In connection with the qualitative characteristics of the brain, the early investigations of Bean (30. Bean, R. B., "Some Racial Peculiarities of the Negro Brain," Amer. J. Anat., 1906, 5: pp. 353-432) have focused attention upon possible Negro-White differences. In a series of studies Bean arrived at the conclusion that the frontal area of the brain was less well-developed in the Negro than in the White, and the posterior area better developed. He believed that this difference paralleled the "known fact" that the Negro is inferior in the higher intellectual functions and superior in those concerned with rhythm and sense perception. Another important difference was in the depth of the convolutions of the cortex, those of the Negro being much shallower and more "childlike" than those of the White. There were also differences in the shape of the corpus callosum, which connects the two hemispheres of the cerebrum, and in the temporal lobe, but these were not regarded as having any direct psychological significance. It happened that these studies were carried out at Johns Hopkins University under the direction of Professor Mall, head of the Department of Anatomy. Mall was for some reason uncertain of Bean's results, and he repeated the whole study (31. Mall, F. P., "On Several Anatomical Characters of the Human Brain," Amer. J. Anat., 1909, 9: pp. 1-32) on the same collection of brains on which Bean had worked; he took the precaution, however, of comparing the brains without knowing in advance which were Negro and which were White. Then he and his associates placed, in one group those brains which had rich convolutions, and in another those with convolutions which were shallow, they found exactly the same proportions of Negro and White brains in the two groups. When further they measured the size of the frontal and posterior lobes in the two groups of brains, they found no difference in their relative extent in the two races. Mall came to the conclusion that Bean's findings had no basis in fact, and that it had not been demonstrated that Negro brains differed in any essential manner from those of Whites. Incidentally, these two studies taken together illustrate in a very significant manner the importance of stereotypes and "mental set" in determining what one will see in any given situation. There can be no doubt that Bean was sincere in his belief that he had observed these differences between the two groups of brains. It seems clear, however, that because of the expectation of finding signs of inferiority in the Negro, and because of his knowledge of the racial origin of the brains he was examining, he actually "saw" differences which did not exist. In any case, Mall's more carefully controlled study testifies
to the fallacy of the popular assumption that one can recognize a Negro brain by the presence of certain definite inferiorities. (Otto Klineberg, Social Psychology, 1940, pp. 291-292.)

II

R. T. LePiere ("Attitudes versus Actions," Soc. Foro., 1934, 13, 230-237) has shown, however, that questionnaire results do not always check with life situations in which the raters have the chance to carry out their professed beliefs. LePiere and a Chinese couple traveled over the Pacific Coast and, to some extent, elsewhere, stopping at inns and auto camps. Although, in many instances, the Chinese gentleman did the contacting for rooms, there was only one refusal of lodging. When, later, LePiere questioned by mail these same innkeepers and a comparable group of others concerning their acceptance of Chinese guests, many claimed that they would not accept them. Their verbalizations were, undoubtedly, affected by a number of economic and social factors; fear of what their competitors might say is probably one of these. In other words, what they had actually done did not check with what they said they would do if such situations should arise. (R. T. LePiere and F. R. Farnsworth, Social Psychology, 1936, pp. 238).

III

To illustrate the difference between words and reality, I might tell the story of a fiery Communist, fiery in words at least, who talked of revolution and barricades and the uprising of the proletariat as if he were talking of a spectacle in an opera. I asked him: "Look, my bloody-thirsty friend, did you ever see one dead man? Did you ever see a man killed by violence, his head smashed in, his brains oozing out, his eyes staring and mouth repulsively open? Did you ever see a dozen such dead—ten thousand? Have you heard the groans and curses of the wounded, begging the relief of death?" Well, though he had not, he was not impressed by my eloquent dilatation of horrors.

One day I was called to his house. His little girl had been injured by an automobile; she was unconscious and covered with blood. Fortunately I was able to reassure the distracted man that his adored daughter would do well and that he had nothing to fear. He looked at me long and curiously and said: "From this day on, I am no revolutionary. What you said to me lingered in my mind even though
I rejected your words as those of a comfortable bourgeois. Then when I saw my daughter unconscious and bloody on a muddy street, I visualized revolution, not as an abstract term, but as daughters and sons lying in filth, dead and mutilated."

