

THE GREATEST NAME IN RUBBER

NRA CODE

GOODYEAR



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THE TECHNOLOGY REVIEW

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A Message from

GUGLIELMO MARCONI

to

The National Research Council

WE ARE at a turning point in the history of humanity. A thousand signs show us that economic relations are in course of change. One age has gone, a new one begins. Whatever may be the economic structure toward which we march, it is certain that it will be very different from that which moulded the life of men when we were born.

"Mechanical and technical progress — and in the first line of importance, constant increase in communication and transport facilities — have troubled the old economic traditions to their foundations. Today, humanity finds itself before the problem of willing hands made idle. This is one of the gravest manifestations of the upheaval: an evil that can no longer be regarded as temporary and which must be attacked at the root. Many nations, conscious of the immensity of the phenomenon and the tragedy of its consequences, have sought the remedy in economic nationalism: a vain illusion! They but aggravate the evil.

"This must be said of the machine, which many hold responsible for things gone wrong but which lightens man's labor and aids him to conquer an otherwise unconquerable nature: we can not renounce it without retracing our steps on the highway of civilization. It is the discipline of the machine that must be achieved so that, while serving man, it may not steal away his joy in work. It is only now that scientific research is organizing to attain that marvelous end. In my opinion, every effort of science should be directed toward the development of agriculture, the creation of new industries and of new opportunities for work.

"Never has scientific research been as economically and socially necessary as it is today — but improvisations are impossible and reliance upon them is stupidity. There must be organic, planned, and rigidly disciplined work with patiently provided instruments. Scientific research must have the requisite means to work with. The State should think of this but the State can not do everything. Those who can should contribute to scientific research, and largely. They would be giving to a holy cause. I have seen marvels come from slender means and, for the good of our country, I hope my appeal will not go unheard."

[The above message, transmitted by the State Department late last month to the National Research Council, so aptly expresses the forward-looking attitude of the present-day scientist and inventor that we are happy to have the opportunity of presenting it here. It was prepared during the Twenty-Third Convention of the Society for Scientific Progress assembled in Naples. — THE EDITOR.]

THE
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The Trend of Affairs

Notes and Observations

SCRIVEN BOLTON, the artist-astronomer, has prepared a graphic model showing the earth as it might appear to a person who, willy nilly, had planked himself down on the moon. That earth is a colossal and horrendous thing, looking millions of times bigger in the heavens than the largest orb available to our naked vision. In a day when astronomy and the sciences of macro- and micro-cosms make us begin to doubt the all-sufficient importance of man and his earth, it would be refreshing to us serious humans if we could travel the 237,857 miles to the moon and see the earth in such grandeur. It would probably be worth frying at 278° F. by day and freezing at −132° F. by night to restore a self-respect shaken by the immensity of the universe.

OF ALL the plays dealing with scientific achievement, "Yellow Jack," portraying in noble and dramatic form man's struggle against yellow fever with emphasis concentrated on the work of Walter Reed, is one of the finest yet produced. Overshadowed in popular appeal by Pulitzer-prize-winning "Men in White," it enjoyed a relatively brief run in New York last spring.

In addition to the main thread of the story, the play has many implications. One of these, suggested early and not developed, becomes particularly significant in view of the rapid development of intercontinental air transport as described by The Review last month. Early in the play there is controversy between a Minister of Air Transport and a doctor interested in yellow fever. The Minister, it appears, objects to the quarantine of six days imposed on the west coast of Africa. How, says he, can one reconcile six days of quarantine with one day of air travel?

The point is well taken and opens up a serious question for medical and transport sciences. Nature unfortunately has not succumbed to the speed mania of humanity and will make no concessions in the life cycle of the bacillus or the time development of a virus. The possibilities of the spread of dread Oriental and African diseases into the purlieus of the white race through our newfound vehicle of travel are rather appalling and proffer one of the most tantalizing problems of coördination of science yet presented to man.

