Our "*VANISHING*" Natural Resources

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A SYMPOSIUM

NATURAL RESOURCES DEPARTMENT
CHAMBER OF COMMERCE OF THE UNITED STATES
WASHINGTON, D. C

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Round-Table Feature of the

NATURAL RESOURCES DEPARTMENT

34th ANNUAL MEETING

Chamber of Commerce of the United States

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Notes on the Speakers

RALPH L. CARR, lawyer, former Governor of Colorado, is a Director of the Chamber of Commerce of the United States and Chairman of its Natural Resources Department Committee. He is an authority in the field of the water resources problems of the Western States.

ROBERT S. KERR, first "native son" to become Governor of Oklahoma, is President of Kerlyn Oil Company, an independent exploration, drilling, and producing company with operations in eight Southwestern and Western States. His administration as Governor has been noteworthy for sound business practices. He is Chairman of the Southern Governors' Conference and a member of the Executive Committee of the National Governors' Conference.

M. L. PATTON is Vice President of the Truax-Traer Coal Company, President of the Cabin Creek Consolidated Sales Company, a Director of Appalachian Coals, Inc., and Vice-Chairman of the National Coal Association's Marketing Committee. His companies operate coal mines in West Virginia, Illinois, and North Dakota and distribute coal over about half of the country.

WM. B. HEROY, Director of Foreign Production, Petroleum Administration for War, is a well-known petroleum geologist. He has served as Vice President and Director of the American Institute of Mining and Metallurgical Engineers and as President of the American Association of Petroleum Geologists and of the Society of Economic Geologists.

N. E. FUNK, Vice President in charge of Engineering of the Philadelphia Electric Company, worked up to that position from the ranks. He is a Past President of the American Institute of Electrical Engineers.

CHARLES A. GILLETT, Forester, American Forest Products Industries, Inc., has been forester for the Seaboard Air Line Railway, State Forester of Arkansas, and Extension Forester in Arkansas, New York, and North Dakota.

W. G. BROADGATE is Technical Consultant for the Subcommittee on Mining and Minerals Industry of the U. S. Senate Special Committee to Study Problems of American Small Business. He is a mining engineer from Arizona with practical experience in various mining enterprises.

EVAN JUST, Editor of the Engineering and Mining Journal, was formerly Secretary of the Tri-State Zinc and Lead Ore Producers Association. He has had wide experience as a mining and oil geologist, both in this country and abroad.

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Introduction

By

RALPH L. CARR

Chairman

AS A TEXT for my introductory remarks I had thought to paraphrase Hamlet by injecting the "have" and "have not" idea, but on second thought, I came back to the original, namely, "to be, or not to be, that is the question." Surely no one today denies the cold fact that a nation's life depends upon its natural resources and the manner in which they are developed and used.

The danger of resource depletion has attracted the attention of a considerable portion of our people for a long time. The "happy go lucky" and the "prophets of doom" have waged their word battle in a territory almost barren of factual information for many years. Yet many, many volumes have been written about the need for conservation. The days of our forests were numbered as early as 1871. Within a few years after the drilling of Drake's famous oil well in 1859, there was talk of "waste" and "exhaustion." In 1882, when New York and Pennsylvania supplied 99% of our oil, a then well-known authority fixed the oil reserves of those two states at 96 million barrels. Yet after 60 years of continuous production, these two states produced 100 million barrels of oil in the years 1941-45 both inclusive. Even the threat of impending exhaustion has not escaped the imagination of some of the more fearful prophets.

Despite the increase in technical knowledge that has accumulated through the years, and the growing dependence upon our knowledge of consumption trends, we still have people who see nothing but disaster in the years ahead.

I would be among the last to condemn the concern that many people entertain over resource exhaustion. Much of their story stimulates thinking along the lines of sound conservation, and for that reason, it has real value. Early in the present century there was a veritable flood of newspaper articles and editorial

comments pointing out the dangers of resource depletion and the necessity for preserving our natural heritage. Let me cite such eminent conservation enthusiasts as President Theodore Roosevelt, Gifford Pinchot, J. W. Powell and R. C. Van Hise. After some years of slackened interest, public interest was again aroused in the subject of conservation under the leadership of the late President Franklin Delano Roosevelt, an enthusiast for conservation whose interest rivaled that of his famous predecessor of the same name.

Finally, we witness the shock of World War II with its terrific toll of our resources. This has brought a new flood of literature respecting the subject of resource exhaustion. It is this latest picture that we have before us this afternoon. Are we in danger of becoming a "have not" nation? This question is suggested by quoting the word "vanishing" in the title of the general topic before us. The subject is a very large one and we can, at best, deal with only a few of its aspects in the space of an afternoon meeting. For this reason we shall examine only its practical side. Practical conservation and use of natural resources depend, in the last analysis, upon the individual citizen. Real conservation must stand or fall upon his attitude, his understanding of the problem, and his willingness to cooperate. And the citizens' government is primarily and essentially the government of the state in which he resides.

The States' Interest In Natural Resources[1]

By

HON. ROBERT S. KERR

IN ANALYZING state interest in natural resources it is well to have in mind the meaning of a "state." It is defined as "a political body or body politic; any body of people occupying a definite territory and politically organized under one government, especially one that is not subject to external control."

In this discussion I shall be concerned with a state, first, as "a body of people" and second, as "an organized sovereign government."

Since people sustain life and grow through the consumption of food and water and, since food and water are natural resources, or the products thereof, and, since man is dependent upon natural resources and their products for shelter and clothing, prosperity and physical safety, and military security, it is apparent that man as an individual and as a "body politic" or "state" has a consuming and overwhelming interest in natural resources.

Man's Dependence on Minerals

UP UNTIL 100 years ago four-fifths of all the things that man used were derived directly from plant and animal life and about one-fifth from the mineral kingdom. Today, in the more progressive nations, about 70% of everything we use finds its source in minerals and about 30% are produced from things that grow.

We are however, even now, witnessing another reversal of the trend. Innumerable chemists in many laboratories "are busily engaged in the synthesis of plastics and the adaptation of artificial resins for manufactured devices of all sorts." Spurred by the fact that non-replaceable metals and minerals are being used at steadily increasing rates, they have discovered that man, through science, can develop usable substitutes from physical sources easily replaceable.

New plastics without number are constantly replacing metal

[1] Somewhat abridged from address given at the meeting.

parts until it seems certain that man's dream to develop machines constructed completely without metal will surely be realized. As this plastic revolution takes place before us we are aware that man's needs in this advanced civilization are more and more being met with products of the soil.

Yes, magic creations are also coming from water and coal and air, and while coal is a non-replaceable product, it certainly is one of the most bountiful with which the world is blessed.

Our Waste of Timber Resources

ESTIMATES vary as to how long this continent was inhabited by the Indians before the white men came, but all agree that for whatever time the American Indian may have lived here off of the natural resources of the land he turned it over to the white man in better condition than when he found it.

When the Pilgrim Fathers landed at Plymouth Rock, what is now the continental United States boasted 822 million acres of virgin forests. Today, in the same area, we own less than 100 million such acres.

Where is the timber now? What will we say when we stand before the eyes of our posterity and they ask "Where is the timber? Where is the soil? Where are the navigable waters?"

The state's interest in its natural resources has always been as keen as it is today but the need has never been so apparent. In whatever direction we look we see the results of waste, erosion and useless destruction.

On the face of our denuded forests, our scarred and eroded acres, our polluted and silted streams, many of our oil and gas fields, from which only the cream of production was skimmed and which were too soon abandoned, the hand of destiny has written the condemnation of the extravagance of this and past generations: "Thou hast been weighed in the scales and found wanting."

Need of Conservation

WE MUST, we shall, honor our obligation to ourselves and our posterity by true and far-reaching conservation. We can do no less if we are to insure the future economic security and prosperity of our own offspring.

We have a system of freedom of opportunity and private enter-

prise not enjoyed nor possessed by any other nation in the world. Can we enjoy to the full its benefits and still guarantee a heritage of freedom of opportunity and of private enterprise to succeeding generations and an environment that will enable them to enjoy an equal or greater prosperity than we have known? I believe we can.

Now we have a lot of government in this country. We have it at three levels, local, state and federal. Each has been developed to meet the needs of different generations, or changing conditions of the same generation, or both.

We prove our worthiness of the privilege of self-government by eternal vigilance and constant caution to guarantee ourselves that the good things of government are *maintained and improved*, and that the evils which can so easily stem from government are prevented or eliminated.

We need not fear any branch of our government if we are sufficiently vigilant. All three branches are creatures of the people. Each belongs to the people and each must serve the people, all of the people.

Now the people may at times look with disfavor upon one or more levels of their government but whether it be local, state or federal, each belongs to the people, and each has its necessary functions to serve, but each must be jealously guarded and guided by the people.

Functions of Federal and State Governments

IN THE MATTER of conservation of natural resources each level has a vital role to play. The federal government is of necessity primarily concerned with adequate and available supplies of natural resources necessary for the national defense. The common welfare demands that during peace we make certain not to be caught short in case of war. Where sufficient supplies of strategic materials is in the least in doubt stock piling to the extent necessary is indicated.

The national government has also a primary concern in our navigable rivers and harbors, interstate streams and highways. It has a primary concern in the insurance of adequate research to develop greater utilization of resources, in finding new supplies of known resources, and in the development of synthetic and substitute materials.

In the final analysis, however, all conservation and all utili-

zation of natural resources takes place at the local level and experience has demonstrated that the best results can be obtained by and through the state and local governments.

The federal government renders its greatest service, serves its highest usefulness, and obtains its most effective results through supporting and coordinating conservation by and through the states and their local units.

Each state has a general interest in the conservation and utilization of all the resources in the nation and a direct and specific interest in those within its own borders. Each state has a material interest and a spiritual interest in its natural and its human resources.

In order that the people in each of the states may receive the benefits of their natural resources and at the same time build a lasting economic structure, each state must honor its full responsibility to its resources and its people. Each state not only has a consuming interest in the prevention of waste but also in the encouragement of the greatest possible and most profitable utilization of its resources.

Every state has a dollar and cents interest in finding and encouraging the development of new natural resources, whether they be fuels, minerals, forests or water, or the elements of soil fertility. Each state has an interest in the encouragement and development of new industrial facilities. This dollar and cents interest is rapidly being translated into conservation and development programs, not only to conserve resources through preventing waste, but what is equally important, to promote the balanced economy which each state needs. Conservation as a theory is one thing; as a practical operation it is another and much more important one.

Conservation and Interstate Compacts

THE STATES have demonstrated vigilance and alertness in the matter of conservation. Most states have geological surveys; all have experimental stations for the development of conservation methods for soil and agriculture. All have conservation laws designed to limit the field of individual action for the common welfare. All have regulatory bodies prescribing in detail how particular resources shall be produced and to a limited extent how they shall be utilized. All have programs and agencies designed to encourage and promote the processing

of their own resources by industrial units within their own borders.

One of the most encouraging and constructive developments in state conservation programs has been the cooperative effort between states with reference to conservation within each state. Under the state and federal constitutions states may not only work together on a cooperative basis through conferences of their public officials but also with the consent of Congress they can enter into official compacts.

Prior to 1934 the interstate compact device was used primarily for the settlement of boundary disputes and for the equitable distribution of water in various Western States. In 1935 the compact was used for the first time in the field of conservation. The first such effort was the Interstate Oil Compact. In 1935 the States of Colorado, Illinois, New Mexico, Oklahoma and Texas entered into the Interstate Oil Compact "to conserve oil and gas by the prevention of physical waste." Since then Michigan, Arkansas, Louisiana, New York, Pennsylvania, Kentucky, Kansas, Alabama, Montana, Florida, Ohio and West Virginia have joined the Compact. Congressional consent was granted for two-year periods in 1935, 1937, 1939 and 1941 and a four-year period was granted in 1943.

Through the Interstate Oil Compact the member states have worked with great success towards the development and adoption of uniform conservation programs within each state and by each state, seeking to promote better methods of production and utilization of oil and gas. The Compact serves as a forum for the discussion by public officials and private citizens of every phase of conservation, prevention of waste, and greater utilization of these valued natural resources.

Since the Oil Compact was founded there have been twenty-odd other interstate compacts negotiated by two or more states with the consent of Congress. Some of these have for their purpose the conservation of resources. Several have to do with the prevention of pollution of streams; some with the prevention of floods and the storage of flood waters. These interstate compacts and the member states have worked on a cooperative basis with private industry on the one hand and with each other and the federal government on the other. They were born of the necessity for a broader conservation program and in order that the state governments may more successfully meet and discharge their responsibilities in these regards.

Federal Intervention Unnecessary

AT THE same time they have served the purpose of demonstrating clearly that federal intervention and control of the production of natural resources within the states is not necessary, and that the general welfare can be better and more fully served by and through the states themselves.

While seeking to emphasize the wisdom and necessity for conservation, I have tried to make it clear that I do not subscribe to the viewpoint of those who predict that we are about to become a "have not" Nation. I fully realize that the supplies of many natural resources are limited, but America's system of free competitive enterprise has demonstrated the ingenuity, first, to find new reserves of natural resources; second, to develop improved methods for greater utilization of our known supplies; third, to find substitute materials when needed; and, fourth, through chemical research and advances to develop such a variety of usable materials as to insure acceptable replacements long before exhaustion of any given resource.

Man has produced float valves, cable insulation, light fixtures, laminated gears, women's shoes, land fertilizers and dry ice from natural gas. He has captured magnesium and mineral fertilizers from the waters of the sea. He has secured aluminum from ubiquitous clay, and then, moved civilization forward a thousand years by releasing and harnessing limitless heat and power from the humble but universal atom.

And yet we are now and always will be vitally concerned with securing a greater degree of utilization and less waste in production. Every phase of American industry is awakened to the challenge.

Our states, each and every one of them, are constantly improving and broadening their efforts and their programs of conservation. Our states realize that the conservation of natural resources will reach its greatest efficiency through the proper development and education of our people, both young and old. Through practical and effective methods they are being taught the personal rewards and profit that can be achieved through conservation and utilization of the soil and of every other natural resource.

Coal Industries[2]

By

M. L. PATTON

BITUMINOUS COAL in reserve of supply and broad potential of use is America's richest resource. From time to time limits have been placed by experts on the reserve supply of other sources of natural resource energy, but no effectual limit has ever been placed on the supply of bituminous coal. In known deposits, sufficient bituminous coal is available to supply all the nation's fuel needs for some 3000 years; vast deposits of lignite are not included in this estimate. From the conservationist's point of view, the use of coal is evidently desirable to preserve the diminishing supply of other energy producing resources.

Coal mining began in America in 1730 in Old Virginia: 110 years later, in 1840, the annual production was a mere million tons: more than 100 years later, in 1944, we produced 620 million tons. Closely interdependent with the development of the mining industry was a like development of the tools of mining, of transportation and of the facilities for burning coal to greater advantage in industry and the home. A separate industry has so adapted mechanical tools that the nation's coal deposits high in mountains, under great land surfaces, and interbedded sometimes with slate and shale might be mined, washed, sized and treated to suit improved machinery of burning in industry and home.

As in all other industries, it required men of vision to find and chart coal deposits within wide mountainous areas and under broad plains. The development necessary to mine coal and to transport it to market required enormous sums of money, and investments were made by thousands of individual shareholders, largely based on confidence of the public in the judgment of the management that adequate coal measures were in place; that every proper care would be given to the conservation of the coal deposits by efficient mining practices; and that there was reasonable prospect at point of market for continuing competitive opportunity. Automatically, values were established

[2] Somewhat abridged from address on coal resources prepared for but not given at the meeting and address on the coal strike given at the meeting.

and investments made to support the overall giant structure of the coal mining industry, that took into consideration such factors as: coal deposits in place; the free economic opportunity to mine the coal profitably; the cost of transport; the competitive opportunity in the market; and the fundamental of the conservation of native coal supply to justify the long-pull investment.

Surpassing Efficiency in Production

THE COAL mining industry has not, over long periods, earned an adequate return to its stockholders, in spite of the fact that an efficiency in the production of coal has developed that is nowhere approached in any other country in the world. There has been worthwhile progress in research and manufacture of the facilities to burn coal in a wide range of usage. The industry is engaged in extensive research activities, calculated to improve coal usage, as well as all facilities to handle and burn coal.

We have felt it good business to promote the very best possible use of coal. Power generation required 2.4 pounds of coal to produce one kilowatt hour of electricity in 1923: now it requires 1 pound. Railroads required 122 pounds of coal per thousand gross ton miles of freight in 1920: now they require 115 pounds. Under a National Plan of Action we are undertaking to bring about better utilization of coal and improved service through cooperative effort with retail coal dealers who directly service the homes of America. All these activities directly contribute to conservation of coal and mean as well a direct loss of volume production. The coal industry has not sought to repair this volume loss by resorting to dumping prices but has rather sold its product, as to sizes and kinds, with relationship to use values of coal itself.

The important component of manpower has for many years plagued the coal mining industry and, since over 65% of the cost of producing coal is the direct cost of labor, the concern over all items of cost increases due to labor is vital.

Coal Industry's Grave Problem

A LITTLE over one year ago a contract was entered into by the operators and the United Mine Workers of America that could be reopened by either party by giving certain notice prior to April 1. The union president, John L. Lewis, demanded that it be

reopened. Conferences began March 12: almost a week of speechmaking was indulged in by union officials: no specific demands were made. Glittering generalities and sordid accusations were put to the operators' committee, which made its reply in less than one day and promptly made proposals along the lines mentioned above in an effort to prevent a shutdown. Lewis and his associates walked out of the conference on April 10, admitting that there had been no real negotiations for making a new agreement since the conference began. The miners refused to negotiate. The operators waited in vain for them to return. Why are we faced with this kind of situation? Why must this nation be constantly in a turmoil because of the power exercised by one man? The answer is that the demands, while not specific, were of such a character that the operators' committee itself announced that sane men could not agree with them.

Union Demands

What were some of these demands? First, that the coal producers of this country permit a levy, a royalty or an excise tax on every ton of coal mined. The only figure mentioned is 10¢ per ton, to be paid into the union's treasury, which would amount to over $50,000,000 annually, and would be administered by the union without any accounting to anyone. Second, that the union be given authority through its own committees to close mines down whenever they considered they should be closed, without regard to management's desires, all in the name of safety. Third, that management be deprived of the supervisory personnel—that is that all these men be incorporated into the miners' union, so that they would owe first allegiance to the union, whereas from time immemorial the coal mining industry has, like all other industries, insisted that foremen and supervisory personnel are, and must remain, a part of the management.