I believe therefore that Dante could not have felt the reality of the eternal and horrible hells that he portrayed; that he intoxicated himself with the smell and the sounds of words and never tried to imagine the stench and screams. Children say: "I'll kill you"; people say: "You're crazy," without meaning more than a vague symbolism. Not thinking about the conflagration of which their words are a distant glow, men can go on from one unfelt symbolism to another and finally reach a fanatical belief in something of which they have no concrete knowledge at all. I know ardent socialists who passionately love their private property and yet are able, by verbal magic, to live at once in two worlds, one of real capitalism and the other of verbal socialism. (Abraham Myerson, Speaking of Men, 1950, pp. 100-101)

IV

The flesh of the monetes is light-colored and tastes much like fresh pork. It is such excellent eating that the animal was in danger of being exterminated by the settlers and tourists. Kirk Munroe related how he had introduced a bill in the legislature in which he left out its common name and put in only the scientific one, Tribocheus istiostris, a bill which raised the penalty for killing one $500.00. The measure hung fire until the last day of the session. Then one senator got up and declared:

"If there is a beast with any such name as that in the State of Florida it ought to be protected." Everyone agreed with him, and the monetes became a protected animal. (David Fairchild, The World Groves Round My Door, 1947, p. 64)

V

How much does the boss make? To the boss, that has long been an understandably important question. But in the postwar fight over wages, another important question has bobbed up: how much do the workers think the boss (i.e., the "proprietors," the managers, and the stockholders) make?
To find the answer, the Los Angeles Merchants and Manufacturers Association recently hired a professional pollster to ask a cross-section of Los Angeles residents. Of some 1,000 who were interviewed, more than half thought the employers must get around 50% out of every incoming dollar, almost a third thought they got upwards of 75%. Barely one tenth of them were reasonably close to the nationwide average: 9 1/2% out of every dollar (according to the latest figures—September 1945—of the Department of Commerce).

In its current monthly bulletin, the Guaranty Trust Co., of New York deplores these "shocking misconceptions," and management's failure to do anything about them, said the Guaranty Survey: "The effects of industrial unrest are tragic enough in any case, but they are doubly tragic if they arise from such profound misconceptions as these..." (Time Magazine, Aug. 26, 1946)

VI

Not long ago a very enthusiastic classicist, a lawyer by profession, was talking about the values and benefits of classical education. He said, "I have found it tremendously valuable; it puts money in my pocket. I want to tell you how it is done. A client of mine, who was arrested for drunken driving and who had pleaded guilty, found himself in a position involving political complications and it became very necessary for him to be let off. Therefore, I was engaged as his attorney. I didn't know how I was going to get a man off when he had already confessed himself as guilty. So I decided that I would cross examine the doctor who had certified that my client was drunk. After the doctor took the stand I put this question to the witness, 'Doctor, what would you say if I told you the defendant was a pseomaphagist?'

The doctor scratched his head and said he didn't know; it was probably pretty serious. Then I said, 'What if I should tell you, doctor, that my client is a congenital pseomaphagist?' The doctor shook his head, 'Pretty serious.' In the meantime, many law attendants were scrambling in the dictionary. After the doctor admitted that it was a very serious condition, I successfully moved that the case be dismissed."

The lawyer had played a simple trick. He merely made up a word from Greek roots: "pseomaphagist" means nothing except a person who boils his food. It is very difficult to find in the dictionary. In the first place, it isn't there, and in the second place, it begins with "ps"
Instead of an "s." Clearly this anecdote illustrates a
certain type of communication, and I should say that it
is against this kind of thing in its ancient form in clas-
sical Greece that Plato moved with all the power of his
mind and his thought. (Whitney J. Oates, "Classic Theories
of Communication," in The Communication of Ideas, edited
by Lyman Bryson, 1948, pp. 28-29)

VII

At my first admission into this printing-house I
took to working at press, imagining I felt a want of the
bodily exercise I had been us'd to in America, where press-
work was mix'd with composing. I drank only water; the
other workmen, near fifty in number, were great guzzlers
of beer. On occasion, I carried up and down stairs a
large form of types in each hand, when others carried but
one in both hands. They wondered to see, from this and
several instances, that the Water-American, as they called
me, was stronger than themselves, who drank strong beer;
We had an alehouse boy who attended always in the house
to supply the workmen. My companion at the press drank
every day a pint before breakfast, a pint at breakfast
with his bread and cheese, a pint between breakfast and
dinner, a pint at dinner, a pint in the afternoon about
six o'clock, and another when he had done his day's work.
I thought it a detestable custom; but it was necessary, he
suppos'd, to drink strong beer, that he might be strong to
labor. I endeavored to convince him that the bodily
strength afforded by beer could only be in proportion to
the grain or flour of the barley dissolved in the water of
which it was made; that there was more flour in a penny-
worth of bread, and therefore, if he would eat that with
a pint of water, it would give him more strength than a
quart of beer. He drank on, however, and had four or five
shillings to pay out of his wages every Saturday night for
that muddling liquor: an expense I was free from. And
thus these poor devils keep themselves always under.
(The Autobiography of Benjamin Franklin)