NOT many years ago in a musical revue Jimmy Schnozzola Durante, then unknown to Hollywood, was accused by one of his stooges of having a head of wood. To this, the classic mug comedian of our day made a classic response in the shape of a long song demonstrating where the United States would be

BAEDEKER
For this Section

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ABRACADABRA

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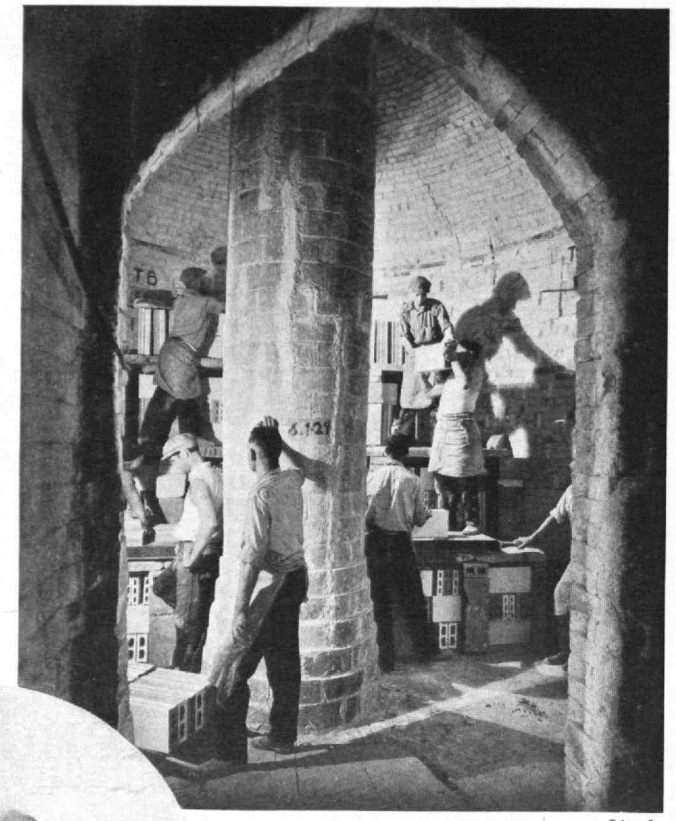
today had it not been for wood. The song was accompanied by demonstrations of wooden objects which have guided our history, piled by the assiduous Durante and his assistants into a large and somewhat obscene pile which nearly filled the stage. There is more truth than poetry in the song.

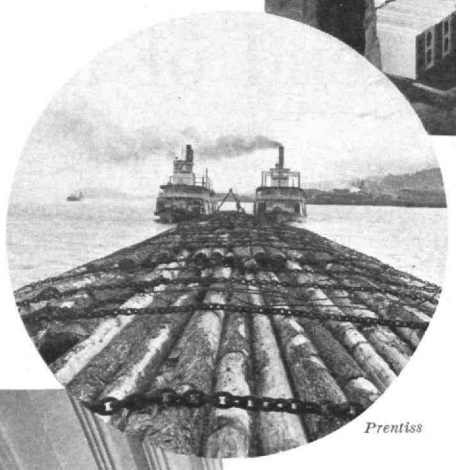
Wood has a wonderful elasticity against attack, a remarkable variety of uses. It always bobs up in some new place. The Germans in their intense search for complete "*Ersatz*" have found ways of making sugar from it, nothing daunted by the fact that it takes a lot of trees to make a very little sugar. In this country purified cellulose from wood, one of the most versatile of materials, is used in making textiles, plastics, roofing, and, of course, paper. Even that plebeian tree, the slash pine of the South, may be transmuted by the alchemy of the modern chemist into the most gossamer rayon. Last month the indefatigable Charles H. Herty of Savannah, who has been working on slash-pine newsprint, announced that his laboratory had made sulphite wood pulp, the base of rayon, from slash pine. This pulp, produced at half the usual cost, has been made into rayon of good spinning and color qualities.

It is interesting to note, too, that the wooden bridge is far from being a thing of the past. Out on the West Coast where tall trees are common, the highway departments are finding new methods of building substantial trestles entirely with prefabricated timber, and attractive bridges they are, too. Based on life and cost, these viaducts appear to be cheaper than those of steel. All this simultaneously with the announcement from Britain that the last of the great timber viaducts designed by Brunel, resident engineer of the first Thames tunnel, has been replaced by a masonry arch and from York Village, Maine, that a new timber trestle recently opened by the state highway department recreates, at least in appearance, the original bridge of 1761. Truly man's activity sometimes seems as busy and as incoherent as the tangential runnings of ants upon their hills.