These demands are so far-reaching in their implications that they are almost unbelievable. Apply them to your own business, whether it be large or small, and determine if their acceptance would not cause management to cease functioning, unless by consent of a union. Should these demands ever be forced upon the coal mining industry, then all business may become reconciled to the fact that the power to tax, which is the power to destroy, has been delegated to union officials, whereas we have all understood heretofore that this power rested only in established government.

We are drifting toward a labor dictatorship in this country. This is not an idle threat.

Gentlemen, we are all faced with this problem. We are now being asked to finance the labor leaders through a taxing process exercised by the unions, on our own business, and the question is what are we going to do about it? Is the coal industry to be a guinea pig? Is the coal industry to be left to fight this battle alone? Is it not as much your fight as it is ours? Think these things over, and if you agree, then there is something that you can do about it.

The Congress of the United States should immediately take steps to outlaw such demands as royalties and forever make it impossible for another Petrillo to levy taxes on the products that you and I produce. Keep in mind that these demands, in our opinions, do not spring from the rank and file employees. They come from the union leaders.

The coal industry is interested in the conservation of natural resources, and has answered the responsibility of public trust by undertaking as best it might the things that we believe to be equitable to the millions of our people who have common interest in conservation of the nation's coal. The challenge to broad public opinion and to Government is to aid in every proper way in placing the mining industry in a position that it might in turn assume its proper share of the overall responsibility of conservation. I ask your indulgence for devoting part of my time on this important program to point out the vital issues that face the coal industry, today, and unless concerted action is taken, are likely to face all other industries tomorrow.

Petroleum and Gas Industries

By

WILLIAM B. HEROY

LOOKING BACK over the industrial and commercial progress of the United States during the last half century, the outstanding influence has, beyond question, been the growth of the use of the fluid fuels, petroleum and natural gas. At the turn of the century these fuels supplied only 8% of the energy requirements of the Nation. Last year nearly 45% of our heat and power supply were derived from these fuels. The trend which has thus been established still continues and growth in the use of these fuels is, in all probability, still well below the peak, both for this country and for other parts of the world.

Petroleum Essential for National Defense

TWO GREAT WARS have not essentially changed this basic trend; if anything they have served to accelerate it. World War II did not increase our requirements for liquid fuels alone; it demonstrated the absolute essentiality of petroleum resources to our national security. Petroleum is no longer just an important factor in our national standard of living; it is the most important single element in our national defense, and I say that with due regard to the developments in atomic energy.

Before World War II the preceding years of steady industrial growth of underground reserves of crude petroleum had been established at nearly 25 billion barrels, enough oil to cover Manhattan Island to a depth of over 200 feet. By drilling more than 400,000 wells, an efficient productive capacity of 4,760,000 barrels per day had been built up by the beginning of 1941. Crude production was about 3,560,000 barrels per day, so that productive capacity exceeded current production by 1,200,000 barrels. Refinery operations, using both domestic and imported crude, were nearly 3,800,000 barrels per day and considerable excess refining capacity existed. More than 60% of the world's capacity to produce and refine petroleum was within the United States, and we had only 4% of the world's land surface. When war came, the petroleum industry could assure the country that

no industry was better prepared to meet the demands of the global confiict.

As the United States created its war machine, requirements for petroleum products rapidly mounted to supply the increasing numbers of ships, tanks, and airplanes. In a short time it became clear that the petroleum requirements of the war would exceed all earlier expectations. Programs for new pipe lines and refineries, and for drilling more wells followed in rapid succession. By the beginning of 1945, United States' production had increased to more than 4,700,000 barrels per day. Domestic refineries were running 4,800,000 barrels per day, using nearly 200,000 barrels per day of imported crude. Production and refining in foreign countries had also been greatly increased, so that the United Nations (except Russia, which was almost entirely dependent on local supplies) were manufacturing altogether about 5,700,000 barrels of liquid products daily, of which about 1,500,000 barrels were used directly for war requirements,—nearly 25% of all oil produced.

When the fighting ceased, demand for aviation gasoline fell off almost immediately and motor fuel requirements were substantially decreased. The needs for fuel oil to operate Navy vessels and merchant ships have, however, continued at high levels. The end of the war released pent-up civilian requirements. As a result, the post-war world demand for petroleum products has exceeded all estimates. The United States is producing currently 4,700,000 barrels per day of crude petroleum, only about 200,000 barrels per day below the peak of war production. Demobilization is still in process but, when military requirements reach a post-war normal, total demands will still be substantially above the 1941 level.

Production Now Exceeds New Discoveries

IN WHAT position have the demands of the war period left the United States as regards petroleum resources? The first important element is the record of new discovery, the finding of new fields and pools to offset the decline of older producing areas. During the war, every encouragement was extended to exploratory activities, both prospecting and drilling. More geophysical crews were operated and more exploratory wells drilled than during any previous period in the industry. On the whole the results have been disappointing. While the number of suc-

cessful wild-cat wells has been large, the volume of new reserves found has been relatively small and very few new fields of major importance have been discovered. During the five year period, 1941-1945, production has exceeded new discoveries by more than 5.5 billion barrels.

Proved reserves in older fields have been added to during this period by development drilling and the quantities of new oil thus blocked out have been large, but, when effect is given to all these factors, the net result has been that the production rate has increased much more rapidly than have crude reserves. Furthermore, the rate at which reserves are being extracted has also increased. During 1940, 7.3% of the proved reserves existing at the beginning of the year were produced while, during 1945, production was at the rate of 8.5% of the initial crude reserves.

The most striking effect of the war has been on productive capacity. At the beginning of the war, as already stated, a reserve of crude productive capacity had been established amounting to about 1,200,000 barrels per day. Because of shortages of materials and manpower, development drilling was retarded during the war and, as a result, this backlog of productive capacity gradually decreased and was essentially consumed by the middle of 1944. From that time forward, some fields were produced in excess of their maximum efficient rates in order to meet war requirements. At the end of the war over-production was nearly 300,000 barrels per day.

Because such over-production, if long continued, would be injurious to the fields and would tend to decrease the amount of oil and gas ultimately recovered, efforts have been made to restore production to maximum efficient rates. It is probable that, at the present time, over-production is still about 200,000 barrels per day. Instead, therefore, of having a large excess of productive capacity as at the beginning of the war the country now has a substantial deficiency.

From the standpoint of national security our present position is far from satisfactory. The reserve of productive capacity with which the country entered World War II no longer exists. Should another war come, petroleum requirements will be far greater than in the conflict from which we have just emerged. It is essential, then, that this country develop speedily an adequate volume of reserve capacity to be held in readiness for any emergency.

Steps Needed to Build Up Reserves

WHAT can be done to provide such a reserve? May I suggest certain courses which will contribute to that result: (1) it is essential that domestic operators receive added encouragement to prospect for, find, and develop new oil resources; (2) practices which tend to waste oil and gas resources should be terminated by the enactment in oil-producing states of adequate conservation laws and by their thorough enforcement; (3) additional potential areas, such as the Continental Shelf and the Arctic slope of Alaska, should be explored and tested in the expectation that the national oil reserves will be thereby increased; (4) the development by American interests of foreign oil resources should be encouraged in the belief that production from foreign countries will again be available in an emergency; and (5) petroleum required for our internal economy which cannot be supplied from domestic sources except by over-production should be imported from foreign countries.

These measures can be taken without affront to any other nation or challenge to its security. The technical skill, specialized equipment, and capital which may be contributed to foreign oil development will increase the prosperity and raise the living standards of the countries affected and will make more petroleum products available for countries which are deficient in petroleum resources.

International Petroleum Agreements

THE United States, the world's largest oil producer, has taken the initiative in the orderly development of the international petroleum trade. An agreement to that end, signed with the government of Great Britain, is awaiting confirmation by the Senate. This understanding between the two nations which are the largest factors in the international petroleum trade should lay a foundation upon which similar arrangements with other nations can be established. It has frequently been stated that petroleum constitutes a potential source of international discord. If machinery can be set up for resolving conflicts and disputes between nations relative to petroleum resources and trade, an important contribution will have been made to the security and peace of the world.

Water and Power Industries*

By

N. E. FUNK

THE PRIVATELY-OWNED utilities over a long period of time have met the combined challenges of competition, restrictive legislation and, of late, the common woes of the war years, and have continually been able to increase their efficiency of production.

At the end of 1925, the total installed generating capacity in the United States for public supply, amounted to 23,000,000 kilowatts, with an output in that year of 65,000,000,000 kilowatt-hours. Of the latter, about 22,000,000,000 kilowatt-hours (34%) were generated by water power. At the beginning of 1945, the generating capacity exceeded 50,000,000 kilowatts, with a yearly output during 1944 of 230,000,000,000 kilowatt-hours. Of the latter figure, about 74,000,000,000 kilowatt-hours (32%) were produced by hydraulic power. Distribution of the installed capacity of 50,000,000 kilowatts showed less than 20% being operated and controlled by the various government agencies, most of which was in hydraulic plants.

In 1925, a national average of 2.1 lb. of coal was required to produce a kilowatt-hour of electricity in steam generating power plants. For the year 1944 this national average had been reduced to 1.3 lb. per kilowatt-hour, and there were numerous plants built in the last decade which were producing a kilowatt-hour for less than a pound of coal—some even as low as .85 lb. The averages reflect the equivalent in coal, in coke. fuel oils and gas where such fuels were utilized. Stating this thought in another way, it required 62% more fuel to produce a kilowatt-hour of electric energy in 1925 than it did in 1944. Further, had the energy produced by steam power in 1944 been made at the coal rate of 1925, there would have been an increase in the amount of fuel burned of over 62,000,000 tons. This information presents the picture of the size, growth and improved fuel economy of the electrical utility industry.

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* Somewhat abridged from address given at the meeting.

Research Developments

DEVELOPMENTS in power-plant equipment and improvements in performance have been due to the cooperative efforts of equipment manufacturers and the engineers of the operating companies. The ever-increasing demands of the utility companies' engineers and operators for greater reliability, increased capacity and improved performance arise from the knowledge gained through past performance of equipment when tested in the laboratory of actual operating experience. Many improvements have come directly in this way and the engineers of operating properties have had a major part in their development.

The accomplishments throughout the industry in the past two decades toward conservation of fuel and other materials have been made possible by a number of particularly outstanding basic developments. Of primary importance has been the ability to materially increase steam pressures and temperatures and to increase the speed of rotating machinery. The first has been responsible for the improvement in efficiency, and both have greatly reduced the weight of materials required, but of course, have necessitated a tremendous improvement in the quality of material used.

Metallurgical Research

Since 1925 continued studies of performance of metals for use at higher steam temperatures and pressures have produced alloy materials suitable for temperatures from 900 to 950 deg. F. In fact, a few installations have been designed for operating temperatures of 1000 to 1050 deg. F. One unit is operating at a nominal pressure of 2300 lb. per sq. in.

Plant Rehabilitation

With the availability of new materials, thermodynamic research opened another major field of improvement. Many existing plants had been installed and were operating at pressures from 200 to 400 lb. per sq. in. and temperatures from about 500 to 700 deg. F. By installing high pressure boilers and turbines, the exhaust steam from the latter could be utilized to drive the older turbines through existing steam piping kept practically intact. Installation of the new equipment, designed for operation at from 1200 to 1800 lb. per sq. in. pressure and 900-

950 deg. F. steam temperature resulted in rejuvenation of the older plant. The existing plant was thereby improved in efficiency, to an extent that permitted it to approach the economy of a new plant operating at the higher temperature and pressure.

Turbine Generators

In order to prevent operating difficulties from distortion and expansion, it was found desirable to reduce to a minimum the amount of material in contact with high pressure and high temperature steam. This called for turbine speeds of 3600 rpm rather than 1800 rpm generating units, which were the general practice for the power pressure range. Here again metallurgy was called upon, not for high-temperature metals, but for higher strength materials to withstand the forces developed in high-speed rotating parts. The larger 3600 rpm machines are less than ten years old and in addition to their lower cost, they are, in general, more efficient and, of course, use less material.

Steam Generation—Interconnection—Hydro Plants

Substantial changes have taken place in the design of boilers and allied equipment. Units for large outputs have been generally accepted, some in capacities as high as 1,000,000 pounds per hour evaporation. Boilers of 500,000 to 600,000 lb. per hour output are considered commonplace. Most of the larger boilers are pulverized-coal fired. These changes in design have also increased the efficiency of steam production, so now more energy in a fuel is converted to heat energy in the steam than was the case in 1925.

Interconnection between systems by reducing the reserve capacity required, taking advantage of diversity and permitting the operation of the most efficient plants in all systems for a greater number of hours has contributed not only to the safety of the systems so connected, but has produced a material saving in fuel consumed. Interconnection permits each system to utilize with safety larger units than would be desirable operating individually. This, together with the saving of reserve capacity, has likewise been beneficial in conserving the raw materials which go into the building of a plant.

Where it has been economically feasible, the electric utilities have installed hydro plants to supply part of their power, and

have thus contributed to the conservation of the nation's fuel supply. In 1925 the privately-owned hydro capacity was 5,600,000 kw, and in 1944 it was 8,800,000—an increase of 3,200,000 kw. In the meantime, the publicly-owned hydro plants, which had a capacity of 600,000 kw in 1925 increased 5,200,000 kw in capacity to 5,800,000 kw. As a further comparison, in the year 1944 the total energy produced in privately-owned hydroelectric plants was 41,000,000,000 kw-hrs, and that produced in publicly-owned plants 33,000,000,000 kw-hrs. This is indicative of the fact that the electric utility industry has not been remiss in utilizing hydroelectric energy where it was beneficial to the customers it was supplying.

I wish to state at the expense of repetition that improvements in steam plant economy have conserved large quantities of fuel, and, together with centralized production permitting the use of larger units, have been responsible for the conservation of other natural resources of the country.

The result of all this activity since 1925 has been a steadily decreasing unit cost of electricity to the consumer (about 60% of the 1925 cost) while in the meantime the cost of living index for the United States from the U. S. Bureau of Labor Statistics shows, despite a drop in the 30's, that during 1944 it was practically equal to that of 1925.

Forest Products Industries[1]

By
CHARLES A. GILLETT

OF THE material natural resources represented in this round table discussion, only the forests are renewable. From 1630 until the present, almost twice as much timber has been removed as existed when the original settlers arrived, although sizable stands of commercial forests yet remain. The apparent paradox of removing more timber than we had in the beginning, without exhausting the forests, is explained by the natural tendency of trees to reproduce themselves, when harvested properly.

In 1630 some 937 million acres, or about half the nation, were forested. Of this area, 828 million acres were in saw timber holding an estimated 7,625 billion board feet. In 300 years, the forest land was reduced to 630 million acres holding an estimated 1,763 billion board feet on the 460 million acres of commercial forest area. Man was not the only marauder. He cleared for farms, sawed lumber, burned wood for fuel, wasted considerable. But natural fires, insects, disease, windfalls and old age accounted for 40 percent of the total used or destroyed.

Forest Growth Approaching Drain

GROWTH is the very nubbin of the forest problem. Today we are approaching a state of balance between growth and drain, but this does not tell the whole story. A large percentage of the timber being harvested today is the finer, larger old growth—the saw timber. Much of the new growth cannot yet qualify for the jobs for which we need saw timber. The gist of the forest problem is this: Can we close the gap between growth and loss before we run out of remaining stands of saw timber? The answer is yes, providing that the forest industries, in cooperation with other interested groups including federal and state conservation agencies, put their united shoulders to the wheel.

Nothing is more important today to the enlightened self interest of our wood-using industries and the principal groups of wood

[1] Somewhat abridged from address given at the meeting.

consumers, than to assure an adequate and stable supply of raw materials within the United States. Substantial progress in industrial forestry as well as in public forestry has been made. Our timber crop is gradually increasing, but it still is not enough, especially in view of the post-war demands for lumber, paper, rayon—for almost every forest product. Our object is to maintain in production all land in the United States capable of growing a useful wood crop and not required for more important services.

Forest Education Essential

WE BELIEVE that private enterprise can provide the most effective management, use and renewal of our nation's forests but that it will require widespread and practical education of landowners in growing trees, education at the tree-roots—education both in timber growing as good business for the landowner and in the practical "know-how" of growing trees. By the same token we must create community understanding and support of timber growing in such essential respects as the control of forest fire.

Forest education is basic and essential. Therefore, the forest products industries believe in the educational approach on a sound basis to provide adequate nation-wide forest protection and to stimulate the best forest practices on all private forest lands. Real progress has been made by certain classes of industrial forest owners in a program to *Grow More Trees*. The chief problem, however, is in the small ownerships which include nearly 3,500,000 farmers and 528,000 non-farm owners. These areas comprise approximately 80 percent of all private forest lands in the United States. The State Forestry Services, the State Extension Services, the Soil Conservation Service and other agencies have made progress, but the fact remains that the surface has not been scratched and hundreds of thousands of timber landowners are yet without information as to how best to grow the maximum number of trees on their forest acreage. A good educational program can arouse sentiment among the timber landowners to a point where many will want to know how to *Grow More Trees* on their timberlands.

The forest industries recognize the sovereignty of the state and believe that within the state and its subdivisions belongs the major portion of forest conservation dealing with state and private lands. This not only includes such problems as forest

protection but also all problems dealing with forest management on private lands regardless of size of ownership.

Need Adequate Fire Protection

THERE ARE approximately 130,000,000 acres of forest land in America not under organized forest-fire control. If the United States is to meet its rapidly growing wood requirements it is vital that these areas be provided with adequate protection at the earliest possible date. It is also imperative that an intensified program of fire prevention be instituted for much of the 572,-513,000 acres which are now under organized protection. Responsibility for the elimination of fire loss rests squarely upon the people who must be brought to realize that "burned down" trees are also "burned up" dollars.

Effective state-wide forest fire prevention educational campaigns will arouse sentiment to secure sufficient appropriations to provide for adequate state-wide forest protection. It should enable the strengthening of forest-fire trespass laws in those states which need it. It should also develop sentiment to the point where justified convictions can be obtained through the courts.