VIII

There were instances in which the Research Branch
was able to obtain a kind of experimental proof, even in
situations that were not deliberately set up as controlled
experiments. For example, the Army tried out in Europe the
radical idea of placing an entire platoon of Negro volunteers
in a white infantry combat company. This was done in sev-
eral divisions, most of which saw several months of subsequent
battle. At the end of the campaign interviewers polled sample groups of men in several divisions to find out how the attitudes of men who had served with Negroes compared with those of men who had not. In divisions that had no mixed companies, 62 per cent of the soldiers said they would dislike very much to serve in the same companies as Negroes. Of white infantrymen who had fought in the same divisions but not the same companies as Negroes, only 20 per cent said they would dislike it very much. And among white infantrymen who had actually been in the same companies as Negroes, only 7 per cent said they disliked it very much.

There was another very interesting finding. Two thirds of the white men in the mixed companies, when polled after the experience, said that they had been opposed to the scheme beforehand and had thought it would fail. This was almost exactly the same proportion of opponents as was found in divisions that had not experienced the plan; in other words, the retrospective answers about attitudes corresponded closely to those of groups reporting current attitudes, so one finding tended to confirm the other. (Samuel A. Stouffer, "A Study of Attitudes," Scientific American, May, 1949, p. 14)

IX

Recently FORTUNE staged an informal experiment—and of a type the reader can easily try out on his associates. A cartoon chart of "The Four Goals of Labor" was clipped from a C.I.O. newspaper and photostated. A new legend, however, was attached at the bottom: "From June 3 National Newsletter." Twenty C.I.O. members were then shown the ad and asked if they thought it was a fair presentation of labor's goals. Four grudgingly said it was and two couldn't make up their minds. The remaining fourteen damned it as "patronizing," "loaded," "paternalistic," "makes me want to spit"....(Fortune, Sept., 1950)

X

Even with the coming of drugs that are showing good results with leprosy, the medical profession will never control the disease completely until its stigma is removed from the public mind, speakers at a conference on leprosy agreed....

Eugene R. Kellersberger, general secretary of the American Leprosy Missions, declared it was time the public
learned that a leper "is not a moral delinquent and that the curse of God is not upon him, but that he is the victim of a disease which should be treated sanely and scientifically."

Actually, he observed, persons with leprosy can be released to live normal lives in society once the disease has been arrested. He laid much of the superstition about leprosy to the biblical words "Unclean, unclean," which, he said, referred to all sickness of the body as a type of sin.

Mr. Kellersberger recited many of the ridiculous effects of ignorance of the disease, mentioning the difficulties of his organization in acquiring office space and hiring personnel.

"Many people are afraid to shake hands with me because I have touched lepers," he said. (The New York Times, Nov. 12, 1950, p. 64)

XI

Our words not only influence those around us—they have an unmistakable influence upon us, too. Many of our frustrations are caused by not using the right words to define situations. I remember when my Grandpa Stroble lost his savings in a bank failure. He insisted he was "ruined." "Of course we're not 'ruined,'" said Grandma. "Nothing has happened to us. We've merely lost a lot of money." Grandpa slept soundly that night. A new definition of the circumstances had robbed it of its power to get him down. (Elmer Wheeler, "Magic Words," This Week Magazine, Aug. 15, 1948)
8. Failure of Aircraft Warning Service to Advise of Approaching Planes, 7 December 1941

The third event that might have saved the day was the following:

The aircraft warning service had established mobile aircraft warning stations on the Island of Oahu, as elsewhere related in detail, and had set up an Information Center to utilize the aircraft warning information, plot the course of any incoming planes and to advise the responsible authorities. The organization was set up and operating and was being utilized from 4 a.m. to 7 o'clock on the morning of 7th December as a training method and had been so used for some time past. The Navy was supposed to have detailed officers in the Information Center to be trained as liaison officers, but had not yet gotten around to it. In the Information Center that morning was Lieutenant Kermit A. Tyler, a pursuit officer of the Air Corps, whose tour of duty there was until 8 o'clock. It was Tyler's second tour of duty at the Center and he was there for training and observation, but there were no others on duty after 7 o'clock except the enlisted telephone operator. He was the sole officer there between 7 and 8 o'clock that morning, the rest of the personnel that had made the Center operative from 4:00 to 7:00 a.m. had departed.