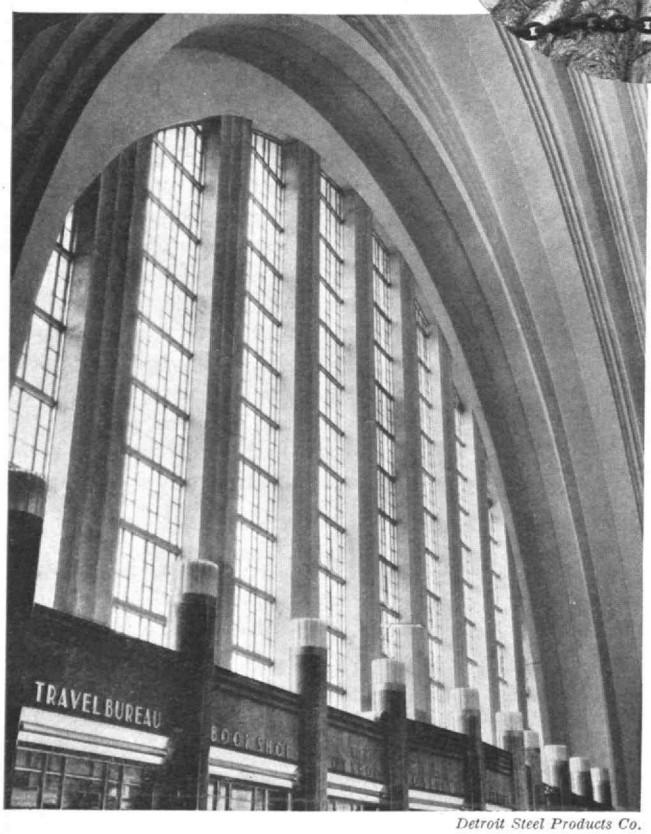
Lincoln

Above: *This terra cotta kiln has an unexpected Gothic quality*



Prentiss

Right: *Transporting logs in Puget Sound*
Below: *World's largest window — a double aluminum bay in the Cincinnati Union Terminal*

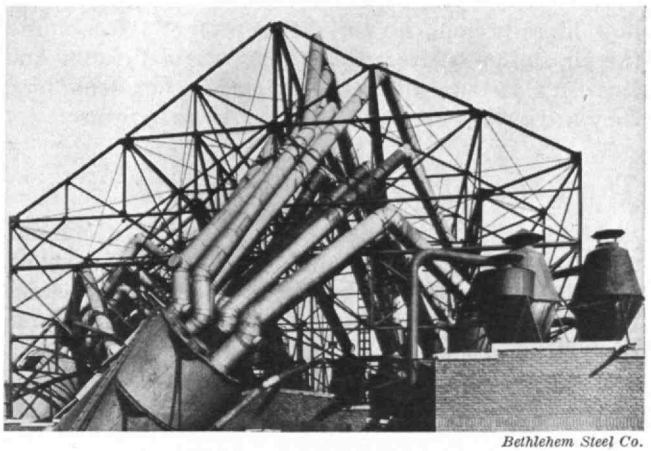


Detroit Steel Products Co.

A DECISION, made last July, to recast the 200-inch mirror for the great Palomar Mountain telescope has finally resulted in the act of recasting, successfully completed early in December. The necessity for doing the whole thing over throws an interesting side light on scientific journalism.

It is, of course, a long-established and sound principle of newspaper reporting that the writer must never assume the reader has heard of the subject before and must recapitulate, however briefly, all the essential facts. Applied to the Caltech telescope, this means that for the past few weeks we have had stories to the effect that the mirror was about to be cast, that it was being cast, that it had been cast. With very minor technical differences, these stories were repetitions of earlier ones.

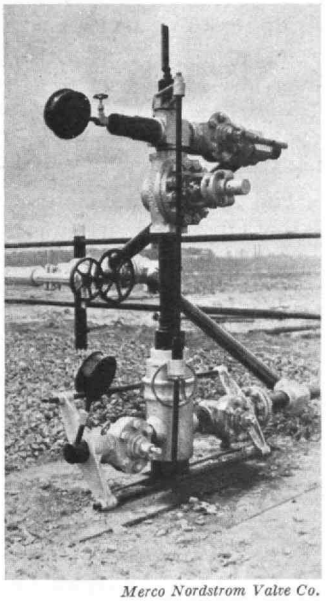
The mirror will now take six months to cool, during which we may expect bedside bulletins from the chilling patient, all of which will also tell us how big the mirror is, where it is going, and why and how it was made. Finally, in the five-and-a-half years required to finish the great piece of glass subsequent stories may be expected. If there is one piece of scientific apparatus that should be well understood by the time it wheels cumbrously into position, it should be the great telescope of Palomar Mountain.



Bethlehem Steel Co.