As in forest-fire control individual owners cannot protect themselves against tree insect epidemics and forest tree diseases. Pest control efforts have been generally unsatisfactory because neither legal machinery nor necessary funds have been available to combat incipient epidemics. In order to protect and preserve forest resources from ravages of bark beetles, defoliators, blights, wilts, and other destructive insect pests and diseases, the forest industries believe that the Secretary of Agriculture should be authorized to cooperate with other federal departments or with any state, organization, person or agency, to conduct surveys on any forest land to detect and appraise infestations of forest insect pests and tree diseases and to determine and carry out the measures which should be applied on such lands to handle adequately such outbreaks or epidemics. The industry favors whatever federal or state appropriations are required to handle satisfactorily incipient epidemics.

Forest industries are anchored to the land which produces their needed crops of trees. Their raw material grows and through land management and forest protection, can grow forever, in endless successive crops of trees. The commercial forest lands

of America consist of 460,000,000 acres, of which 340,000,000 acres are privately owned. Thus, America's future is a challenge to the principle of traditional American enterprise. Forest industries are not only concerned with their own forest practices on 68,200,000 acres but also the encouragement of timber growing by their hundreds of thousands of wood suppliers.

Grow-More-Trees Program

TO *Grow More Trees In America* the forest industries present a three-point program to: (1) Stimulate the best forest practices on all private forest lands regardless of ownership; (2) Demonstrate to growers that good forestry pays; and (3) Seek cooperation of farmers, other woodland owners, industries and public and private agencies on a program to grow more crops of trees.

All timber landowners must be taught the basic principles of good forestry. Teaching means education. Such questions as what does it cost, how much time does it take, what skills are required, will it pay, must be answered in simpler terms so that everyone can understand. An effective tree-growing program starts in the field through the close cooperation of all groups and agencies concerned and continues in practical local publicity including country newspapers, farm press and local radio. The ultimate goal of the educational program is to make every timber landowner in America a tree farmer through voluntary action on his part at the earliest possible date.

Industrial forest ownership has been primarily acquired for the purpose of assuring a wood supply essential in the manufacture of forest products. All industrial ownerships should be placed under such forest practices that they meet the requirements of tree farms in order that they may serve as demonstrations to other classes of ownerships.

Farm and Non-Farm Woodlands

APPROXIMATELY 41 percent of the commercial forest lands in private ownership in America are classified as farm woodlands. The industry believes it is to the public interest that farm woodland owners be given public assistance in the management, manufacture, and marketing of their wood crops comparable to the assistance given in producing and marketing other farm crops and livestock.

The state forestry departments are recognized as effective and logical agencies to provide such technical services to all classes of forest ownerships under 500 acres in size. Inasmuch as this is a service beyond the educational or demonstration phase the industry believes that charges should be made on a per thousand or per cord basis. Such charges would be collected from the grower to help defray the expenses of maintaining a corps of foresters by the state forestry departments to meet such voluntary requests for services as would develop by conducting an intensive educational campaign to interest small timber landowners in handling their lands in such a way as to produce the most timber and to return the greatest income.

Between the larger industrial ownerships and the farm woodlands is another 39 percent of commercial forest lands in private ownership in the hands of approximately 528,000 non-farm owners. Their average ownership is 250 acres and the size of ownership is primarily under 500 acres. Most of the lands are held as estates, game and bird refuge farms, by small business men and as investments. Only a small percentage of the areas is under forest management. Frequently the land and the timber, or the timber alone, are sold in such a way as to result in serious deterioration of the growing stock. In many states the biggest problem is to reach this class of ownership and to interest the owners in good forestry methods. It is hoped to reach this group through a nation-wide campaign of education to *Grow More Trees In America.*

The Mining Industries

By

W. C. BROADGATE

THE MAJORITY of mining men seem to be of the opinion that true conservation of our domestic mineral resources hinges upon continued production at adequate prices which will encourage an accelerated rate of development and give proper inducement to private enterprise to make new discoveries. This today is an expensive procedure. Utilization of technological improvements also will lower costs and permit the economic extraction and processing of our considerable bodies of known marginal and low-grade ores.

Proponents of the scarcity theories have on their side the plausible and undoubted truism that when a pound of ore is extracted, that pound of ore can never be replaced in the ground. Such an oversimplification is easy to sell to the public. This statement generally is bolstered by Government figures showing "commercial ore reserves" (without definition) divided by some high rate of consumption, giving an alarmist view of the possible exhaustion of our reserves.

I want to point out that published mineral statistics are not always reliable for establishing the facts of a "have" or "have-not" position. Economic cut-off points continue to move toward lower value ores for various reasons, some of which I have already enumerated, thus increasing our "statistical" reserves. Probably only a relatively small portion of potential mineralized areas has been prospected because of the obvious limitations of the physical methods in use up to recently. It may be expected that the development of geophysical prospecting will reveal important ore bodies now covered by various kinds of overburden, and "blind" lodes which do not outcrop. Some ores, like those of mercury, are seldom blocked out ahead in any quantity and each year potential exhaustion is apparent—yet an adequate price will bring out sufficient quantities and apparently leave the reserves in no worse shape than before. Also, tax laws do not encourage blocking out or reporting large ore reserves.

Tariffs and Subsidies

THEN we must consider the serious results of depending solely on imports, or as one school of "conservation" puts it, "keeping our ores in the ground for the need of future generations." Removal of all tariff protection is an integral part of such a plan. This program obviously would discourage private exploration and development. Due to the fact that higher grade ores might be mined out selectively so industry could compete as long as possible with cheaper, imported foreign ores and metals, it might actually reduce our known "commercial" reserves. It also might encourage importers to gouge the American consumer with high prices, once our mines were shut down and no longer in competition with foreign production.

The potential use of various minerals and metals is dependent upon the technology of any particular period of our economic and scientific history. To date the number of such materials in use has increased. But there is no way of knowing whether in the next few decades shifts from one material to another may cause a mineral in the ground which today is an asset, tomorrow to be almost valueless. This possibility is illustrated by the increasing utility of the light metals and plastics. There would be no point in preserving for posterity metals or minerals for which it has little or no use. Better that we extract and use them now.

Nothing I have said should be so construed as to indicate a desire to shut off imports of metals, minerals and other strategic materials of which there may be an obvious shortage. But I think it important that our public-land policy, our tariff policy and, perhaps, a subsidy policy, be planned so as to keep a healthy, progressive domestic mining industry operating within our borders. Such a subsidy policy should be aimed at extracting marginal ores now accessible and which might be permanently lost were the mines permitted to close.

Mineral Stockpiles for Defense

A SENSIBLE national stockpile policy, such as is now being considered by Congress, would cushion us against future wartime insufficiencies. There also have been suggestions made that a supplementary "buffer" stockpile designed to stabilize supply and demand might serve a useful purpose. Such a policy should.

while not interfering with suitable acquisitions of material from abroad, favor under some "buy American" provision, the development of additional domestic sources both by encouraging discovery and aiding in improvement of the technology of extraction from lower grade deposits.

It seems to me that, entering into the picture of encouraging domestic mining is the necessity of tax-law revision which will permit the return of mining investments and adequate profits commensurate with the risks involved. Some changes in S. E. C. policy also might be helpful, although the S. E. C. probably is not as great a factor in limiting mining investment as sometimes is claimed.

Future of American Mining Industry

TO SUM IT UP, the future of the American mining industry appears to depend upon these factors, which are not necessarily listed in order of importance:

1. Tax laws which will provide inducement to invest in new mining ventures and which will permit adequately attractive returns to present and future operators.
2. S. E. C. regulations which will encourage the flotation of mining shares while at the same time giving reasonable protection to the investing public.
3. Protection from unreasonable floods of imported metals and minerals by means of tariffs, quotas, or both, planned so that domestic mining will have a fair share of domestic markets at prices which will permit mining enterprises to succeed in our high standard of living economy, without discouraging essential imports.
4. Government encouragement of marginal mining where conservation may be best served by continuous extraction, resulting in either sale or stockpiling of the production, whichever appears to be expedient at the moment. Such a program should be arranged so as to interfere as little as possible with private enterprise and probably should be accomplished by some variation of the premium system.
5. A comprehensive stockpiling law similar to that recently passed by the United States Senate (S-752), with reasonable "buy American" protection to encourage domestic private enterprise.
6. A long-range exploration program, both geophysical and physical, by the Department of the Interior, designed to add to our knowledge of potential sources of minerals, as well as continued research leading to improved mining and beneficiation methods.

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The National Picture*

By

EVAN JUST

IN UNDERTAKING to discuss national policy in regard to natural resources, I proceed in the belief that the American people are sympathetic to the fullest exercise of private enterprise. Nevertheless, regardless of the ownership or control, we who discover, develop and produce these resources must assume a responsibility to exploit them with full regard for the public interest. In our generation, if we do not accept our job as a trusteeship, the public will move in on us and take over to the extent necessary to safeguard its interests.

The discharge of our responsibility to the public requires that we conduct operations efficiently and with a minimum of waste. Waste in this sense refers to material left behind in extraction, discarded in processing, or devoted to uses for which some grosser, or more abundant material would do as well. We must further seek to make a just apportionment between the demands for current consumption and probable future requirements, the latter including both the future needs of our generation and those of posterity.

The resource problems that concern me most today refer to a small group of minerals. Well meaning but poorly informed people caused considerable public confusion over mineral conservation.

Of some minerals, we have such a plenteous supply that no interference with the normal course of private enterprise is advisable now. Also, there is a group of minerals that, however plentiful or scarce they may be, are convenient but not necessary to our economy. A third group, the "strategic" minerals, have apparent domestic reserves so small that any precautions against a national emergency should properly take the form of stockpiling.

Abundant and Strategic Minerals

IN THE plentiful category are coal, iron ore, magnesium, salt,

* Somewhat abridged from address given at the meeting.

potash, phosphates, molybdenum, limestone, sand, and construction and ceramic materials. To it I also add petroleum, aluminum, manganese, sulphur, and vanadium. Reserves of these minerals of a grade rated as commercial today are believed to be limited. However, they are supplemented by vast supplies of lower-grade material which modern technique can make available at somewhat greater cost and suitable installation of plant.

In the less essential class are barite, diatomite, fullers earth, garnet, corundum, scrap mica, and titanium. As an industrial raw material, gold is also in this class.

In the strategic group are tin, nickel, antimony, platinum, tantalum, cobalt, asbestos, flake graphite, industrial diamonds, and quartz crystal.

Uranium and thorium, the raw materials for atomic energy, present a special case. From being insignificant, they have suddenly been catapulted into a position of supreme importance. In terms of prewar economy we seem to have our share, and may overshadow all others now that a much greater value is put on low-grade materials. However, it is futile to guess about these minerals. None of us has any idea of the tonnage requirements or price levels of the future. As a component of the earth's crust, uranium is fairly abundant. With painstaking search and almost no price limits, we may find plentiful low-grade sources of production.

Limited Reserves

THE minerals which play what is rated an essential part in our current economy and whose known domestic reserves of commercial and nearly commercial grade are important, but limited, are mercury, lead, block mica, silver, zinc, tungsten, copper, fluorspar, cadmium, and chromite. The known reserves of commercial and nearly commercial grade have been estimated by the U. S. Bureau of Mines and Geological Survey to be less than a 60-year supply at the 1935-1939 rate of consumption. In quoting these figures I stress the terms "known reserves" and "commercial grade" because none of us knows or can even make reasonable guesses about our total reserves, the future rates of use, or the grade limits which progressive technology can utilize.

We are particularly in the dark as to the actual extent of our total reserves. The deposits on which we have drawn up to the

present have been principally those which have surface manifestations easily found by prospectors or by elementary applications of geology and geophysics. Sound geological reasoning tells us that a great many more have no simple surficial expression or have been covered with detritus, sediments, soil, vegetative cover, or lava flows. It is certainly expectable that at least a portion of these concealed deposits will be detected by applied geological and geophysical science, or by chance, if public policy encourages the growth of science and the assumption of risk.

Furthermore, our generation has seen but few important new discoveries, except of petroleum. Of solid minerals, the mining industry has been able to provide our consumers' needs primarily by the painstaking extension of known deposits, by improved extractive technique, and by marvelous advances in beneficiation, reduction and refining.

What is Conservation?

THE steps that a public alarmed over alleged shortages instinctively seeks to take are to sequester most of the known reserves and to discourage domestic extractive industries, on the theory that we would thus have a backlog against the demands of a future emergency. I submit that such a policy would be the most anti-conservational one we could adopt. It would cripple the industry without whose trained personnel, immense plant, and maintenance activities, a public reserve would have but little emergency usefulness. It would arrest the risk taking and technical progress by which we can expect to extend known reserves beyond our present imaginations.

Furthermore, it would condemn, possibly for all time, those low-grade reserves which are presently accessible but probably could not justify on their own account the reestablishment of abandoned operations. The reserves that will be made available for consumption by keeping a progressive industry in being, whatever they may eventually prove to be, will certainly be greater than those we can protect by a policy of "lock-up" conservation. Whenever we adopt this latter policy, then we are truly a have-not nation, both in minerals and in common sense!

In brief, the wisest conservational policy we can pursue in regard to these supposedly scarce minerals is to depend more heavily on imports than in the past, but to subordinate the rate of importation to a policy of encouraging a healthy domestic industry.

Such an industry must embrace risk-taking progressive technology, and competent management. It must contain sufficient plant and trained personnel to make an adequate nucleus for meeting the demands of an emergency. These objectives should be achieved through intelligent tax policies which encourage development, and reasonable protection by tariff or some other form of non-discriminatory subsidy.

Need Stockpiling and Intelligent Use

BEYOND the matter of conservation, let us consider the extent to which future generations will require the minerals on the critical list in order to outstrip us either in civilized progress or fiendish destructiveness. Looking over the list, I think we can conclude that most, if not all, of their applications are susceptible to substitutions, or will be, in due course. To cover the possibility that this conclusion overrates the adaptability of our future technology, an intelligent stockpiling program will certainly provide for any indispensable needs.

Therefore, I cannot get excited over the depletion of mineral resources if we adopt a sound stockpiling program and resist the pleas of uninformed conservationists who would lock up our known reserves and cripple the extractive industries. The pressing problems of conservation are those connected with soil, timber, erosion, water, and the curtailment of waste.

DISCUSSION

CHAIRMAN CARR: Thank you one and all.

We now have a few minutes which we can devote to questions and discussion, if that is your wish. I know it has been a long session and you have had a number of papers which have been concentrating several terms of training and education on these various subjects. But there may be questions in the 15 minutes we have.

Subsidies and Private Enterprise

MR. A. G. T. MOORE, *Southern Pine Assn., New Orleans, La.:* I refer to Mr. Broadgate's and Mr. Just's statements with relation to subsidies and production premiums. While business is calling upon the federal government to balance its budget, I view with alarm the continued tendencies of individual business enterprises or groups to fall for the seductive lures of subsidies and premium production payments, which, of course, is at the bottom of federal interference with private enterprise.

It has been a source of considerable pleasure to me to note that all of the speakers agree that private enterprise is the American way of doing jobs affecting our national economy. Now, perhaps it was the fault of the program makers in not including the subject, but the subject of our vanishing resources in private enterprise and constitutional rights to unnatural federal regimentation and communistic labor dictatorship was certainly well covered by Mr. Patton. I for one enjoyed his remarks, and hope that business won't do what it did when the original Wagner Labor Coal Bill was before Congress, pulled its neck in. I hope his appeal for help from business will be answered.

Need for Subsidies

MR. BROADGATE: Governor Carr, I wonder if I might answer the gentleman's remarks very briefly, regarding subsidies.

The mining industry is in a very difficult situation, in trying to establish a true conservational attitude which may require subsidies and at the same time get rid of all possible Government interference and controls.

This is a very difficult compromise to make. But might I illustrate in this way: In the Michigan copper country, for example, there are two or three old mines from which copper cannot be produced at any conceivable open-market price. As I recollect, there are about fifty million pounds of copper developed in those mines. They are very deep. If they are closed down, the plants sold, and the mines are allowed to fill up, we may never be able to recover that copper again for the national economy. The area is isolated and the copper miners in that area have been living there for a great many years. They have their own homes and farms. Several communities are completely supported from the mines.

When it was decided to withdraw subsidies from these mines in the latter part of 1945, we faced a very serious problem. Should we spend $200,000 or $300,000 in subsidies, a few cents on top of the going market price, to recover fifty million pounds of copper, and keep a complete integrated economy in that area operating; or should we just throw the whole business overboard because we were calling it a subsidy?

Figures and facts showed that the amount of relief payments, the loss in taxable valuations in several small towns and counties, the loss in taxable valuations in the mines themselves, and the loss of the mineral which probably never could be recovered because economically under ordinary conditions you couldn't reopen the mines, had to be balanced against a comparatively small amount in subsidies.

That is the condition the mining industry faces—not to force the production of metal that isn't needed, but to make sure that under a conservation program, metal and minerals which are developed, or which should be developed for the national economy, are produced. You must balance, as I say, the economic recovery in toto against a comparatively small amount of outlay. It isn't precisely the same situation as with agricultural products where you may have a continuing subsidy from year to year on materials which can be grown or not grown as the farmer wishes. With metals, after the situation has developed to a certain point, you must recover them or, frequently, lose them. I think Mr. Just will substantiate that situation to a large extent.

Types of Subsidies

MR. JUST: Yes, if I may, I would like to add certain clarifying statements on principle.

First of all, I think there is considerable confusion of what a subsidy means. To my mind, tariff is essentially a subsidy of domestic production in the direction of producing self-sufficiency. I am a farmer. I have a farm in Oklahoma. The Government will pay a substantial part of the cost of putting fertilizer on that land. They will compensate me for improving the soil by the planting of forage crops and of similar things. They will even compensate me if I let the land lie fallow instead of planting it to wheat.

The statistical efforts that the Department of Commerce makes to help business are a subsidy in the same sense. The dredging of rivers and harbors is a subsidy to transportation in the same sense. Are we so pure about this subsidy business that we, for example, are ready to abolish tariff and throw industries, which have been leaning on this crutch for a hundred years in various degrees, adrift all of sudden? I think if we examine what subsidy really means, we will find that we have to compromise on that statement, that even the most radical free enterprisers of us have to see that subsidies, to a considerable extent, are necessary to protect the public interest in resources.