At one of the remote aircraft warning stations there were two privates who had been on duty from 4 a.m. to 7 a.m. One of them was Private Lockard, who was skilled in operating the radar aircraft detector, and a Private George E. Elliott, who was the plotting man to plot the information picked up on the radar. This plotter was anxious to learn how to operate the radar, and Private Lockard agreed to show him after the station was supposed to close at 7 o'clock and while they were waiting for the truck to take them to breakfast. He kept the radar open.
for further operation to instruct his partner, Private Elliott. While Lockard was adjusting the machine to begin the instruction of Private Elliott, he observed on the radar screen an unusual formation he had never seen in the machine. He thought there was something wrong with it, as the indicator showed such a large number of planes coming in that he was sure that there was nothing like it in the air and there must be a machine error. He continued to check, however, and finally concluded that the machine was operating correctly and that there was a considerable number of planes 132 miles away from the island approaching from a direction 3 degrees east of north. The time was 7:02 a.m., 7 December 1941.

In this record Private Elliott, now Sergeant Elliott, testified that he plotted these planes and suggested to Lockard that they call up the Information Center. After some debate between them, Lockard did call the Information Center and reported to the switchboard operator. The switchboard operator, an enlisted man who testified, was unable to do anything about it, so he put Lieutenant Tyler on the phone. Tyler’s answer proved to be a disastrous one. He said, in substance, “Forget it.” Tyler’s position is indefensible in his action, for he says that he was merely there for training and had no knowledge upon which to base any action; yet he assumed to give directions instead of seeking someone competent to make a decision.

If that be a fact, and it seems to be true, then he should not have assumed to tell these two men, Private Lockard and Private Elliott, to “forget it,” because he did not have the knowledge upon which to premise any judgment. (R. 1102) He should, in accordance with customary practice, have taken initiative to take this matter up with somebody who did know about it, in view of the fact that he said he was merely for training and had no competent knowledge upon which to either tell the men to forget it or to take action upon it. By his assumption of authority, he took responsibility and the consequences of his action should be imposed upon him.
If Tyler had communicated this information, the losses might have been very greatly lessened, as General Short testified:

"If he had alerted the Interceptor Command there would have been time, if the pursuit squadrons had been alerted, to disperse the planes. There would not have been time to get them in the air.... It would have been a question of split seconds instead of minutes in getting into action." (R, 312-313)

The attack actually took place at 7:55 a.m.

When the information that showed up on the oscilloscope was communicated, apparently Lieutenant Tyler had in his mind that a flight of B-17s was coming from the mainland and he thought that they might represent what was seen on the screen of the radar machines. As a matter of fact, that probably had something to do with it, as they did come in about this period and were attacked by the Japanese, some of them being destroyed.

--Army Pearl Harbor Board Report
SN's Story

A

When I was six years old, I made a trip one cold winter night to a town about twenty miles away with my mother, another brother and sister and my aunt and her little baby. The purpose of the trip was to go to a pharmacy to have a prescription filled for the baby which could not be attained in the town we lived in. As we were returning, we were on a hill about seven miles from home when an axle broke. It was decided that I should walk to the nearest farmhouse, which was about half a mile away, and telephone my father so that he might come after us.

Being the oldest of the children, I went alone, because the ladies had to stay with the babies in the car. It was a very cold wintry night, the temperature was about twelve degrees below zero, and there was a strong wind. I was very frightened and very cold as I walked down the highway to the farmhouse. When I arrived there I found that there was no one home. In a way I was rather glad, because it gave me an excuse to hurry back to the car.

When I got back, the children were crying, and it was getting very cold. Something had to be done. Again it was decided that I should walk down the road, this time to a coal mine which was about one mile away. We were fairly sure that there was someone there all night long, so I started out again. I was very frightened and cold and I alternately ran and walked to the coal mine. When I arrived at the engine-house, I could see that there was a light inside, and I could see the old watchman sitting by the fire. I pounded on the door quite a few times before he answered. He opened the inner door and left the outer storm door fastened. I told him what I wanted as best I could while trying to
get my breath, explaining what had happened, who was in the car, where they were, that I wanted to use the phone to call my father. He slammed the door in my face and locked it and told me that no one could enter the building. I was frantic by this time and burst into tears, but he still refused to let me in, so I turned about and went back to the car. There still had been no passing vehicles and the children were getting cold and hungry.

This time it was decided that my mother and I would leave all three children with my aunt and walk to the nearest town which was about three miles away and telephone my father from there. As we came to the farmhouse that I had originally stopped at, we saw a light. Fortunately the farmer and his family had arrived home. We stopped, told him our difficulties and he very obligingly pulled us into the nearest town with his car. We telephoned my father who came to pick us up.

I didn't think too much about the incident the following day as I recall, but later on it came to mind and the more I thought about it the more angry I became, until I finally decided that if I ever saw this man again I would at least punch his nose for refusing to let me use the telephone that night. I carried this hatred on through the years, but fortunately, the old man died before I ever had occasion to meet him. It is a good thing that he did, because even in high school, when I was big enough to have done the job, I was still determined that I would if I saw him.