Wingless Wonders

AFTER a period of penance and meditation, the autogiro has come out of hiding again. We recently saw the new wingless model land on the end of a pier in the East River and take off again, and a neat little trick it is indeed. Just what bugs are left in remain to be revealed, because the pilot on this occasion was one Jim Ray, who is beyond doubt the best giro pilot in the known inhabited universe and one who can make the toughest ship look good. The more striking features of the new clipped model are the quickness with which it maneuvers and the definite control apparent even at a speed of five or ten miles an hour.



Merco Nordstrom Valve Co.

Certainly the autogiro has come a long distance during the last 18 months. The plot of the story has been something like this: For several seasons preceding the spring of 1933, the giro was widely pushed in this country by the Pitcairn Manufacturing Company and the Kellett Autogiro Company. Their early models had fixed wings and orthodox airplane controls which were ineffective at the extremely low speeds at which they landed. Outside of a few dozen ships sold for publicity or sign-towing uses, the sales results were not what the promotors expected, partly on account of the control feature and largely because the planes were inefficient as load carriers and low in top speeds as compared with airplanes of equal horse power. They were also expensive.

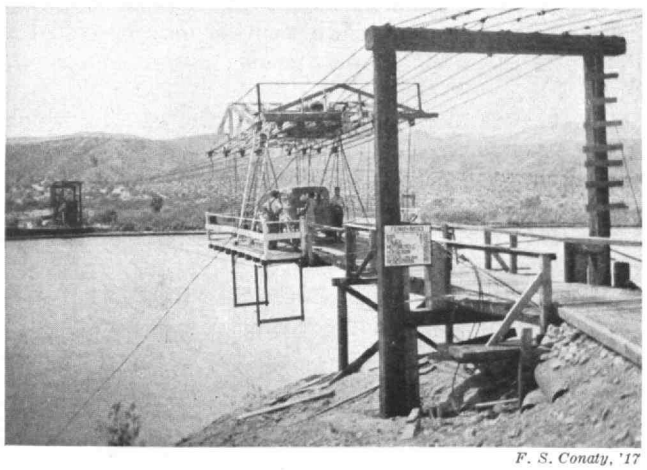
Then Cierva brought out in England the giro without any fixed wing which was controlled by tilting the rotor axis in relation to the vertical axis of the ship, and it seemed so much the perfect answer to the giro salesmen's prayers that the Pitcairn Company immediately started building one over here. When it was finally launched in the spring of 1933, it proved to be what the *New Masses* would call the Kiss of Death to the giro cause. Both factories ceased production on the old wing models and announced that they would confine themselves to further research. The result of this study is the new wingless type which we saw in New York, which is an adaptation of the earlier English model.

The Pitcairn is a small, two-place, side-by-side cabin job, powered with a 75 horse-power, Pobjoy geared engine. It really does not have any wings at all, nor has it any movable elevators. Its fuselage is about normal in length and has fixed horizontal and vertical stabilizing surfaces, and a very diminutive rudder which is not used in ordinary maneuvers. With the astoundingly low empty weight of 600 pounds, it has a gross weight when fully loaded of 1,140 pounds, a top speed of 105 m.p.h., and a landing speed around 15 or 18 m.p.h.

The Kellett, which has been aimed at the military and more utilitarian services rather than at the private buyer, is a bigger, open, two-place, tandem design with a 225-h.p. Jacobs engine which is expected to have a top speed of about 125 m.p.h. and carry a gross weight of 2,050 pounds, though its empty weight is only 1,350 pounds.

What is closest to the Pitcairn heart, we understand, is the following plan. They will add even another adjustment in the rotor, making it possible to change the angle of incidence of the rotor blades to that of zero lift. They then will run the rotor up to some excess speed over its normal (about 40% or 50% would suffice), pull a lever restoring the normal angle and

Top: *Study in complexity. A dust-collecting system in Baltimore.* Center: *What oil men call a "Christmas Tree."* Below: *Improvised cable ferry over Colorado River, 40 miles south of Boulder Dam. A Model-T engine supplies power*