MR. MOORE: If I wouldn't be infringing on your time, may I have one more minute? It is an historical fact that each applicant for a

subsidy has a lucid explanation as to why it ought to be granted. Nevertheless, when we accept from the hand of the master, soon the master is master of us. It has worked out that way.

I don't advocate abolition overnight of subsidies, but I do advocate the return to the American principle of anti-subsidy, gradually if necessary.

MR. JUST: Well, we have had tariff for a hundred years, and I don't see any terrific concern over that. I can't differentiate between a non-discriminatory subsidy that is direct and a thing like tariff.

Conservation by Technology

MR. EUGENE HOLMAN, *President, Standard Oil Company of N. J.:* May I make an observation touched on by Mr. Just and Mr. Broadgate, and also by the Governor briefly. I think it very important and that all the natural resource industries should highlight it wherever possible. This is that competition really comes within the natural resource industry through technology. I think we ought to do more toward highlighting the technology, for, after all, technology is the multiplier of our natural resources. While the various gentlemen who spoke touched on it briefly here and there, I think the Natural Resources Committee of the Chamber and the Chamber itself should devote as much attention as possible toward highlighting that particular phase of natural resources.

I happen to be in the oil business. We consider ourselves dispensers of energy in the form of gasolines and fuel oils. So far, the best way that we have found to make them, the cheapest way and the most efficient way, has been to make them from crude oil. We think that, looking down the road for quite a long way, that will continue to be the best way to do it. However, we recognize our national responsibilities to the extent—I think this is generally true in the industry—that our primary responsibility is to be sure that the customer receives the energy in the form that he wants it.

Now, technology plays a very important role in that particular situation. For example, we are continually finding, developing new methods of multiplying our resources in the sense that we can make gasoline, if and when necessary, from coal. This would entail costs so that the average consumer in the United States would probably pay ten cents a day more on his gasoline bill if he used gasoline made from coal rather than from crude oil. The point is that technology is the thing we should highlight, and that is really the crux, I think, of a great many of the natural resource industries.

Forest Taxes

MR. J. R. THOMAS, *Treasurer, Montana Power Company, Butte, Mont.:* I have a question: Mr. Broadgate mentioned taxes. I would like to explore the views of Mr. Gillett as to the influence of taxing policies on the forest products. I would like to ask him if his organization hasn't

made recommendations as between property taxes on timber products or severance taxes?

MR. GILLETT: Our organization is primarily interested in the public relations phase of growing more trees. But I might say, as far as the property taxes are concerned, that most of the states have taxes per acre on forest lands that are not exorbitant. However, some of the states are commencing to pass laws to provide for paying the tax at the time of severance. I believe the United States Government itself will bear so much tax at a known figure, we might say a dollar an acre, and then, when the forests are harvested, a severance tax is collected at that time.

Subsidy vs. Tariff

MR. LAMMOT DU PONT, *Chairman, E. I. du Pont de Nemours & Co., Wilmington, Del.:* I wanted to make an observation which perhaps will help Mr. Just to get straightened out on the difference between a subsidy and a tariff. According to my view, a subsidy is paid out of taxation by the people as a whole. A tariff is paid out of the price of the goods and is ultimately paid only by the user of the goods. A tariff is paid by the user of the goods, a subsidy is paid by the nation as a whole.

MR. JUST: I would certainly accept that qualification without any dispute, only remarking that the consumers are substantially the taxpayers, by and large.

MR. DU PONT: That is not quite correct, but, putting it in a little different way, a subsidy tends to increase the use of an article, because it makes the price lower to the consumer. A tariff tends to stifle the use of the commodity because it tends to make the price higher. It has a different economic effect entirely.

Coal Conservation

MR. JAMES FRANCIS, *President, Island Creek Coal Co., Huntington, W. Va.:* Mr. Patton, to my mind, covered a very essential subject for this meeting. Coal is not vanishing very rapidly. It is being subjected to a great many costs right now. This past month, it spent a shut-down expense more than its last year's earning. That means a waste, because if you are shut down in coal mining, you leave a great deal of the most inaccessible coal and you lose it permanently. The type of thing that is being done to the coal industry now is causing waste.

The coal industry furnished this nation during the war 2,500,000,000 tons of coal, did it without any Government subsidy or any Government loans of any consequence. The coal industry, as Mr. Funk says, helped save sixty million tons by giving better coal, better sized coal, and helped those plants use the coal. If we had been on the same basis of consumption we were on in the last war, it would have required nearly 300,000,000 tons more coal to have done the work of the coal that was used last year, had the coal industry not improved its processes and if industry hadn't improved its burning techniques.

Conclusion

CHAIRMAN CARR: I just want to say this: For a good many years a group in this country has contended that our natural resources are being depleted toward the danger point, where we will become, as individuals and as a nation, bankrupt. There are others who take exactly the opposite viewpoint.

In this field of debate, which has gone on ever since I was a youngster, there has been very little information. Our desire here today was to bring together men from a great many sources who would give us some information and some facts on which we could stand in our future consideration of the subject of conservation.

Conservation is a most noteworthy thing. Sanity, going along with anything, helps somewhat. Now, as Jim Francis has said, there are conditions which are the exact opposite of conservation, which may deplete one of our natural resources. I wish that we might have had a whole day for these discussions. A great many questions might well have been asked and answered.

We are grateful to all of you for your efforts in presenting these statements. We are grateful to all of you who came and particularly to those of you who stayed. The Department of Natural Resources expresses its appreciation to each and every one of you.

YOUNG FOLKS
DO SOMETHING
BE SOMEBODY

BETTER LIVING THROUGH FARM IMPROVEMENT

BE SOMEBODY

Do Something Useful
Grow the Best That's in You

Don't Be a Weakling
Don't Be Shiftless
Don't Expect Something for Nothing

Many of the pictures, particularly of contest winners, used in this book are furnished through the courtesy of the National Commitee on Boys and Girls Club Work of the 4-H Club.

BE SOMEBODY

Amount to Something

YOU are a new combination of possibilities in the world. Your job is to discover your worthwhile possibilities and make them count for something for yourself and for those about you. What possibilities are worth while? How can you go about it to discover and develop them?

This book aims to help you a little in answering these questions. HELP—that's all any book, any friend, any teacher, any parent can do—the rest is up to you.

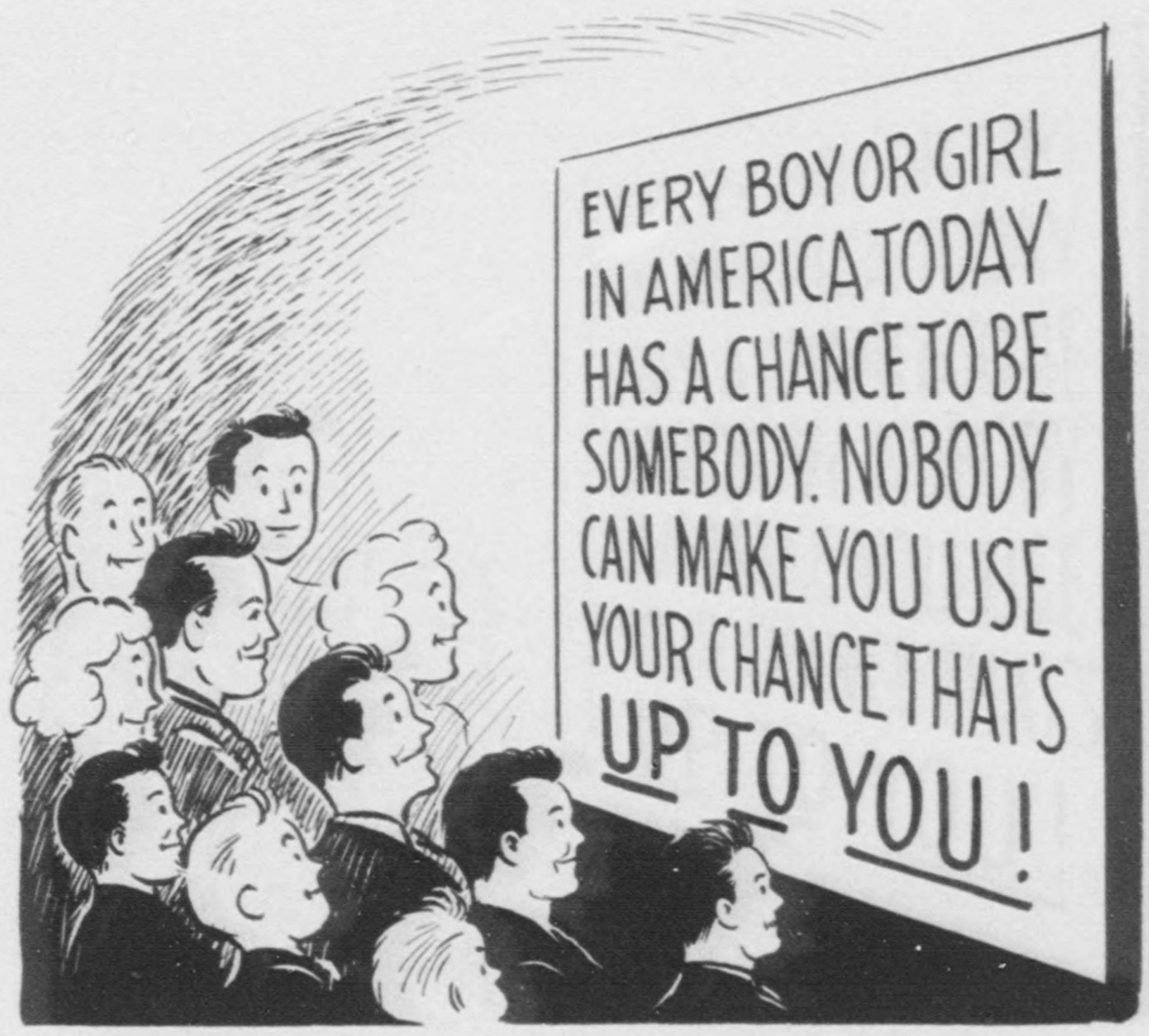
You don't need to hold a big job in the world to be a HUMAN SUCCESS. Birth or accident may put into high positions folks who are rather "small potatoes" as human beings, but the world sizes up their HUMAN QUALITIES about right. More and more folks are being judged not by what they own but by WHAT THEY ARE and WHAT THEY DO.

If we could throw on a screen the picture in the minds of the fathers and mothers of successive generations when they have spoken the words at the top of this page, we would have the history of the ideals of the race.

In detail these pictures vary greatly. The urge toward something better is always with us. New knowledge comes. New inventions are made. Conditions change. Thoughts and habits of folks change. Ideals change.

To have ideals that hitch up with things and folks as they are and then to translate these ideals into our working schedule of everday life is the way to grow the best that's in us.

EVERYBODY HAS A CHANCE TO BE SOMEBODY



In order to be somebody, you must do worthwhile or useful things. That's the only way you can exercise the best possibilities in you and give them a chance to grow.

Success in life consists in making the most of the best that's in you. In finding the place where you can best develop your powers, you will find your greatest happiness.

The easy life is seldom the happy life and never the most useful life.

WORTHWHILE FOLKS GET THE MOST OUT OF LIVING

The world needs worthwhile folks and in the long run pays the highest rewards to worthwhile folks.

Good behavior works out happier than bad behavior. No intelligent middle-aged upright man or woman would change places with the ignorant, the loafer, the weakling, the drifter, the criminal.

Many of us will find our place of greatest usefulness in the common ordinary fields of activity. Nobody is more uncomfortable than the man who is thrust into a big job without being prepared to handle it.

The best way to prepare for something better is to put a great deal of thought and energy into the activities of today.

HOW TO TELL WORTHWHILE FOLKS

First. **By the way they look—APPEARANCE**
Second. **By what they say —WORDS**
Third. **By what they do —ACTS**

Our appearance, our words and our acts indicate **WHAT WE ARE.**

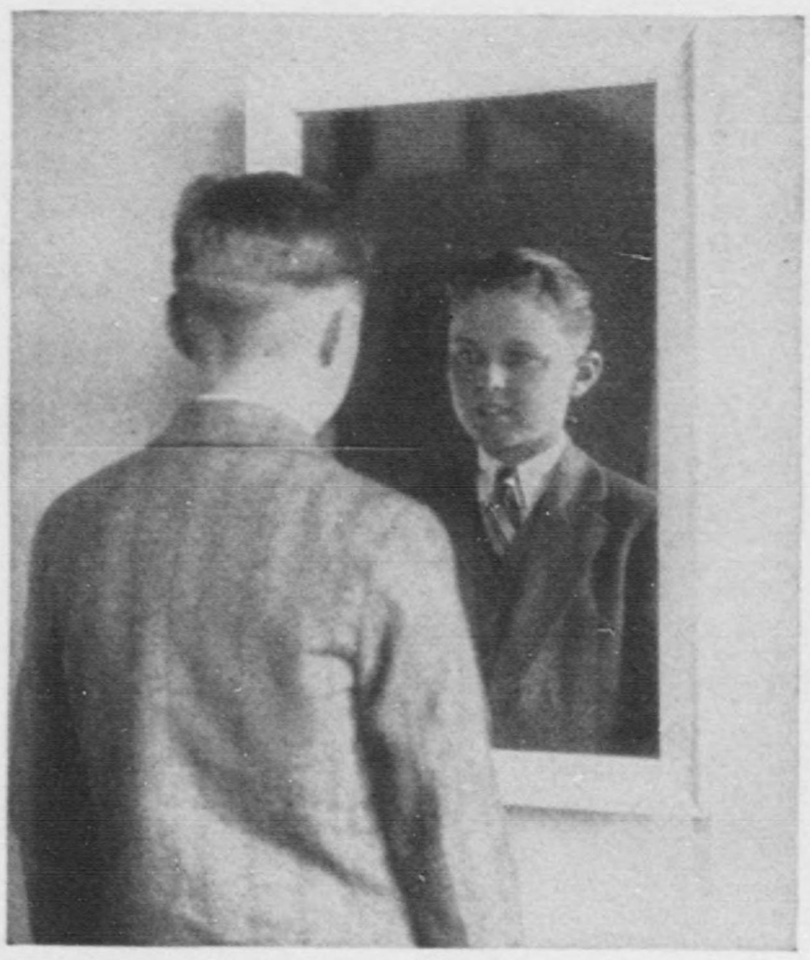
Folks may fool us by their appearance; they sometimes fool us by their words; they seldom fool us by their acts. **"Actions speak louder than words."**

One thing is sure: **The forces in us express themselves in many ways.** When we think we are fooling the world, we are only fooling ourselves. By the time we are fifty, what we are is pretty well written in our faces.

"WHAT YOU ARE SPEAKS SO LOUD THAT I CANNOT HEAR WHAT YOU SAY."—*Emerson.*

"Mysterious girls, when you are fifty-two, we shall find you out; you must come into the open then. If the mouth has fallen sourly, your's the blame. All the meannesses your youth concealed have been gathering in your face. But the pretty thoughts and sweet ways and dear, forgotten kindnesses linger there also, to bloom in your twilight like evening primroses."—*J. M. Barrie.*

TAKE A LOOK AT YOURSELF



Right now is the time to start being somebody.

Are you doing anything useful now?
Are you clean, neat, thoughtful?
Are you a hustler or a dilly-dallier?
Are you happy or do you grouch?
Have you faith or are you easily discouraged?
Do you play fair or do you cheat?
Are you on the square with yourself?
Do you plan or do you drift?
Are you discovering and developing the best in you?
What sort of somebody are you now?

Worthwhile folks don't just happen. You aren't born worth while; you are born only with the possibilities of becoming worth while. Your job is to discover and develop the man or woman you ought to be. "Sooner or later we sit down to the banquet of consequences."—*R. L. Stevenson.*

HOW'LL YOU LOOK FORTY YEARS HENCE?

Day by day you are making this picture.

Who will you be?
Where will you be?
What will you be doing?
Will you be useful?
What will your associates think of you?
What family will you have?
What friends will you have?
How will the generation then growing up regard you?
Will the best in you now be developed then?
Are you growing now the sort of somebody you'll like to be forty years hence?

Thousands of plump little seeds of worthwhile things and shyly ambitious little growths toward worthwhile achievements wither and die from neglect. Every generation has a good crop of human fizzles, but it's the human successes of each generation that move human life forward.

WHAT'S HIS FUTURE?
Depends Much on His Start

If you are a normal boy or girl, you have many possibilities.

Which possibilities you'll develop, what chances you'll have to develop them to the limit, and how well you'll improve your chances, cannot be foretold.

One thing is sure: The sooner you begin finding your possibilities and developing them, the better. The chances you'll have tomorrow depend much upon the way you use the chances you have today.

What you are today you made yesterday. What you will be tomorrow you are making today. You are a growth by law and not just a creature of chance.

A good start means a lot, whether we are growing plants, chickens, pigs, or folks.

THESE YOUNG FOLKS HAVE BEEN BUSY DISCOVERING AND DEVELOPING POSSIBILITIES

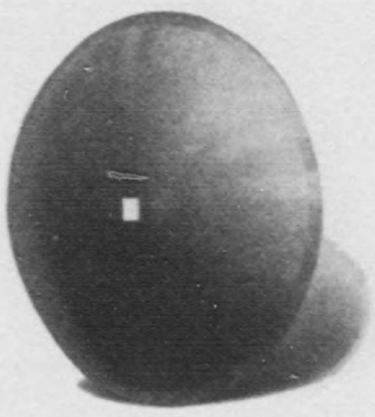
Award winners in 4-H Club national dress revue.

National 4-H Club health champions.

National 4-H Club achievement champions.

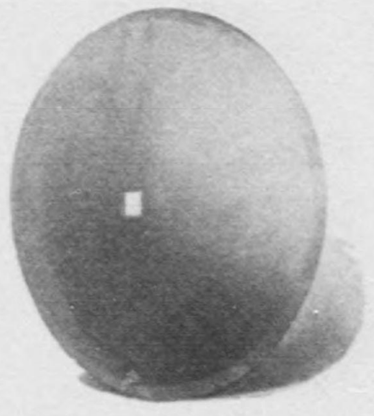
QUALITY COUNTS

It Shows Up When We Get Into Action



This worked O. K. when harrows were always horse-drawn and there was little strain or shock.