A few years ago in the conversation with a couple of friends of mine, the talk drifted around to this particular coal mine, and I related the story to my friends. One of them told me that he was very glad that I didn't ever get a chance to punch the old man's nose because that same old man had almost lost his life when he was beaten so badly by bandits who gained entrance to the building by asking permission to use the telephone.
Frederick M. Loomis, "The Conquest of Fear."
Coronet, July, 1949, pp. 19-21

When I saw the name of the patient listed for 3 o'clock that afternoon, I looked forward with pleasure to the visit. She had been a sweet and pretty thing when I put her first and second babies in her arms. Now, glancing at her history, I was surprised that she had not been in for a routine checkup for nearly five years. On her last visit, she had been about 35.

When she entered my office at 3 P.M., I could hardly believe my eyes. She looked not five years older, but 15. Instead of a gay smile, there was stark fear on her face. When she found her voice, she said, "I have some bad news. I just had to talk to you about it."

"Martha!" I said. "What has happened? Your husband? Your children?"

"No," she replied, "not as bad as that--just me. Remember how active I used to be? Golf, tennis, having babies and doing all my own housework besides? Well, about six months ago, when we returned after living out of town for a few years, I got short of breath on that same golf course. I began having what I thought was heartburn when I went up those hills.

"After a while I noticed that the same thing happened when I hurried to the car after I had been sitting quietly in a theater or at a lecture. And the other night Junior was so naughty that I got terribly upset. Then the heartburn came on again worse than ever--and I hadn't even moved!"

"Pain in your arm, too?" I asked.

She looked up in surprise. "Yes! And I was so uncomfortable that my husband insisted I go
to our family doctor. After I talked to him, he just listened to my heart and took my blood pressure. Said they were pretty good, but then he sent me to the hospital for an electrocardiogram. You can't guess what the specialist told me when he got the report."

"I don't have to guess—but go on," I answered.

"Angina pectoris," she said in a tragic voice. "Then he said something about spasms, but I didn't half hear, because I knew that angina meant a terrible death. At home, I looked in the dictionary and it said a painful disease characterized by a sense of suffocation in the chest." That's me, all right!

"Next day, I went back to our family doctor and he said, 'Don't fight it. You can't lick it. On your way home, get some nitroglycerin tablets—here it is written down—and put a tablet under your tongue when you feel the pain coming.'

"I haven't slept a wink since. I keep thinking about my children without a mother...."

"Did you get the nitroglycerin?"

"No," she said, "I was afraid it would explode or something. What's the use, anyway?"

I took a small brown bottle from my pocket and tossed it across the desk. "Try some of mine," I said. "I've had tablets like that in my pocket for ten years. I started exactly as you did—even thought it was heartburn. As to that word 'spasm'—it doesn't mean you are going to have fits. Your doctor said spasmogenic. That means that the blood vessels supplying the heart itself have a spasmogenic contraction after sudden exertion or too much emotion.

"Then, because the channel is suddenly smaller, the heart doesn't get enough blood for the moment and tells you so by pain. It's like a traffic
signal—when it says STOP, it means it—but like the red light, it changes pretty soon. Nitroglycerin just helps to change it more quickly by relaxing the tension in those little arteries."

"But," she exclaimed, "you can’t be serious about yourself! I can’t believe that you...and for ten years...you look so well and strong...how about those things you see in the paper every day?—dropped dead of heart disease, died in his sleep, collapsed on the golf course?..."

"Martha," I said, "I’ve been through this whole thing. Now listen to me. I gave up bringing babies into the world because I knew that if a terrific complication arose suddenly, my heart might tighten up so badly that I could lose the mother and child before I got help. It almost happened once—and that was enough.

"I also gave up quite a lot of other things that had seemed important, but I soon learned that practically every one of them could be replaced by something useful and pleasant that did not involve sudden strain. I could walk but I couldn’t chase a streetcar, and as soon as I learned that lesson I was happy again.

"If I feel the beginning of a pain, I stop in my tracks—no matter where I am or who sees me—take one of those little tablets, and wait till the light changes."

"You mean I must carry those things with me as long as I live?"

"Suppose you do? You carry a compact, don’t you?...However, there’s something else you will have to carry that’s much more important."

"What is it?" she cried.

"A little different philosophy of living, my dear. You can be a good wife and mother, and be happy too, if you stop rebelling at what you think is a ‘terrible’ fate."
Problem INT.
Irving J. Lee


My home is in Dayton, Ohio, and I was a friend of the Wright family and learned to fly on the very early Wright airplanes. Their first flight was on the 17th of December, 46 years ago. Everyone was perfectly sure that it was a crazy thing to try. The undertakers moved into Kitty Hawk with a number of caskets because they thought the Wrights would kill themselves.