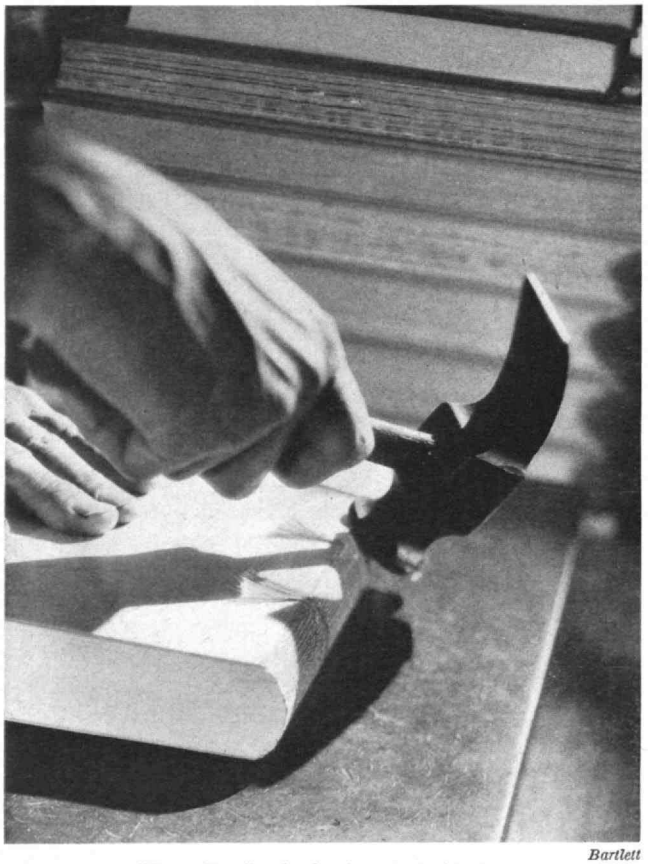
F. S. Conaty, '17

hop, literally hop, the perky things 50 or 100 feet into the air and go off from there into a normal climb. And this isn't just an ultimate idea either, but something they are serious about tackling in the near future.

The Language of the Railroad

ALTHOUGH the streamlined train basks complacently in the light of public interest for the moment, and there is much talk of Diesel engines and electrification, the romance of steam railroading is far from dead. Out in the great terminal yards, in the roundhouses, and on the *run*, the railroad man still lives in the traditions of his kind and speaks a language all his own.

The vocabulary of the railroad man has developed slowly, but unlike the language of the sea, the automobile world, aviation, and gangdom, his terminology with few exceptions has remained esoteric and has not become part of the vocabulary of the general public. He has coined pungent names and succinct phrases to indicate affection, contempt, disgust, or simply to describe a railroad operation briefly. Whatever he has called his locomotives, be it *mill*, *kettle*, *coffee pot*, *road hog*, *pig*, or *battleship*, they have always been referred to in the feminine gender. The term *she* has been the subject of much controversy, but whatever its origin, there seems little doubt that it expresses the very real affection railroad men have for their locomotives. These prima donnas of power are petted and pampered by their crews, and there are few engineers who do not believe that each has a personality of *her* own. One may be *nervous as a cat* while another is *cranky*, and some are *stubborn* or *fussy* and need coaxing. A few have been accused of being *fickle*.



Bartlett

"Rounding" a book. A study in binding

Lincoln

"After Apple-Picking"

Possibly the railroad man has been influenced by the sailor who has always given ships feminine attributes. W. S. Scarboro, road foreman of engines for the Central Vermont Railway lightly suggests that the feminine gender is appropriate for locomotives because they wear "jackets with yokes, pins, shields, and stays. They have aprons, pumps, and hose. Furthermore, they drag trains behind them."

In his famous railroad story, "*.007*," the scene of which is laid in Boston, Rudyard Kipling personifies his locomotives. With one exception, his engines discuss each other in the masculine gender. A compound, contemptuously described as an experiment, is definitely feminine, a haughty person who "seemed to be talking halfway up *her* smoke-stack." The spick-and-span, eight-wheeled American type locomotive, *.007*, the leading character; a freight *Mogul*, the Pittsburgh *Consolidation*, a switcher and a commuting engine are, as Kipling makes them, "gentlemen" and "brothers among locomotives."

Railroad engineers are called by various names in different sections of the country. Those most commonly used are *eagle eye*, *hogger*, *hog head*, and *throttle puller*. Now and then one hears the engineer of the second engine of a double-header referred to as a *smoke-eater* or *cinder man*, while his engine may be called a *cinder trap*. A fireman is a *diamond pusher*, *tallow pot*, or *fire boy*.

Conductors are often addressed as *captain*, which may have been borrowed from the vocabulary of the sea, for as the captain is master of his ship, so the conductor is captain of his train. Brakeman is a term carried over from the days before air brakes, when members of the crew climbed to the tops of freight cars or rushed to the vestibules of passenger cars to apply handbrakes when the engineer signaled a stop with two sharp blasts of the whistle. The slang names given to brakemen now apply chiefly to those in freight service, where they are known as *shacks*, *groundhogs*, *fielders*, *car catchers*, and *hind pins*, the latter indicating the