These harrow disks look alike, but they are different. One has been hardened and toughened by heat-treatment. Field service under modern farm conditions reveals the difference.



This stands the daily gaff of modern power farming under all kinds of field conditions.

We can't be simply good; we have to be good for something. A motor, "running smooth" while it is idle, gives but little indication of its value. The buyer asks: "What will it do when the clutch is in?"

"What's in you?" "What have you done?" "What can you do?" "How do you hold up under strain?" "How do you weather a crisis?" "Can you hold a course whether the going be easy or hard?" These are the kind of questions put to folks.

Action is the test of living. **A life that is action-tested from youth possesses a fine, strong, rugged fiber that never develops in a lazy, effortless life.**

The quality you are growing into your life today will determine the quality of your living thirty years hence.

Folks judge you generously now while you are young. "Give him time to find himself," they say, or "He may arrive yet." However, by the time you reach middle life, they'll expect you to be doing your share for your home, your community, your generation.

What we WANT
What we THINK
What we DO

These determine the quality of our living.

QUALITY COUNTS

We Can Grow It Into Our Lives

Little desires—little power.
Little thinking—little things.
Puny efforts—petty results.

Big desires—lots of power.
Big thinking—big things.
Hearty work—generous rewards.

We all **WANT** the things that we think will make us happy. We want to own things, to know about things, to go places, to do things, to work out ideas, to win the esteem and respect and affection of folks. The bigger our wants, the more chances we have of being worth while. The person who cares for nothing amounts to nothing. We begin wanting on the day we are born. When we quit wanting, we'll be dead. **IF WE DON'T WANT ANYTHING, WE ARE HOPELESS.**

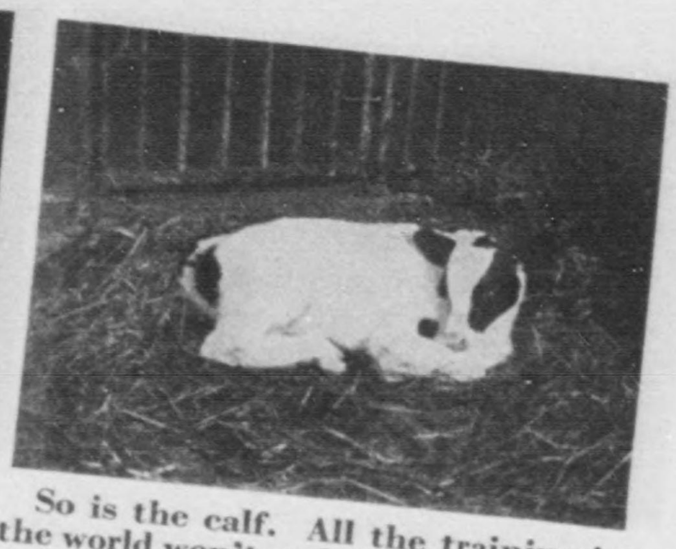
If we don't **THINK ABOUT OUR WANTS,** we let little desires crowd out the really big, worthwhile desires. "I didn't think," is the excuse most often given for acting foolishly, recklessly, dangerously, selfishly. Unnecessary accidents and needless griefs follow. Thinking helps us to see where to go and shows us how to get there. It clears the way for resultful action. **IF WE DON'T THINK, WE ARE RECKLESS AND SELFISH.**

In order to make our feelings and thoughts count, we must **WORK TO GET WHAT WE WANT.** The more times we get good ideas, backed by strong feelings, and do nothing, the worse off we are. Doing things tests our thinking and our feeling and enables us to do clearer thinking and work out happier things the next time. Better make a mistake than to do nothing. **IF WE DON'T DO ANYTHING, WE ARE HELPLESS.**

To grow quality into our lives, we must learn to direct our wanting, our thinking, and our doing, so that we get worthwhile results.

HEREDITY IS IMPORTANT IN MAKING US WHAT WE ARE

We are born with certain characteristics, tendencies, and impulses.



So is the calf. All the training in the world won't make a white calf red.

It's foolish to deny a difference in heredity. This would be a mighty uninteresting and unprogressive world if folks were all born with exactly the same looks and the same abilities. There are many kinds of work to be done to keep the things in this world of ours moving on and forward and it takes different types of ability to get this work done.

It's foolish to waste time wishing you could change the color of your eyes, the shape of your nose, the size of your feet. Spend your time on the things about you that you can change, shape, or direct.

It's foolish to criticize your endowment; study it; make the most of it. Discover your strong points and build on them. Admit your weak points, if questioned about them; at all other times, forget them; don't emphasize them by talking about them. Overshadow them by building stronger in other directions. If defects can't be remedied, learn to live comfortably with them.

You wouldn't have the inclination or the ability to read this book, if you didn't have a lot of good points in your heredity.

Every normal baby has enough strong points in his make-up to build a worthwhile life. Blaming the Lord and blaming heredity are two of the lazy, shiftless ways of shirking responsibility for what we are and what we do.

TRAINING IS IMPORTANT IN MAKING US WHAT WE ARE

As a calf grows, it develops habits—habits of eating, habits of going to and coming from pastures, habits of answering calls, habits of calf-living. Owners condition or train calves.

As we grow, we develop habits—habits of eating, habits of sleeping, habits of working, habits of feeling, habits of thinking, habits of living. Parents and teachers condition or train children.

If we feel a certain way very many times, we get the habit of feeling that way. If we think along a certain line very many times, we get the habit of thinking that way. If we do a certain thing in a certain way very many times, we get the habit of doing it that way. **It's not a question of whether or not we'll form habits. It's a question of whether or not the habits we form will help or hinder us in living.**

We are finding out that there is not as much difference in heredity as some folks would have us believe. Many short-comings which have been blamed upon heredity are due to faulty family habits. There has been **no training**, or **bad training.**

Training is important. A wild calf from a Western ranch has no chance to win the prize in the show-ring when placed beside the well-conditioned, well-trained calf owned by a 4-H Club boy. Fortunate are the boys and girls whose parents and teachers do a good job of conditioning or training them—

BUT

Blaming the early training given us or our lack of training is another lazy way of shirking responsibility for what we are and what we do. If we know enough to know that something was wrong or lacking in our early training, we know enough to START RETRAINING OURSELVES.

USE YOUR HEAD—THAT'S WHAT IT'S FOR

Think About Your Wants

A calf is dependent—it can't think out better ways of living. We can *think*; we can *imagine* different and happier ways of living; we can *test*, by our own experience and the experience of others, the ways which are most successful; we can *choose* which ways we'll follow; we can *train ourselves* to follow the ways we choose.

Instincts and habits are strong. They bring things up to us on our blind side. Few of us do much thinking until there is a conflict between wants. Raising our wants to the level of consciousness gives us power in directing our activities.

Habits rule much of our living. The older a habit is, the stronger is its rule over us. We begin forming habits the day we are born; when we have lost the power to form new habits, we'll be old.

Most of the things we do every day we turn over to habit—standing, walking, talking, chewing food, writing, etc. The ability to turn so much over to habit leaves us free to think and plan about other important things.

Good habits save time, protect health, and aid happy, useful living. They clear the way for the best that's in us to express itself.

Bad habits waste time, injure health, and hinder happy, useful living. They block the way for the best in us to express itself.

Thinking makes clear to us what we can't change and what we can change; thinking enables us to weigh the value of our various wants; thinking shows which habits are helpful and which are harmful; thinking makes it possible for us to give up old ways and grow new ways; thinking opens up opportunities; thinking makes it possible to train or retrain ourselves.

Many of us shrink from the effort of thinking. We are too sluggish to investigate; too timid to face conflict; too lazy to train ourselves. Afraid-to-think people or too-lazy-to-train-themselves people never travel very high roads in life.

"As a man THINKETH in his HEART, so is he."

WE HAVE MANY WANTS

It Takes Head-Work to Organize Them

We find in ourselves all sorts of wants. Some of them are born in us; some are acquired from our family and friends.

It's HUMAN to select soft, lazy, selfish, short-sighted ways of living. It's ALSO HUMAN to select big, generous, beautiful, comfortable-in-the-long-run ways of living. It's EVEN MORE HUMAN TO SELECT THESE BETTER WAYS, otherwise we'd still be savages fighting day-by-day battles in the forests.

Here are some of our more important wants:

To feed ourselves.
To be comfortable—have clothes, homes, conveniences.
To avoid danger.
To mate.
To collect and own things.
To know about things—how things started—how they act—what they really are.
To travel—go places—be active.
To play—relax—have a good time—be happy.
To gain affection, respect, esteem.
To accomplish things—work out ideas—be a force or power in affairs.

Wants pull folks in many directions. The desire for food sets most people to work; it leads some people to steal. When danger appears, some people run; others fight. The wish to mate makes most people lovers and home builders; it leads others to be cheap philanderers or perverted, selfish gold diggers.

Even within the same person, one want pulls this way and another pulls that way until one hardly knows which way to head. Sometimes two distinct wants pull so hard in opposite directions that two distinct opposing habit-systems are built up. Then, as in the famous fiction case of Dr. Jekyll and Mr. Hyde, one person becomes "two somebodies."

Different crowds and different circumstances affect our wants. We may be one sort of somebody at home, another sort at school and still another when out with the gang.

Wants in themselves are neither good nor bad. **How we harmonize our various wants with each other and with things as they are is the all-important thing.**

Are we wanting something there is a chance of getting or are we like a child crying for the moon?
What is the price of what we want?
Is it worth the price?
Are we willing to pay?
Do we want too much or too little?
Can we work with others to get what we want?
Do we hurt or deprive others to get what we want?
Can we make decisions about our wants?
Will getting what we want help or hinder our growth?

To be "somebody" we must unify and direct our wants so that they lead along useful, happy ways of living. Habit soon makes us like whatever ways we follow.

LEARN TO DIRECT YOURSELF

Don't Follow Just the Want of the Moment

Lost. If he'd just use his head and study the guidepost, he'd find help.

The person who is always dead sure of his way hasn't traveled very far, but a traveler, who can't or won't read the guideposts he finds along the way, gets unnecessarily confused and lost. There are many guideposts that help young folks to find the on-leading roads.

Any one old enough to read this book has traveled part of his way in living. Many of his habits of feeling, thinking and doing are formed.

Our **parents** start us on our way.

Teachers and schools help a lot in establishing our ways.

Our **friends and companions** greatly influence our ways.

As we grow older, we visit new places, meet new people, find ways of living that conflict with ways we are in the habit of following.

Often we needlessly handicap ourselves by carrying, all along the way, bad habits we've fallen heir to or have picked up from shiftless companions.

Effortlessly following the want of the moment may be interesting for awhile but, at best, it is mighty uncertain as to results. **Your ways or habits of living must be the kind of ways that you and your friends can tie to and live with comfortably through the years.**

Here's the big point: **You have the POWER OF SELF-DIRECTION; the job of growing up is the job of learning how to direct your feeling, your thinking, and your doing. Feeble-minded folks never grow up. Like children, they always have to be directed.**

MAKE DECISIONS

Drifting is Uncertain

"Choose"—That's a good word. It implies that we've **thought** about our **wants** and made a **decision.** Life is a continual process of making choices. A person who can't **make decisions** is unfortunate—he's pulled hither and thither by his wants until he can't bank on himself and no one else can bank on him. **We quit drifting when we think about our wants, make choices, and back up our choices with result-getting habits.**

To every man there openeth
A way, and ways, and a way,
And the high soul climbs the high way,
And the low soul gropes the low,
And in between, on the misty flats,
The rest drift to and fro,
But to every man there openeth
A high way and a low
And every man decideth
The way his soul shall go.
—From "All's Well." Doubleday, Doran & Co.

"The greatest conflicts are waged, not with swords and guns on the fields of battle, but in the hearts of men."

HAVING STANDARDS MAKES DECISIONS EASIER

A standard is a guide which serves as a basis for making decisions.

A teen-age girl took her place at a lunch counter. A waitress handed her a menu and stood waiting for the order. Before even looking at the menu, the girl said "Milk and—," following this with a brief look at the menu, then giving the rest of her order. This girl had standardized one item of diet. Having this standard helped her to make a speedy, sensible selection of food.

We have standards in nearly all work-a-day affairs of life. Standards take guess-work and confusion out of our dealings with others. Business, as conducted today, would be impossible without well-established standards. Standards relating to human qualities are called morals.

Standards grow out of experience. We have "common sense" standards before we have scientifically accurate standards. Housewives had cups and spoons and successfully exchanged recipes long before standard measuring cups and spoons and standard recipes were devised.

Standards change, but underlying principles do not change. Foods change, but the principles of nutrition remain the same. Morals change, but the human quality of morals remains the same. What is fair in settling a transaction today may be quite different from what would have been considered fair a century ago, but the quality of fairness is the same.

More clearly defined standards are necessary today than formerly. Many more choices are open to us. In food selection, unless we have some guiding principles of nutrition, we can make mistakes now which our grandparents dealing with a more limited variety of foodstuffs could not make. We can go so many places, do so many things, and make so many social contacts now that unless we have some guiding principles about successful ways of living, we grow confused and make more tragic mistakes than could have been made years ago.

Standards make decisions easier.

Standards speed up life by taking out moments of hesitancy.

Standards aid in crises and help to avert accidents by assisting us to make good choices when we are too excited, or too weary, or too crushed to think straight.

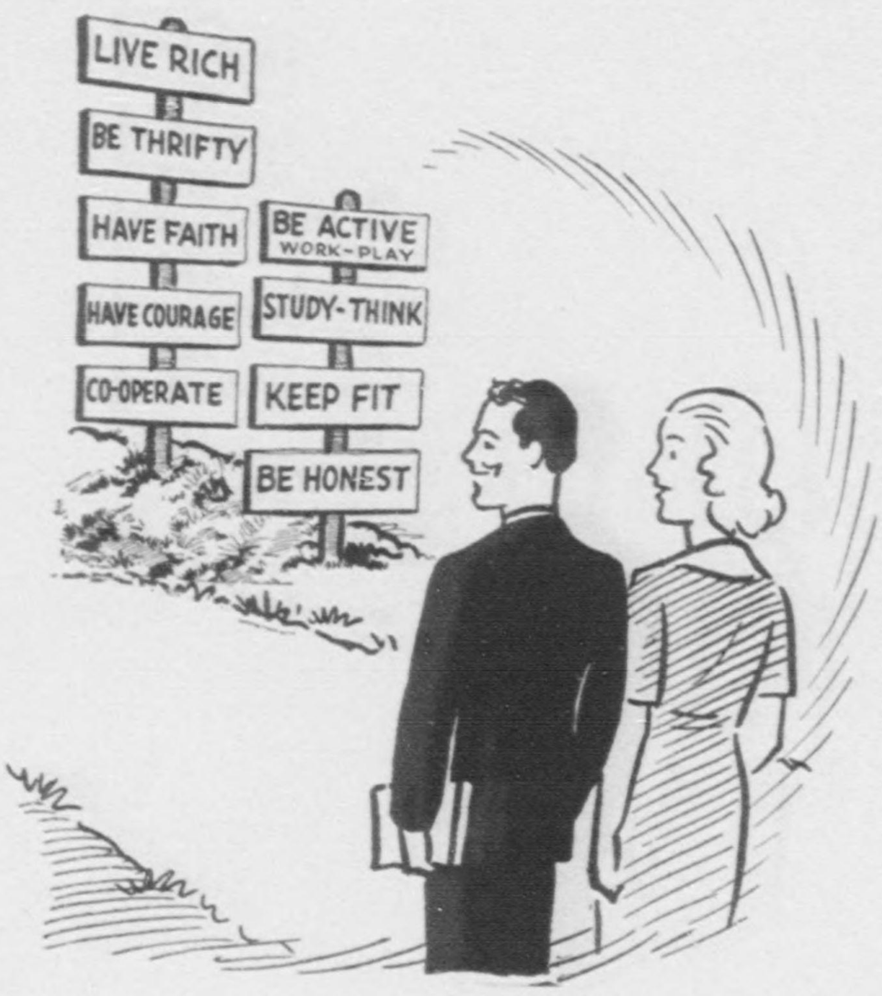
Standards help to prevent drifting, for without standards we are a prey to every influence that touches us.

We acquire moral standards just as we acquire food standards. We get our first standards at home. As we grow in experience and knowledge, these standards are changed and modified.

It's not a question of whether or not we'll have standards; it's a question of whether the standards we have are hit-or-miss, acquired-by-accident standards or whether they are standards which will bear the test of present-day knowledge and experience.

We need to check our standards continually. To have standards and not be standardized is a fine art, but it is the art of living.

GUIDEPOSTS ON FORWARD-LEADING ROADS



An enthusiastic, energetic boy or girl without some well-established high-quality standards is like a high-powered machine with a faulty steering gear and poor brakes. No one is a safe driver until he has his driving habits so well established that almost automatically he does the right thing to control his car.

A standard is not really yours until you acquire the **habit of applying** it instantly and without argument or excuse-finding. Argument never settles anything and excuses only indicate weakness.

The often-used excuse, "They all do it," is a thought-dodging, afraid-to-stand-on-your-own-feet thing to say.

CULTIVATE YOUR VISION TO SEE

Decisions are worthless unless they head you in the right direction. That takes a knowledge of things as they are and some anticipation of the road ahead.

Find out what others have done. Folks who have successfully traveled a road can always give valuable advice about the way. There are many successful folks about you. It's foolish not to consult them.

Study yourself. We are not born equal. Our gifts are not all the same; our abilities vary. Specialize on your strong points. Find out, not only what you can do best, but also where what you can do best "fits in" best. Make yourself above the average in at least one line of endeavor. It's the above-the-average person who helps most and reaps the best rewards.

See ahead. Don't be shortsighted. Don't let little right-now, this-minute wants crowd out entirely the big, worthwhile, desirable-in-the-future wants.

Be open-minded. Face facts squarely. Don't think you know it all. Learn from as many things and folks as possible. Be willing to learn from anything or anybody. An open-minded attitude makes living more interesting and opens opportunities.

Don't regret what you can't do. You can't have everything you'd like to have; you can't go every place you'd like to go; you can't do everything you'd like to do. Make decisions and then don't waste your time regretting what you can't do. If you are clear about your wants, you'll stand a better chance of succeeding. A successful life depends a lot upon what you leave out.