When they made those first three flights on December 17, 1903, they wired their sister that they had succeeded, that they were very happy, and that they should be home for Christmas.

She thought it was a world-shaking event, so she very excitedly called a Dayton newspaper on the telephone. She rang and rang and rang. The newspaper boys were playing pinochle, but finally one of them answered.

He said, "Yes?"

She said, "This is Katharine Wright speaking," and very excitedly read the telegram.

He said, "Good. Glad to hear the boys are going to get home for Christmas," and hung up the telephone.

The newspaperman said to the others: "Nobody's going to catch me on that, because it has been proved mathematically that a heavier-than-air machine can't fly."

An inventor often has to overcome so-called "proof" or his own work may be perfectly useless.

I had a friend who was the research and development man for one of the British railroads. He came
to this country to deliver a commencement address at a technical university. After the address he came to Detroit to see our laboratories.

"Ket," he said, "when you were over in London last year you told me some things you fellows were doing with Diesel locomotives and you lied to me."

I said, "Not intentionally."

"But," he said, "you told me you were running these locomotives about a hundred miles an hour."

I said, "We are."

"And that you were taking power on the front wheels; that is, the wheels that are ahead."

I said, "We are."

He said, "I have the formulas in my portfolio that say you can't do that."

I said, "For Heaven's sake, don't let the locomotive know about it."

I said to him, "I won't argue with you at all." I took the telephone, called Chicago and got him transportation from Chicago to Denver, and flew him to Chicago to make the connection. He made the trip to Denver, where I had him ride part way on the Diesel engines.

He stopped in to see me on his way back. He was returning to England. I said, "I didn't expect to see you again. Did you ride that locomotive?"

"Yes," he said.

"Did it go a hundred miles an hour?"

"It did."

"Well," I said, "that's the reason I didn't expect to see you back. Maybe you forgot to take the portfolio with the equations in it."
He said, "The thing that amazes me is why we could be so one hundred per cent wrong."

I said, "You weren't wrong. You didn't start in right."

The two of us got out his formulas. He wasn't talking about our locomotive at all. Our locomotive uses an ordinary truck like a streetcar's. He was talking about a locomotive with a rigid frame which would normally have a small-wheel lead truck in front of it.

I said, "What's the use of using mathematics on one kind of thing and then applying it to another which is in no way related? It isn't even a second cousin to it."

We sometimes set up these limiting conditions, and they keep us from trying out experiments.

The Inventor Tries His Product

One of the great differences between the Inventor and other men is that he is willing to try the thing. In the airplane experiment, the Wright Brothers had first flown kites and had drawn knowledge from them. They finally said, "If we had an engine we could fly," and kept trying and trying until they did fly with an engine they were forced to develop themselves. They didn't care what anybody thought about it; they were pretty sure they could do it because the birds were flying.

The Inventor, in addition to having to forecast what he thinks can be done, has to overcome commercial opposition to the idea.

When we first put self-starters on automobiles I attended a meeting of the American Institute of Electrical Engineers. They asked me if I would make a little talk on the self-starter, and I did.

One fellow got up and said, "No wonder you made your self-starter work; you profaned every law of electrical engineering."
I didn't profane any fundamental laws of electrical engineering. All I did was make the starter work. Those laws had nothing whatever to do with self-starters; they were written for something entirely different.

There are fundamentals in inventions, engineering and development that are true in everything else.

As I said before, my home is in Dayton, and we have had our laboratories for years in Detroit, which is several hundred miles away. I keep my home in Ohio and drive back and forth week ends.

Some of the people who work with me also drive between Dayton and Detroit. One said, "I understand you drive from here to Dayton in four and one-half hours."

I said, "I can do that once in a while, depending on traffic."

He said, "I don't believe it."

I said, "But I do it."

He said, "I'm a much better driver than you are, and I can't do it."

I said, "I'm going down Friday. Why don't you ride along with me?"

So we rode into Dayton in about four and one-half hours, or a little more, and he said, "Hell, no wonder you can do it. You didn't stay on Route 25!"

Now, Route 25 is the red line that is marked on all the maps between Detroit and Dayton. If you are a stranger, that's the road you should take. It never occurred to my colleague that you could take any other road on either side of Route 25. There's a lot of country on either side of it; in fact, half the earth is on each side of it.

Often the biggest problem the inventor has is not in getting his apparatus to work, but in getting it to work in tune with what the public thinks at the time.
A. Averchenko, "Point of View"
This Week Magazine, Aug. 16, 1947, p. 2

"Men are comic," she said, smiling dreamily.

Not knowing whether this indicated praise or blame, I answered noncommittally: "Quite true."

"Really, my husband's a regular Othello. Sometimes I'm sorry I married him."

I looked helplessly at her. "Until you explain—"

"Oh, I forgot that you haven't heard. About three weeks ago I was walking home with my husband through the square. I had a large black hat on, which suited me awfully well, and my cheeks were quite pink from walking. As we passed under a street light, a pale, dark-haired fellow standing near by glanced at me and suddenly took my husband by his sleeve.

"Would you oblige me with a light?" he says. Alexander pulled his arm away, stooped down, and quicker than lightning banged him on the head with a brick. He fell like a log. Awful."

"Why, what on earth made your husband get jealous all of a sudden?"

She shrugged her shoulders. "I told you men are very comic."

Bidding her farewell, I went out, and at the corner came across her husband.

"Hello, old chap," I said, "They tell me you've been breaking people's heads."

He burst out laughing. "So you've been talking to my wife. It was jolly lucky that trick came so pat into my hand. Otherwise, just think: I had
about fifteen hundred rubles in my pocket, and my wife was wearing her diamond earrings."

"Do you think he wanted to rob you?"

"A man accosts you in a deserted spot, asks for a light and gets hold of your arm. What more do you want?"

Perplexed, I left him and walked on.

"There's no catching you today," I heard a voice say from behind.

I looked around and saw a friend I hadn't set eyes upon for three weeks.

"Lord!" I exclaimed. "What on earth has happened to you?"

He smiled faintly and asked in turn: "Do you know whether any lunatics have been at large lately? I was attacked by one three weeks ago. I left the hospital only today."

With sudden interest, I asked: "Three weeks ago! Were you sitting in the square?"

"Yes, I was. The most absurd thing. I was sitting in the square dying for a smoke. No matches! After ten minutes or so, a gentleman passes with some old bag. He was smoking. I go up to him, touch him on the sleeve and ask in my most polite manner: 'Can you oblige me with a light?' And what do you think? The madman stoops down, picks something up, and the next moment I am lying on the ground with a broken head, unconscious. You probably read about it in the newspaper."

I looked at him, and asked earnestly: "Do you really believe you met up with a lunatic?"

"I am sure of it."
An hour afterwards I was eagerly digging in old back numbers of the local paper. At last I found what I was looking for: a short note in the accident column:

"UNDER THE INFLUENCE OF DRINK"

"Yesterday morning, the keeps of the square found on a bench a young man whose papers show him to be of good family. He had evidently fallen to the ground while in a state of extreme intoxication, and had broken his head on a nearby brick. The distress of this prodigal's parents is indescribable."
From History of the Persian Wars by Herodotus

Croesus seeks to learn from the oracles of Delphi whether he should go to war with the Persians, and, if so, whether he should strengthen himself by the forces of an ally. Both the oracles agreed in the tenor of their reply, which was in each case a prophecy that if Croesus attacked the Persians, he would destroy a mighty empire, and a recommendation to him to look and see who were the most powerful of the Greeks, and to make alliance with them.

...Croesus a third time consulted the oracle, for, having once proved its truthfulness, he wished to make a constant use of it. The question whereto he now desired an answer was - "Whether his kingdom would be of long duration?" The following was the reply of the Pythoess:

Wait till the time shall come when a mule if monarch of Media;
Then, thou delicote Lydian, away to the pebbles of Hermus;
Haste, oh! haste thee away, nor blush to behave like a coward.

Of all the answers that had reached him, this pleased him far the best, for it seemed incredible that a mule should ever come to be king of the Medes, and so he concluded that the sovereignty would never depart from himself or his seed after him.

...Croesus is defeated by the Persian Cyrus and a great empire falls. Permission is granted to Croesus to inquire of the gods why they deceived their benefactors - their reply is as follows.... Nor has Croesus any right to complain with respect to the oracular answer which he received. For when the god told him that, if he attacked the Persians, he would destroy a mighty empire, he ought, if he had been wise to have sent again and inquired what empire was meant, that of Cyrus or his own; but he
neither understood what was said, nor took the
trouble to seek for enlightenment, he has only him-
self to blame for the result. Besides, he had mis-
understood the last answer which had been given him
about the mule. Cyrus was the mule. For the par-
ents of Cyrus were of different races, and of dif-
ferent conditions, — his mother a Median princess,
daughter of King Astyages, and his father a Persian
and a subject, who, though so far beneath her in all
respects, had married his royal mistress.
"The Attack on the Dardanelles Forts"
by Raymond Swing, The Saturday Review
of Literature, June 3, 1950

I happen to have been eye-witness of one of the most de-
cisive actions of World War I, the attempt of the Allied fleet to
force the Dardanelles in March 1915. Had this succeeded, Constan-
tinople would have fallen, Turkey would have withdrawn from the
war, the German position on the Continent would have been flanked,
and the war would probably have been won in 1916. Millions of men
who died would have lived, the United States would not have entered
the war, and there would not have been, in 1918 at any rate, the
Bolshevnik Revolution in Russia.