Live rich. Joy in living springs from the feelings. Take a little time each day to cultivate the heart things. Learn to appreciate the "green things growing," the flow of water, the song of birds; read a poem each day or a human-relation story; listen to some music; get acquainted with the folks about you; take time to make friends. While we can be expert in doing only a few things, we can enrich our lives by learning to appreciate many things.

The law of compensation. If we are blind, we develop a keen sense of touch. If we are lame, we have more time to read and think. If we do shallow thinking, we miss the great truths of life. If we don't like folks, we miss the joys of friendship. If we won't work, we get little pay. The greater the service, the greater the reward. **The more we put into life, the more we get out of it.**

A decision is only thinking things through. It takes determination to work things through. Decision is the starting force; determination is the sticking-to-it power.

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DEVELOP YOUR ABILITY TO DO

The world judges you and pays you not for what you decide to do but for what you do. Dreams don't count until they begin to work themselves into reality. Knowledge is power only when it is set to work.

Think why and how you are doing things. Don't just drudge along. DOING SOMETHING and BEING ALERT WHILE DOING IT is a sure way of getting knowledge.

"We learn to do by doing" is only a half-truth. We don't learn much if we just mechanically slave along. Good eyes, keen ears, and capable hands are your tools for getting knowledge. Use them.

Start now. Time is the stuff of which life is made. Don't dilly-dally. If you dilly-dally at your jobs now, you'll get the habit of dilly-dallying. "Do the duty that lies nearest to you." It's the boys and girls who work hard at home who are sure to make the best records when they go away from home. Doing small things well at present prepares you for doing greater things in the future. Opportunities are coming to you NOW. How are you meeting them?

Adjust as you go along. You'll make some wrong choices. Everybody does. Conditions may not be what you thought them to be. Conditions may change. If you keep alert and are not too set in your own little notions and ways, you'll learn a lot as you go along. Fit yourself to life. Don't try to make life fit you.

Don't expect something for nothing. Work for what you want. No amount of talent or no amount of influence will carry you very far unless you work. An accident may put you into a responsible position, but nothing but fitness will hold you there. "It never will rain roses. When we want more roses, we must plant more rose-bushes."—*George Eliot.*

Profit by the criticisms that come to you. If you do nothing, you may evade criticism. If you keep on doing nothing long enough, you will be criticized for your inactivity. Don't let criticism, even if it is unjust, anger you. Don't let it discourage you. Study your criticisms. Dig out the kernel of truth in them. Criticisms are frequently valuable guides.

Be a finisher. Persistent people often begin their success where others end in failure.

Consider others—cooperate. You must live and work with others. Others must live and work with you. Your affairs are all tied up with the affairs of others. The bigger your job in life, the more folks you'll have to know about and work with. You can't do much working alone. The pleasures that we share are best.

The highest compliment that can be paid to a person is that he is a man of vision and a man of achievement.

YOUR SERVANT OR MASTER

"I am your constant companion, I am your greatest helper or your heaviest hindrance.

"I will push you surely forward to success, or I will drag you down to failure. It is as you will.

"I am completely at your command. Half the tasks that you do, you might just as well turn over to me and I will do them quickly, correctly, and without bother. Yes, or I will leave them undone, and let them hang on your neck like a curse. IT IS AS YOU WILL.

"I am easily managed. You need merely be firm with me. Show me JUST EXACTLY HOW YOU WANT THINGS DONE and, after a few lessons, I will do them automatically.

"IF YOU DON'T SHOW ME, I SHALL NEVER LEARN, AND THE MORE YOU GIVE ME TO DO, THE QUICKER THE WRECK WILL COME. You see, I have not sense of pride. I know myself and I am square with you.

"I am the trusted servant of all successful men. Yes, and alas, equally the servant of all failures. Those who are successful, I made successful. Those who are failures, I made failures. That was not my fault. It was theirs. I build or destroy. It is all one to me.

"I am not a machine. But I work with all the precision of a machine, plus all the intelligence of a man. **You may run me for profit or run me for ruin.** It makes no difference to me.

"Take me, train me, be firm with me, keep me in the right direction, use me, and I will put THE WORLD AT YOUR FEET. Be easy with me and I will destroy you.

"Who Am I?

"I AM HABIT"

—From a Northwestern University Leaflet.

We can't have men and women of vision and achievement unless we have boys and girls who are in the HABIT OF SEEING THINGS AND DOING THINGS.

BUILD UP RESERVES

Good bankers and good businessmen know there must always be a "reserve" of money available for use in emergencies. Without a reserve, banks would go broke. Folks, the same as banks, go broke if they try to just "get by."

Even the smallest bank must have a reserve; the greater the responsibility of the bank, the greater must be its reserve.

You can't live daily just on the edge of your power or ability. Safety lies in having a margin of reserve. In every active life there comes a time when this reserve is called upon to carry through the task at hand and get the desired results.

A reserve is built up little by little. It is the result of wise planning and good management.

Youth is the time for laying the foundation of reserves.

Build reserves in:

Power to do things—by good work habits.
Knowledge—by good observation and study habits.
Health—by good food, sleep, posture, and exercise habits.
Money—by good earning, spending, saving, and investing habits.
Character—by adopting good standards and living up to them.
Rich life—by profitable and interesting use of leisure time.
Friends—by being kindly and sociable.

The cumulative effect of a DAILY interest in any good thing of life is tremendous. Many of us understand this CUMULATIVE EFFECT in regard to money better than we understand it in regard to some other good things in life.

GET INTO ACTION

Just moseying along—has nothing — going nowhere — dreamy — indefinite. Dreaming is O. K., but it ends in uselessness unless it is backed by work and tested by things as they are.

Knew what he was after—got it—knows where he is going—purposeful —definite. The bigness of this job will depend upon whether he learns to think how things are done or just drudges along doing them.

One thing is certain, if you don't do anything you can't find out what you can do. Your powers are left undiscovered and undeveloped. Your standards are left untested. Your judgment remains immature.

Don't wish you were somewhere else. Don't envy somebody else. Don't imitate somebody else. Don't wish other jobs were your jobs. Work at the job you have and find out how it leads to a bigger and better job.

Your next step must be taken from right where you are with things as they are. Your chores, your little money-earning jobs, your lessons, your club work—these are your tasks now. You can't shoulder future responsibilities if you won't shoulder present responsibilities.

Get acquainted with the things about you and learn from the folks you see every day. If you don't get that habit now, you won't learn from the folks and things about you ten years from now. Most of us have to find our way as we go along.

When Lincoln was reading books by the light of a log fire, he didn't know he would be the president of our country during one of the country's most critical periods. He just kept on splitting rails and reading books, doing the things right at hand the best he knew how to do them.

This trait of doing the best he could under the circumstances served Lincoln well during his presidency. In one of the dark hours he bolstered up the courage of his associates by saying, "I reckon if we do the best we can as we go 'long, we'll come out all right in the end."

There are more folks who fail to succeed because they fail to start, than there are folks who fail to succeed because they haven't the ability to carry on.

AIM AT PROGRESS—NOT PERFECTION

The first reaper.

A modern combine.

If the inventor of the reaper had waited to vision a modern combine before building a reaper, we'd still be cutting our grain with a sickle.

If the corn breeders had waited for a perfect type of corn before starting to breed corn, we'd still be using Indian maize.

Donkey trails preceded railroads; railroads are supplemented by air-routes. All these means of transportation are still needed in some places or in some seasons of the year in order to get people from where they are to where they want to be. If we should want to build a railroad station at the North Pole, we'd have to start laying the track from where we are and we'd have to use the material that is available.

We must follow the same tactics in making social progress. All the good things of today have had small beginnings at some time in the past. The good things of today may be out-classed in generations soon to come.

None of us can see the end from the beginning. All we can do is to work and keep heading in the right direction. If we are alert, usually the end is O.K. However, an accident may happen for we are not living in a perfect world. A failure in a bit of work or in an experiment is not a failure in living. It's often only a starting point toward something better. There is a saying: "If you fail often enough, you'll finally succeed."

HERE IS A GOOD MOTTO FOR CHECKING UP ON PROGRESS:

"This day I will beat my own record."

Not the other fellow's record, but my own record. This keeps us critical in judging ourselves, but kindly in judging others. When folks reach the stage where they think they are perfect, there isn't much hope for them. Perfect folks are apt to be harsh in their estimate of others.

WORK MAKES ACHIEVEMENT POSSIBLE

Achievement Builds Self-Respect

A handful of blue ribbons standing for achievement in 4-H Club work.

Work and play are both good, but they are different. Work, more than play, makes achievement possible. It enables us to hold our own among our fellows. It gets what we stand for across.

It's hard sometimes to draw the line between work and play. Some people like their work so much that they "play at it" after work hours. Others "work so hard at playing" that they are worn out and bring no energy to their work.

Play adds to the richness of life. Things done in the spirit of play have a good flavor. It would be fine if we could always work in the free, abandoned spirit of play. Some people do.

We can't accomplish much, though, without overcoming obstacles. This means that we must have the ability to stick to a job. It means that we must have the courage to tackle physical and mental hardships. Work, more than play, trains us in these qualities.

When we take work out of life, we soften it—we take out the bony frame-work that supports it. People who try to build their lives without work are like the early breeders of Poland China pigs. They bred for such small bone and fine quality, that in a short time, they didn't have much pig.

Most folks enjoy their work or at least they enjoy the results which they can accomplish with the money earned. The word "work" sounds mighty good to any self-respecting man out of a job. Watch the "happiness barometer" go down when jobs are scarce.

Through work we find out our strong points and our weak points; through work we learn to express ourselves fully and freely; through work we get ourselves and what we stand for across to others; more important still, through work we get ourselves across to ourselves.

THE WORLD PAYS FOR SERVICE

Service Means Effective Work

Timeliness is an important element of service. There are about 360 days when it is a waste of material, time, and labor to spray an orchard, but there are four or five days each year, when, if you don't spray, you'll lose all, or most of your crop.

The world needs workers and pays for service. Service is made up of several things.

The service must be needed.

What is done must be fit and appropriate.

It must be done at the right time.

It must be thoroughly done. A power spray is better to use in the orchard than a hand spray, because it reaches the top of the tree and applies the spray with force enough to count. A lot of work is ineffective because just a little more force is needed in order to put it over.

There must be no wasted energy or material. Shooting the spray mixture high above the tree-tops wastes both fuel and material. You can't succeed without work, but work in an easy way. Anyone is foolish not to figure out the easiest and cheapest way to get hard tasks well done.

Anyone who does thoughtful, honest, persistent work in any line of endeavor soon makes himself an authority in his field. At some time, he will be called upon to be a leader or a teacher of others.

Drudgery is not necessarily good work. In fact, it is often extremely inefficient and renders very poor service. The world doesn't like drudges. It calls for folks who enjoy their work. We make an improvement whenever we replace blind, unaccomplishing drudgery with thoughtful, enjoyable, result-getting work.

Work ceases to be drudgery when we think why and how to do things in order to give the most effective service. The same task may be drudgery to one person and healthful, uplifting work to another. Much depends upon the vision and motive of the worker and his attitude toward his work.

BE ALERT FOR NEW IDEAS

Make the Most of Your Experience

The factory man, sharpening the section blades of a mower knife, isn't doing little thinking or poor work if he keeps in mind the idea of these knives in place on a machine and giving good service to a farmer in the field.

The farmer mowing alfalfa in the field does big thinking if he is able to follow his alfalfa through all the feeding and marketing processes that give the factory man's family high-quality meat or milk or butter or eggs.

We all want as much money as we can get for the work we are doing, but the person who tries to see how little he can do for the money he is getting defeats his own purpose.

Whether or not your work is interesting depends more upon you than upon the work. **Delve deeply into any process and you'll find a lot of the world clustering about it.**

Study your job and find out where it fits into the scheme of things. One of the best ways to chase monotony out of a job is to think of what you do in terms of the folks you are being paid to serve.

Keep on the lookout for opportunities in your job and for new ideas about your work. Some one has said, "We have great big six-cylinder brains, but run on four cylinders most of the time."

Get ideas from all sources:

Be a good observer.
Make contacts and ask questions.
Do a little purposeful reading about your work daily.
Think over what happens—get the value of your experience.

DON'T BE LIKE PAT

A farm owner was taking his Irish poultryman through a well-equipped poultry house on an adjoining farm.

"Pat, why don't you make some of these things?" said the farm owner. "Don't you have the time?"

"Oi, sure, and I have the time, but not the ideas," replied Pat.

SOME HABITS THAT HELP TO MAKE WORK EFFECTIVE

Her thoughts are miles away from the task at hand—she's only fooling herself into thinking that she is studying.

Twenty minutes of concentrated, thoughtful effort accomplish more than hours of dreamy, dissipated study.

Get down to work quickly. Have the things you need for work arranged so that they are easy to get and don't spend too much time fussing and fidgeting around getting set.

Concentrate. Settle down to business. Dig in. Work harder, but not so long. Three square feet of ordinary sunshine, **concentrated to one point, will melt a hole in any metal.** The same law applies to human effort.

Keep up with your work. Getting behind and wondering whether you can catch up gives a breathless feeling that is not conducive to best results.

Do little things well. Don't expect to hold a big job without mastering the detail that leads up to it.

Don't be afraid you'll not get credit for what you do. Get your work done and folks will size you up about right. A lot of detail men think they are not getting credit for the work they do, when, if facts were broadcast, they couldn't do anything if it were not for the master mind directing the work.

Develop initiative. Try to see what the next step will be. If you are good at finding this out, you'll have the ability to direct others and some day the chance may come.

Don't carry your work into your play. Good workers are usually good players. Concentration is the secret. When you play, give up your mind to it. That gives real relaxation from the work you have been doing.

"I know what pleasure is for I have done good work."

—Robert Louis Stevenson.

PROFIT FROM THE LESSONS OF THE PAST

Learn from Experience of Others

A good stiff *forward* punch is started by throwing the body weight backward and drawing the arm back as far as it will go.

If you know something about what went on in the world before you lived in it, you'll be in a better position to move yourself and your generation forward.

If you know what folks have done in the past, you are better able to judge the present, and map out a good course of action for the future.

That's why it pays to study about the world you live in.

That's why a knowledge of history, biography, and literature gives you a good background for living.

That's why talking things over with your fathers, mothers, teachers, and older friends helps you in making your decisions.

That's why it pays to consult experts in farming, business, law, or banking before starting new ventures, signing leases or notes, or making investments.

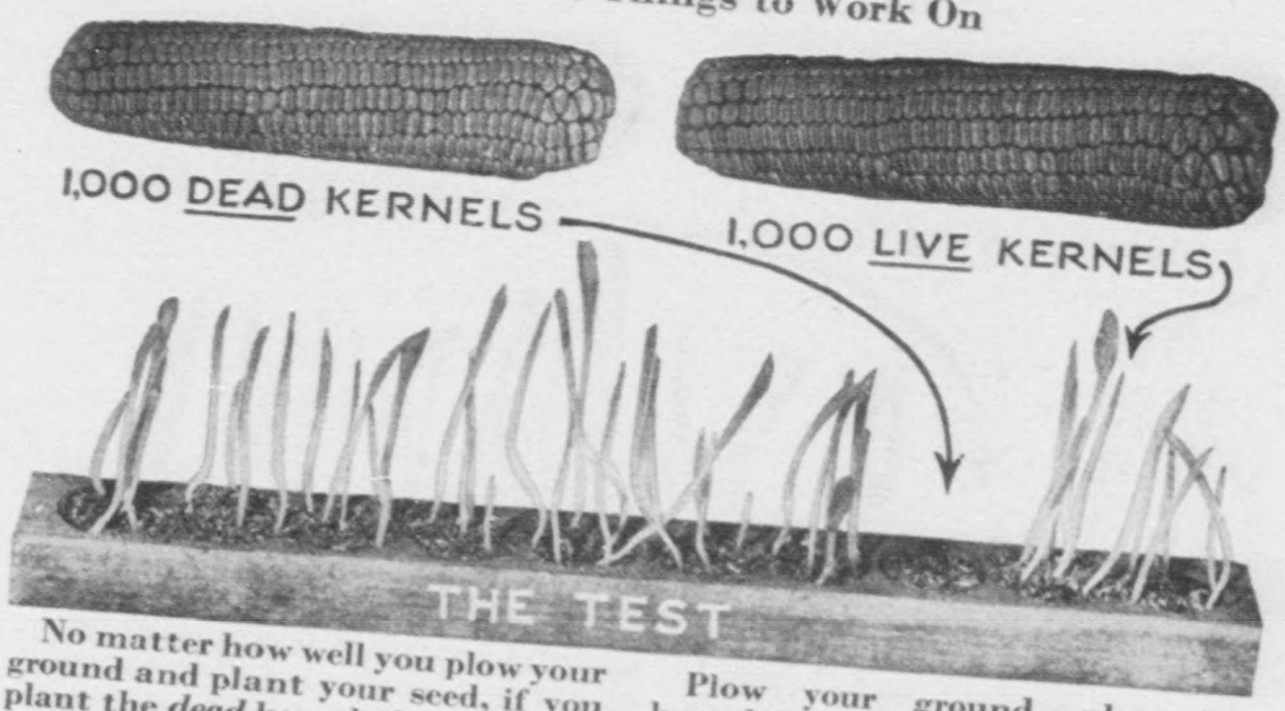
Personal experience is a good teacher. There is none better, but learning through your own experience is awfully slow. You won't get far unless you learn to take advantage and profit by the experience of others. A knowledge of the past will help you to understand the present and predict the future.

That's why folks who spend time in preparation go farther than those who jump in with a wild splurge.

Study the past only to get a good running start forward.