As an eyewitness of the attack on the Dardanelles forts—
the greatest action of naval power against land fortifications in
history up to that time—I must report that the action succeeded
and that the Allied naval command abandoned its objective not know-
ing its own success. Had the fleet come back after the first day
it could have finished reducing the forts and sweeping away remain-
ing mines and sailed triumphantly to an undefended Constantinople.
I say this because I was in the Turkish fort on the Asiatic side
of the narrows—the main defense—when the Allied attack began,
and I came back into the fort in the evening after the attack ended.
The German gunners had worked hard but their earthen defenses were
in ruins. Only two long-range guns still were usable and for these
only some thirty-five shells remained. The fort across the nar-
rows was completely wrecked, the lesser batteries down the bay
were mostly stillled. The infantry which Liman von Sanders was to
command in repelling the subsequent Gallipoli landing had not yet
assembled. The road to Constantinople was open.

But the Allied fleet did not come back and its failure to
do so is surely one of the most fateful decisions in our times.
Here indeed history was made and the destiny of Europe and America
determined. Here then is an opportunity for the historian to ex-
amine men, minds, and moments and illuminate not only how things
happened but why. But little heed has been paid these decisive
hours. It happens that Winston Churchill, author of the strategy
of flanking Germany, was to suffer the greatest loss of prestige
because it miscarried. His history of World War I also is the best
source of information about what took place aboard the flagship
Suffren of the Allied fleet the night of the first attack. In a
midnight council the Allied naval command decided not to send the
fleet back into the straits and this he relates in "The World Crisis!"

On the morning after the attack I was under orders as a
guest correspondent to be ready to retreat into Anatolia with the
garrison when the fleet returned and finished the operation of
forcing the straits. The little village of Chanak Kale was partially
in ruins; its streets were clogged with debris. The fort could only have fired an hour or so with effectiveness and all were under the depression of momentous defeat. We watched the horizon for the ominous lines of smoke and the dim silhouettes of approaching warships. But they did not come. The morning passed and our bewilderment rose. Before noon the Turkish radio picked up the London communique. This told about the attack the day before and stated that because of inclement weather it was not being resumed that day, Inclement weather! The sea was as quiet as a pond; the sky was unclouded. So we knew the fleet might not come back at all. Incredible as it was, a great victory had been won and was being thrown away.

The Allies the day before had lost three battleships. I had seen two of them slowly sinking and watched through binoculars while the boats of the Bouvet rescued part of its crew, though 500 of them perished. The third ship had sunk in the night. It was these losses, heavy under any circumstances, that dominated the night council in the admiral's room in the Suffren. As Churchill tells the story these losses were baffling. The ships had not been sunk by gunfire. The waters had been scanned by airplanes for minefields which had not been seen; hence mines were not blamed. Therefore, it was concluded, they must have been sunk by torpedoes from some hidden land torpedo station. As this station had not been found it could not be destroyed; hence a return of the fleet was deemed inadvisable. The cost of a second day might be too great to justify the operation.

This was the calculation. But it was a miscalculation. The ships had been sunk by mines. A small, deep minefield had been laid beyond the narrows by a Turkish torpedo boat two weeks before in a night expedition about which I knew, so presumably many others at Chanak Kale may have known about it. But the Allied secret service did not know and could not have had effective agents among the many Levantines in this region. That may have been no delinquency on the part of Naval Intelligence. But the failure of Allied planes to see the minefield proved to be the hub on which a momentous destiny turned. Not that the planes should have seen the minefield; that would have been impossible; it lay too deep. But at that time no one knew that a plane could not see the deepest laid minefield. It was assumed it could see every kind. This assumption, which so easily might have been tested and found false, ruled the thinking of all navies; hence the midnight council in the Suffren. If the pioneers in the use of the air arm by navies had known they could not be sure about seeing every minefield from the air, sweepers would have been sent out next morning as a matter of routine before operations were resumed and certainly before they were abandoned. Had that been done the field would have been found and then the straits would have been forced. So one may speculate about what a difference it would have made to nearly every member of the human race if some forceful enough teacher had inculcated in those pioneer airmen the homely lesson that a truth that can be proved should not be assumed to be true without proof. But this lesson was not taught,
and World War I, as historians so convincingly write, had to drag on because of geography, the equilibrium of forces, and the stubborn nature of trench warfare. Indeed, the Turkish trenches on Gallipoli held off the intrepid Allied infantry that took over the Churchill strategy after the Navy had given it up. Europe bled nearly to death in Flanders, France, and Russia before the war ended. That is history. But need it have been? Who can say?