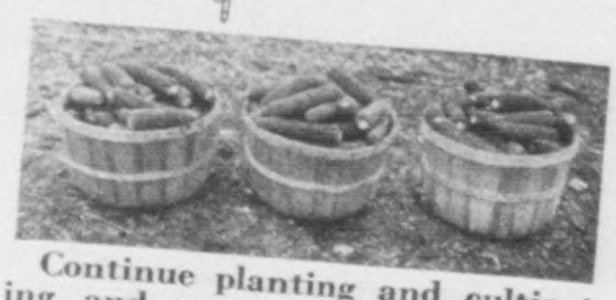
FACE THE FUTURE

Select Live Things to Work On



No matter how well you plow your ground and plant your seed, if you plant the *dead* kernels from the ear above, your harvest will look like this

Plow your ground, plant *live* kernels such as in this ear, carefully cultivate the crop, and you'll harvest about



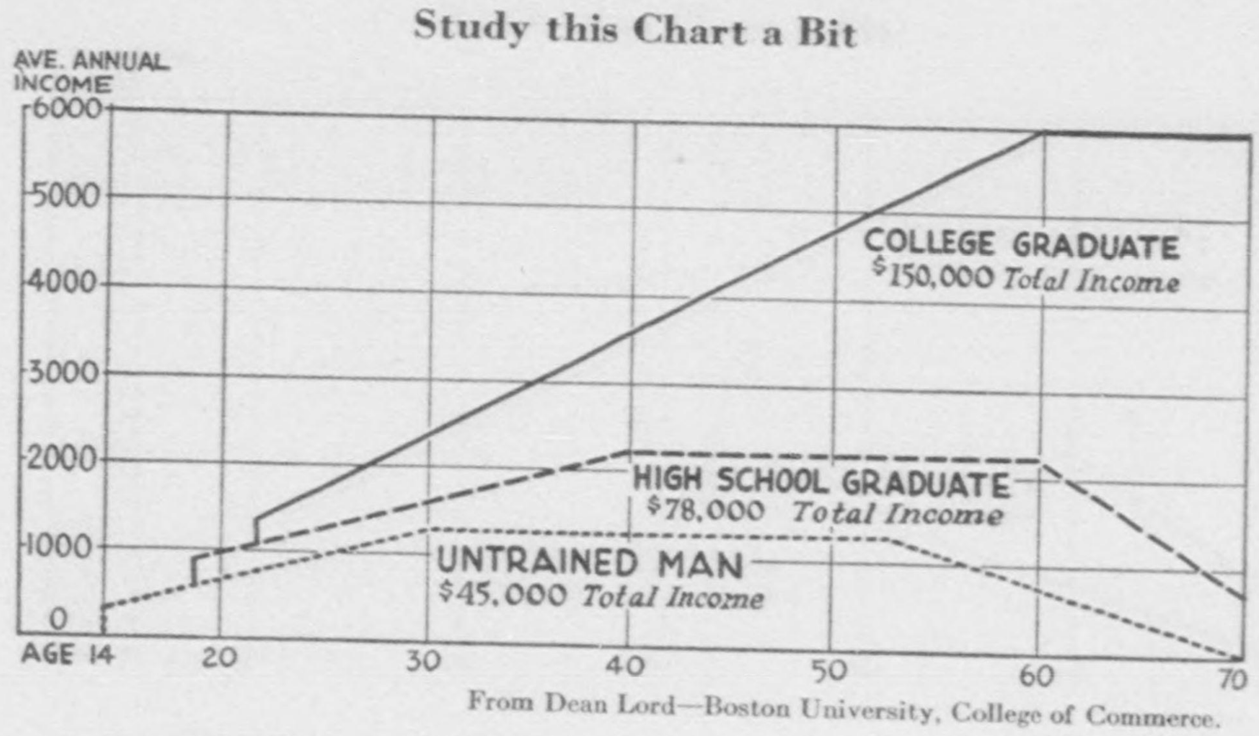
Continue planting and cultivating and next year there's something like this

One of the biggest factors making for success in a job or in any undertaking of life is the ability and vision to select growthy things upon which to work—things which mean something to this generation and to the future. Coddling and trying to kindle into life something that has served its day and its generation is a hopeless and thankless task.

Concentrate on forward-leading issues.

SCHOOLING PAYS

Study this Chart a Bit



From Dean Lord—Boston University, College of Commerce.

This chart shows the value of an education in terms of the amount of money earned in a lifetime.

The untrained man (eighth grade or less) can hope to earn $45,000 between the ages of 14 and 60. He reaches his greatest earning power at the age of 30; at the age of 50 his earning power grows less.

The man with a high school education can expect to earn $78,000 between the ages of 18 and 60, or $33,000 more than the untrained man. He reaches his greatest earning power at 40 and maintains this power until he is 60.

The college graduate can expect to earn $150,000 between the ages of 22 and 60. His earning increases steadily until he is 60 years old.

These figures are based upon the earnings of thousands of people and are as nearly accurate as can be found.

There have been many men who have made great successes of life without much schooling, yet few of these men would claim that their lack of schooling was a factor in their success.

Of all men who are considered wealthy, there are 277 college men to one non-college.

In one industrial plant, college men rose to foremanship in three years, while it required eight years for the untrained man to reach the same position.

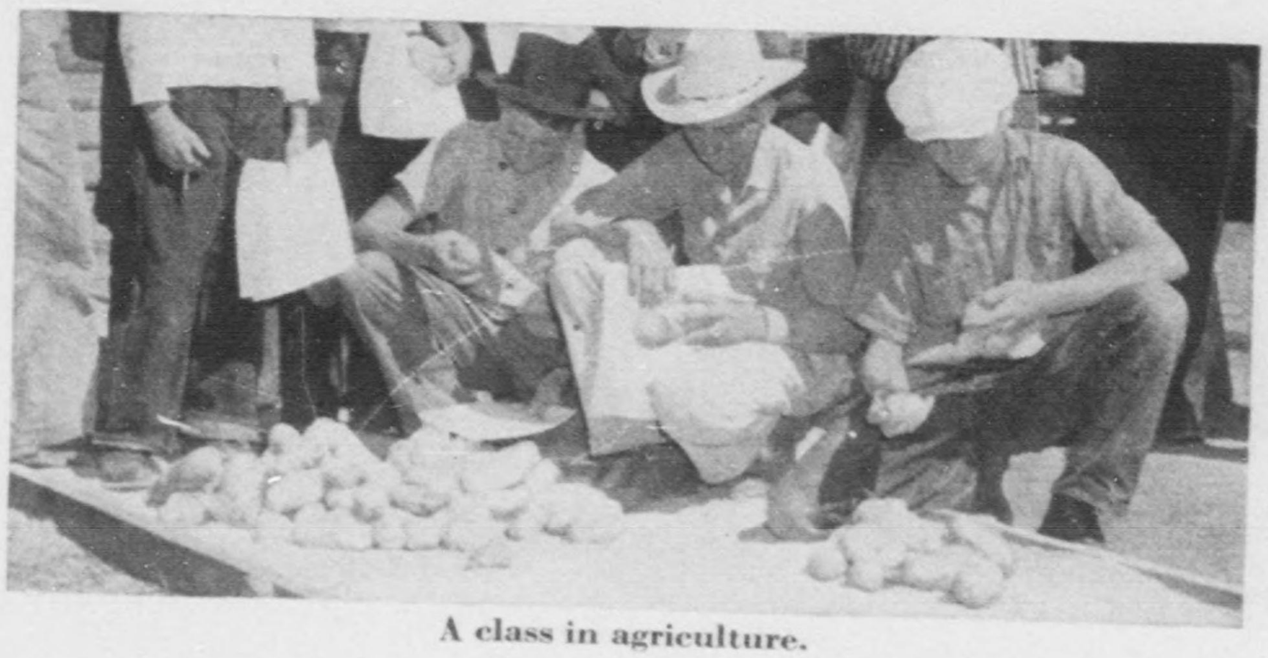
In another factory, college men rose to superintendency in six years as against fifteen years for the non-college.

The difference between success and failure is often a matter of information. The trained person has the information or is acquainted with the ways and means of getting it.

One who knows can direct others; one who doesn't know takes orders from some one who does know.

Just going to college won't make a success out of failure material. What a boy or girl gets out of college will depend upon what he puts into it. The boy who is spoiled at college probably would not be worth much if he stayed at home.

COLLEGE-TRAINED FARMERS USUALLY MAKE THE MOST MONEY



A class in agriculture.

In Kansas for one year the annual income of farmers grouped as to schooling shows:

Common school	$ 422
High school	545
Partial college	859
College	1,452

A recent survey of the graduates of the Georgia State College of Agriculture shows the following results:

5 per cent of graduates now earning from	$1,000	to	$1,500
12 per cent of graduates now earning from	1,500	to	2,000
35 per cent of graduates now earning from	2,000	to	2,500
38 per cent of graduates now earning from	2,500	to	5,000
10 per cent of graduates now earning more than			5,000

Schools put us in touch with the great storehouses of information and teach us how to find our way about in those storehouses. Getting acquainted with what there is to learn and how to go about learning any given subject is quite as important for us as what we learn.

In choosing a college, we should select the type of college that gives the best training for the work we want to do. The agricultural college gives valuable training for farming or for any of the industries closely allied to farming. A farm boy who selects an agricultural line of work capitalizes his farm experience.

Earning power is important, but it is only one of the standards for measuring the value of an education.

If you go to college just to have four years of good fun before you start to work, college won't help you much. It'll be hard to get the work habit after such a fun spree. He who makes his schooling good training for getting knowledge and then continues this habit of getting knowledge after he leaves school is the winner.

DARE TO FACE THE FACTS

Eventually every person must face the facts. For a time some facts can be avoided. For a time some facts can be covered up and ignored but eventually they catch up with us.

It isn't always pleasant to face facts. Facts sometimes hurt our feelings or injure our pride. Facts may leave us without excuses. Some folks are afraid to face facts because facing facts may force them to change their whole lives. Some folks are too lazy to face the consequences that accepting facts may involve.

We can't make right choices unless we are honest and unafraid in facing facts. Folks who don't get their facts right waste effort on hopeless tasks.

Some folks go through life with their own little machinery all set up. "That's all wrong" they say of anything that runs counter to their feelings or notions. Such an attitude won't take one far.

Faith goes beyond facts, but a faith that is disproved by facts or is afraid to face facts isn't much of a faith. A runner-away-from-reality doesn't travel in the right direction. **Evading or bucking facts develops cheats and cowards.**

The value of a fact like the value of an egg depends upon the use made of it. You may cook an egg to provide nutritious food for yourself or family; you may handle the egg carelessly and make a mess of it; you may derisively "egg" someone with it. The only thing that is GREATER THAN FACTS is THE DESIRE TO USE FACTS CONSTRUCTIVELY.

BOTH HANDICAPPED—NEITHER CAN GET FAR

Long on information but short on work. He believes a thing is done when he has information about it, or perhaps he goes even further and makes a plan. He forgets that he has to work his plan.

TWO EXTREMES

Long on work but short on information. He just works, works, works, without thinking or making any plans. He's useful but he doesn't get as much out of living as he should.

The valuable person is one who **sees what to do and gets it done. He holds the vision and uses the tools.**

The world does not ask "What do you know?" It asks "What can you do?" There is always a job for one who "knows his stuff" and can turn out results.

We must not only think things through; we must work things through. Thinking a thing through is only a starting point. We change and modify our thoughts as we work things through. Anything that you can think clear through to the very end before starting to work isn't very much mixed up with the lives of others or closely related to the world we live in.

"He who reads and reads and does not what he knows,
Is he who plows and plows and never sows."

Some who have little knowledge use what little they have so effectively that they outshine others who have had better chances at an education. **The mental attitude about getting things done counts as much or more than mental ability.**

Begin now to acquire **the knack of using your knowledge.** Using what you know about little things will train you to handle the big things when they come along.

A little knowledge used is better than a lot of knowledge not used. **Decisions are not worth much unless they are based on knowledge and followed through with intelligent effort. We must not only "mean well" but we must "mean well intelligently."**

DON'T STOP WITH GETTING INFORMATION —USE IT

You can't learn to run an auto by simply reading the instruction book. You have to get your hand on the wheel and your eye on the road, and keep your mind alert.

On the other hand, many a good machine is ruined because its owner didn't read the instruction book or didn't know enough to apply the information it contained.

The trained man reads the instruction book and acquires skill at the wheel.

Training is knowledge plus the ability to use it.

Training comes through struggle—through meeting and overcoming difficulties.

If you specialize on "snap courses" in school, you'll find yourself in trouble when it comes to holding a job requiring a trained person. Snap courses give no training for sticking on the job until one gets results.

Success came suddenly to Lindbergh, but he was a "trained" aviator.

Thackeray awoke one morning and found himself famous, but Lord Northcliffe said of this: "When that morning dawned, Thackeray had been writing eight hours a day for fifteen years. The man who wakes up and finds himself famous hasn't been asleep."

You can't "know your stuff" without studying and working.

More and more, our schools and colleges are putting in the type of work that gives training as well as information.

More and more, facilities are opening for continuing our training all through life. It's folly to think you can't learn things after you are grown.

Knowledge is power only when it is set to work. Don't try to TELL the world that you know something, but make the world FEEL and SEE that you know something. Deeds and not words rule in the affairs of life.

DON'T EMPHASIZE YOUR MISTAKES, BAD LUCK, OR ACCIDENTS

This is surely an uncomfortable, ugly accident, but if the driver has ordinary ability and courage, he'll fix things up and proceed on his way. It would be foolish to stop here.

The night is dark and one light is on the blink, but he travels on just the same. He'll probably give his lights a better check-up before he starts on another trip.

It's nice to think we can go through life and never make a mistake, but it can't be done. Folks who are always right don't do much. Profit by the experience in your mistake and then forget it. If you find you are on the wrong track, switch. Don't worry about the time lost. Just get over on a better road as quickly as you can. A failure may be only a stepping stone to success.

Perhaps you are on the right road and know that you are right, but in order to hold the track, you must make some detours. Detours are never popular but they are often necessary and sometimes they reveal possibilities we would not otherwise discover.

Sometimes accidents can't be avoided. You may be running along smoothly and an unexpected jolt jiggles your going all out of kilter. Such accidents are hard to take, but sitting down and nursing your trouble won't help. This is a world where accidents happen. Get up. Keep going. Find a way out. Don't use an accident as an excuse. The test of life is the ability to live through a crisis.

Folks are always generous in making an allowance for an accident, if we don't sit down and whine about it, but don't overtax the generosity of your associates by inviting accidents through carelessness or ignorance.

It has been noticed that when we are well-behaved, we have fewer accidents.

DON'T FOOL AWAY THE GROWING SEASON

"Just been foolin' 'round all summer doin' nothin'." This was a farm boy's comment on a barren stalk of corn used as illustrative material at an agricultural short course.

Just fooling around all of his growing season doing nothing or sometimes worse than nothing. Result—a barren, childishly habit-bound, stunted life. A worthless time-fritterer and dilly-dallier

Don't give yourself a chance to regret neglected opportunities and a not-too-well-employed past.

Time passes. Your possibilities are not realized. Your enthusiasm cools. You reach middle age in the might-have-been class.

Opportunity comes not just once but many times. It's not something magical that changes our whole life. "Too often we expect opportunity to be a child of ease clothed in splendor, but it is more apt to be a child of hard work clothed in overalls."

"Here comes dawning another blue day!
Think. Will I let it pass useless away?"

—Goethe.

DON'T SHORTEN THE GROWING PERIOD

This growth takes about one year.

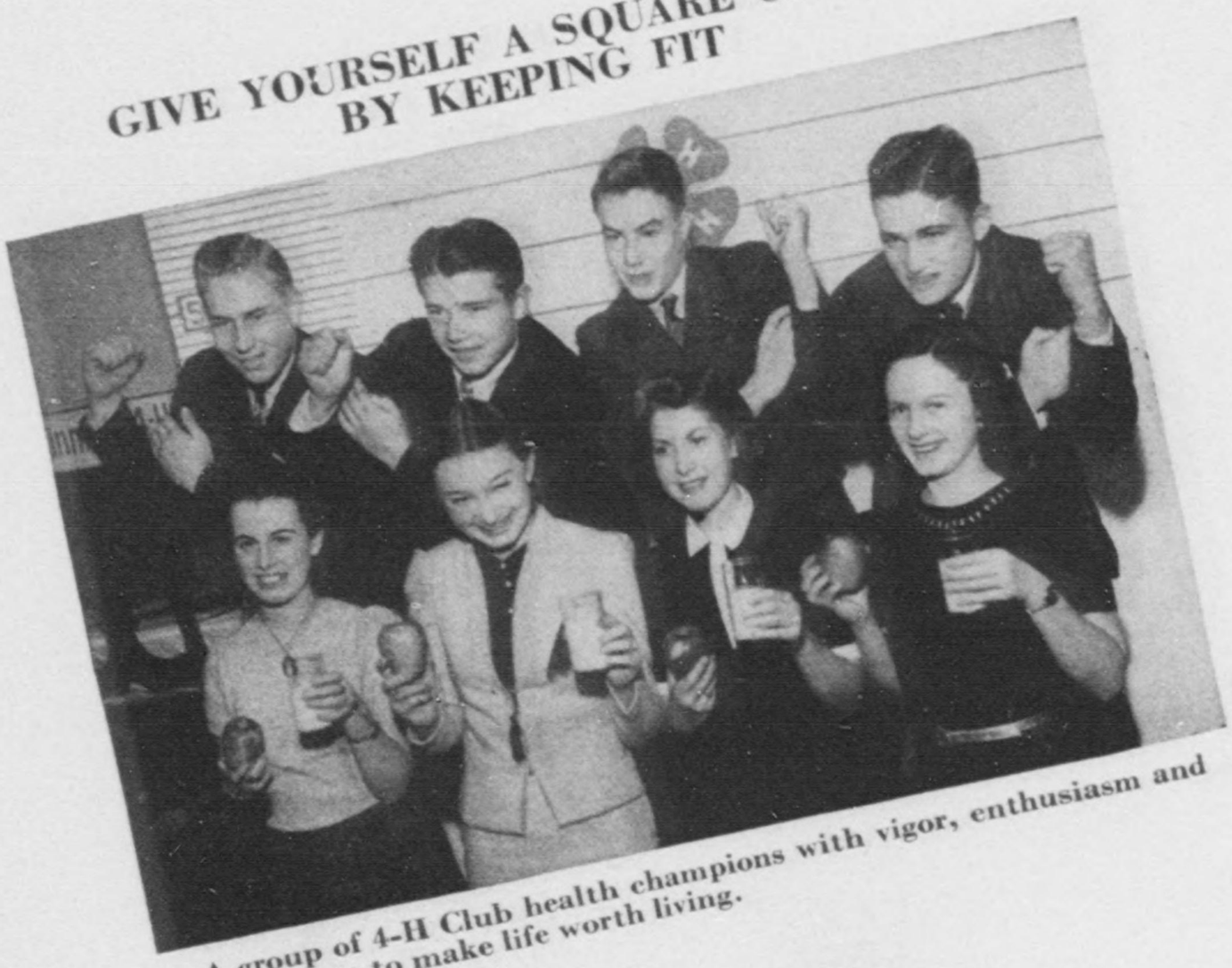
This growth takes about 21 years.

Scientists tell us that one of the reasons man has superiority over other forms of life is because he has a longer infancy and a longer growing period.

A healthy, normal growth—not too fast and not too slow—is desirable. Rushing maturity and the activities belonging to maturity stunts development, as every farm boy knows.

Some of our greatest men have been rather slow in finding themselves and their place in life, but one thing is sure—they kept trying to find it.

GIVE YOURSELF A SQUARE CHANCE BY KEEPING FIT



A group of 4-H Club health champions with vigor, enthusiasm and endurance to make life worth living.

Most of us are born healthy.

We build health by following good health habits.

We lose health by encouraging bad health habits.

A weak person with flabby muscles and starved or diseased body is not square to himself.

He can't work well.

He can't play well.

He can't expect much success in life.

He is poor company for he has no energy to go out sympathetically to others.

He has little endurance. It takes all his courage to just keep living.

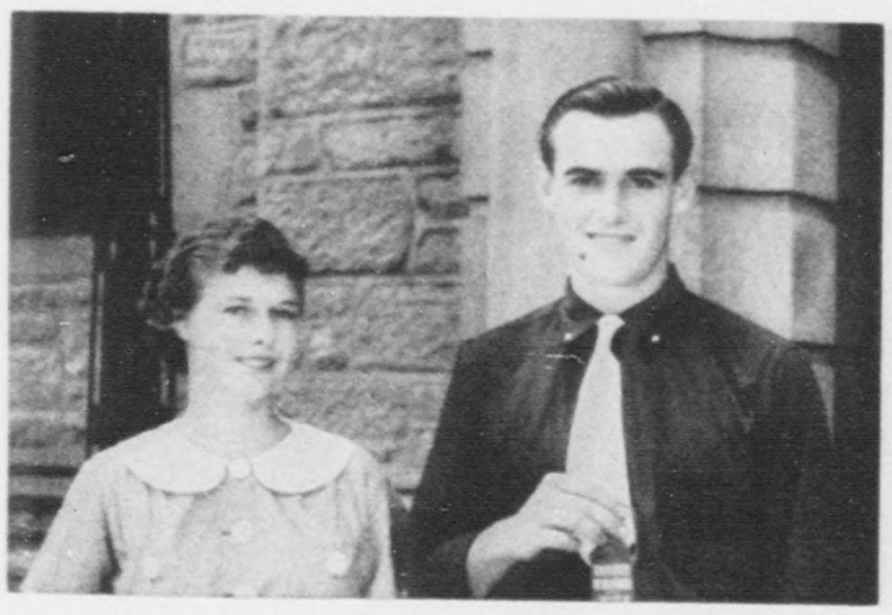
We can't go far, if we don't keep fit.

Health is more than not being sick. It is more than just being up and around. It means having enough vigor and enthusiasm and endurance to make life worth living.

CONTESTS HELP TO TEACH HEALTH

Winners of the Health Contest at the International Live Stock Exposition. One of the four H's in the Boys' and Girls' Club symbol stands for Health.

Members of 4-H Health Clubs keep a record throughout the year, two scores being used. One score checks the outward signs of health and indicates points where improvements can be made. The other score checks whether or not the foods eaten furnish the right materials for growing boys and girls. Health Club membership helps young folks in establishing good health habits.



(Left) A pair of 4-H Club health champions in the state of Missouri.

Bad health habits can't be corrected with medicine. They must be replaced by good health habits. Only doing counts when forming habits. You can, if you will.

STAND UP TALL

Don't Slump Through Life

Stand tall. Head up, chest out, abdomen in, feet parallel and pointing straight forward as though you were balancing a weight on the head.

All wrong. Shoulders rounded, toes turned out, back caved in, and stomach protruding. This is a beauty-and-health-destroying posture.

In walking, the toes should point straight ahead with the body weight falling through the long arches and not back on the heels.

Whether you are 16 or 60 there's no spring to your step, if you walk with your feet turned out and your weight on your heels.

Cultivate good posture habits. A slumping body indicates a slumping mind. Replace a "let-go," "just-get-by" attitude with a keen, alert, "up-and-coming" attitude.

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SIT UP STRAIGHT

Bend from the Hips

Sit tall. Push the lower spine well back into the chair and lean back so that the shoulders touch the chair back.

Sliding forward in the chair and sitting on the lower spine places the weight wrongly and is very injurious.

Have your desk the right height and your chair in the right position so you can lean forward from the hips.

Leaning forward from neck, waist, and shoulders cramps the chest and throws undue strain on the shoulders and back muscles.

If the parts of an auto are out of alignment, the car won't run well or last long. Good posture is nothing more than a good alignment of the parts of the body so that no part bears undue weight or suffers undue strain.

GOOD POSTURE PREVENTS STRAIN AND AIDS BEAUTY

When carrying bundles, keep a straight back and even shoulders.

This lop-sided position tends to develop a lop-sided body.

In climbing stairs, let the legs and feet do the work and keep the chest erect to allow room for breathing.

This not only appears ungainly, but it makes a hard job of going up—result, a tired back.

Style in dress is impossible without good posture. Speaking of dress, we might mention that being appropriately dressed for the activity in which we are engaged is a part of good dressing.

We carefully plan our dress-up clothes. It is even more important to plan that our work outfits are clean, appropriate, and comfortable. It is better to discard high-heeled, dancing slippers and party dresses than to wear them out at work.

SPRUCE UP—DON'T SLOUCH THROUGH LIFE

Wearing overalls is no excuse for slouchiness. An overall suit can be clean and neat and have all the buttons on.

No matter what sort of clothes you wear, you can keep your face clean and your teeth brushed regularly.

Orderly habits save time and make for efficiency. Taking care of your personal belongings is a good way to start habits of orderliness.

His appearance is fine and he doesn't disappoint us when he talks, for his English is good, his enunciation clear, and his voice pleasant.

No matter what you do in life, you have to talk and write. Get acquainted with good English and learn to modulate your voice and pronounce your words distinctly. The radio and the talkies are making us more discriminating about speech and voice qualities.

Cleanliness and order and good speech habits are not matters of instinct. You must grow these good qualities into your life just as you grow other good things into your life—BY PRACTICE.

BE HONEST

The worst thing about lying and cheating is not that the other fellow does not believe you, but that you can't believe yourself. You lose your self-respect and, if you follow the policy long enough, you lose the respect of others. A person who has no self-respect is a hopeless proposition.

A liar or a cheat soon loses the power to direct his life. He becomes the victim of the "easiest way out" and that's a way that leads to failure.

Lying upsets living with others because it is difficult to make plans for action with people who don't speak the truth. We feel insecure and unable to control affairs. We waste time. We lose confidence.

A cheat often fails to see his real opportunities. He's like a card player who gets so absorbed in getting his cheating signals across to his partner that he misses making the points that rightly belong to him.

Nobody ever gained any permanent advantage or did any permanent good by being dishonest.

"Truth is your truest friend, no matter what may be the circumstances."—*Lincoln.*

LEARN TO HANDLE MONEY WISELY

Neither gets the most out of living.

A spendthrift lacks judgment, will, and purpose. He rarely holds a position of trust; no one feels that one who can't handle his own funds is capable of handling the money affairs of others.

A miser, or mere hoarder or saver of money, is never much of a man. He squeezes all *developing* opportunities out of his life, because at the outset some expenditure of money may be necessary.

TO HANDLE MONEY WISELY WE MUST:

EARN. Do it now. Find some opportunity to make money even if you make only a little.

EXERCISE JUDGMENT IN SPENDING. Consider the value of what you buy. Get the things that count most for you. It may be good judgment to spend all you have at the time being. That depends upon what you are getting.

SAVE. Savings are nest-eggs that make investments possible.

INVEST. Learn what kind of investments are good and what are poor. A good investment often makes more than you can earn. Invest a little money in something, even if it isn't much. Some folks borrow money to invest. This is good business, if you "know your stuff." You can't borrow money without credit. **Credit is built on character and on your reputation for meeting your obligations.**

KEEP A RECORD OF WHAT YOU OWN. This is good training for future business. The accounting department is an important part of any business.

CONSULT your father, mother, banker or some business man when you want to undertake something new. Getting the viewpoint of experienced folks will give you a basis for doing good thinking and may save you a lot of trouble. When seeking advice lay all of your cards on the table. If you don't, you are not fair to your counselor.

PAY YOUR OWN WAY. Don't enjoy luxuries at the expense of someone less able to work than you.

GROW THESE HABITS NOW. If you wait until you are through high school and through college, it'll be hard to start.

Handling money affairs wisely requires judgment and self-discipline. To be able to manage your financial affairs builds courage. It's hard to be brave-hearted when your pockets are empty.

HAVE FAITH

It takes faith to try out opportunities. Faith in our abilities. Faith in others. **Faith in things as they are and in the possibilities awaiting us.**

Many people let good opportunities pass because they doubt. They try to see the end from the beginning. They won't get into motion. They fuss and fret and flutter until the right time for action is past.

Faith enables us to give our visions a work-out.

It starts us on the way to adventurous achievement.

It gives us strength when the going is hard.

It gives us patience to abide our time for results.

It gives purpose to action.

It calls to its support our last ounce of strength and skill.

Faith doesn't change facts, but it is the driving power that goes ahead to meet facts that are still in the offing. It discovers and proves new facts. It rearranges and reorganizes old facts into new and helpful relationships.

A faith that doesn't move us into action isn't much of a faith.

It takes a lot of faith, hope, good will, and cooperative effort to build roads of industrial and social progress. Facts are only road-building materials; they are of little use until considered from the standpoint of human welfare.

At many fact-finding conferences, the changing of attitudes is as important as the presentation of facts. Some attitudes which block progress are:

STANDPAT. Let's not meddle. Things are all right as they are.

DOUBTFUL. The job can't be done. It's too big to tackle.

LAISSEZ FAIRE. Let things work themselves out. We won't do anything until we have to.

INDIFFERENT. It's not up to me. Let the other fellow take the initiative, risk the capital, and do the work.

SELFISH. We'll fight against any change that threatens our business or our prestige.

BE A FINISHER

Many Start—Few Finish

Finishers are rare. We admire them. Most finishers succeed. Any one who "fights to the finish," even though defeated, commands our respect.

We can't be finishers unless we have FAITH in what we are doing, COURAGE to face opposition and criticism, and ENDURANCE to bear the daily grind of work.

It takes courage to hold to a purpose.

It takes courage to stand criticism.

It takes courage to keep going when the going gets tough.

Courage is a **heart** quality. It is strengthened by self-respect, self-confidence, faith in the worthwhileness of what we are doing, honesty in our purpose, right feelings toward those about us. It's hard to have courage, when we don't keep physically fit.

Self-pity destroys courage. When a man begins to feel sorry for himself, he loses the sympathy of the whole world.

You are never really defeated until you admit that you are.

It's the right kind of self-pride to feel that you can be as clean, as neat, as honest, as honorable, as polite, as much of a gentleman, or as much of a lady as anyone.

It's the right kind of self-pride to feel that you have the ability to do worthwhile things.

You won't have much courage, if you don't keep continually building your self-respect by doing worthwhile things and by knowing that you are on the square with yourself.

Defeat may serve as well as victory
To shake the soul and let the glory out.
When the great oak is straining in the wind,
The boughs drink in new beauty, and the trunk
Sends down a deeper root on the windward side.
Only the soul that knows the mighty grief
Can know the mighty rapture. Sorrows come
To stretch out spaces in the heart for joy.

—Edwin Markham.

CO-OPERATE—YOU CAN'T GET FAR WORKING ALONE

Executive: "How about giving John that position that has just opened?"

Office Manager: "I can't recommend it. He's a good worker and knows his line, but he doesn't get along with folks."

You can't go far these days just on your own power; you must take others with you.

You must not only **know how to do things, but you must know how to do them with folks.** The bigger your job, the more folks you'll have to know and work with. The Engineering Association of America makes the statement that knowing how to do the technical part of an engineering job is only a small part of engineering efficiency.

Men are learning new ways to pull together and as they learn new ways of pulling together, they are getting more of the good things of life for themselves.

In life, as it is organized today, you'll be out of luck if you can't work with folks—the kind of folks you have right around you now. If you wait to work with the kind of folks you'd like to work with, you never will find them.

City folks have learned the lesson of working things out together, perhaps, a little better than farm folks. They've had to. The next twenty years will see a great change in the way farm folks will work together to get their share of the good things in life.

Keep this in mind if you'd learn to co-operate: **Co-operation means to conduct yourself so that others can work with you.**

"A man's no bigger than the way he treats his fellow man."

CO-OPERATION MEANS TO GIVE AS WELL AS TO GET

"Don't you think WE'D ride better if YOU'D get off?"

Some grown-ups have not outgrown this child-ish idea of co-operation.

Co-operation is a **GIVE and TAKE** proposition. You are not really co-operating unless you do both.

The value of your giving will be measured by the spirit prompting it. If you give with an eye on what you are to get back, it won't amount to much. You'll be disappointed with the returns. Your selfish motive is felt and resented. Folks judge the quality of an act by the feeling prompting it.

"Give to the world the best you have,
And the best will come back to you."

Real co-operation is based on an understanding of the other fellow's point of view. You can't really co-operate without knowing a lot about folks. If you limit your friendships to one class or one clique, you narrow your opportunities of learning to know folks. Broad sympathies and a broad understanding of life are not attained that way.

Anyone can be exclusive—that means simply building a wall around one's self and saying, "Stay away—keep out."

It's harder to be inclusive. That means growing something within you that appeals and attracts. If we are big enough, we gain something from every one with whom we have contact.

**"He drew a circle that shut me out,
Heretic, rebel, a thing to flout;
But love and I had the wit to win,
We drew a circle that took him in."**

—Edwin Markham.

ATTITUDES ARE HABITS OF FEELING

These ears catch the rain, and the moisture works itself inside the husk, starting decay and rot. Certain attitudes open the way for trouble.

Wherever there are folks, we can't get away from meeting with good and with bad influences. The result of these influences upon us will depend upon our attitude.

We excuse ourselves for a temper flare-up or for a grouch by saying, "That's my disposition, I can't help it."

Our attitudes are grown early in life and become so much a part of us that we think we can't change them. That's why it is important to have the right home and school atmosphere about little folks.

Some of us act more quickly than others when our feelings are aroused, but the quality of our acting can be directed by taking thought. To keep from doing something rash when angry, we are advised to "count ten." Just a device for quick-acting people to gain time for thought.

Wholesome attitudes are as important to our welfare as wholesome food.

Sound judgment about a situation depends as much upon a right attitude as upon accurate information.

A slight change of attitude often makes a great difference in results.

CULTIVATE WHOLESOME ATTITUDES

Suspicion, jealousy, anger and hate are attitudes that keep us from seeing clearly and thinking straight.

Doubt, fear and gloom are attitudes that destroy our self-confidence and undermine our courage.

A self-conceited, know-it-all attitude arouses antagonism and shuts us off from valuable sources of information.

A grouchy, touchy, selfish attitude makes us lose out in any job that calls for co-operation with others.

A fair, let's-get-the-facts attitude inspires confidence.

An enthusiastic, let's-get-this-done attitude creates good fellowship in work.

Viewing work as a means of getting what we want out of life takes the curse from it.

Seeking the best in the folks and the things about us develops the best that is in us.

Living fully here and now instead of waiting ten, twenty, or thirty years to start enjoying life enriches our everyday experiences.

If your attitudes head you in the wrong direction, start a vigorous re-training school for yourself.

This ear bends over just enough so that the water runs off and falls to the roots where it is helpful. Good attitudes help to ward off trouble.

PLAY AND RELAXATION ARE IMPORTANT

Play adds to the richness of life. A person who doesn't know how to relax and laugh and play and enter into happy companionship with others misses out on some of the heart things of living.

Play makes it possible to develop powers or skill which we have no opportunity to develop during our hours of work.

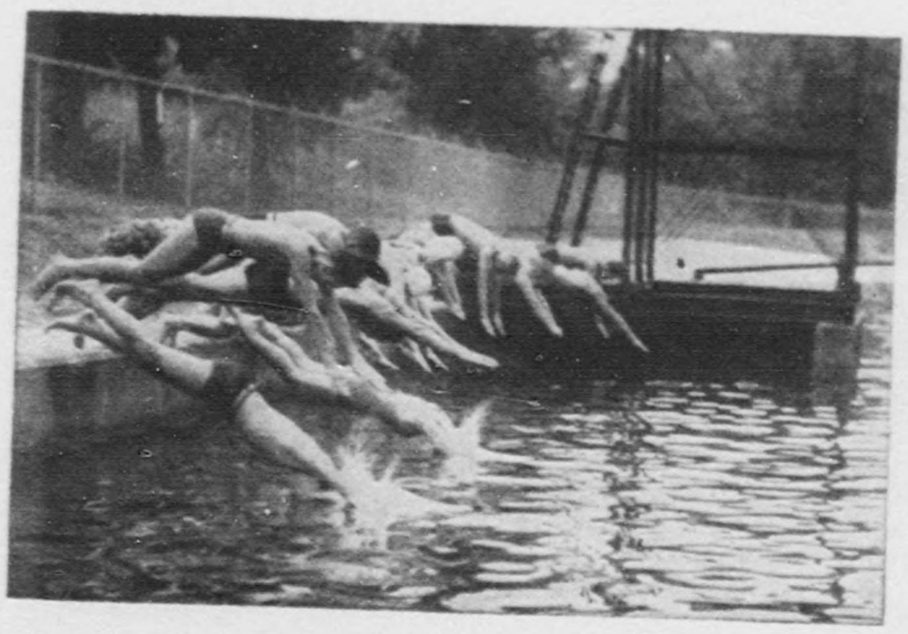
Start now to grow skill in some things you **like to do.** If we postpone enjoying life, we find our enjoying machinery is undeveloped and it's too late to acquire skill easily.

Folks are not born with the ability to sing or dance or read poetry or paint pictures or play musical instruments; they are not naturally skillful in playing ball or tennis or golf or bridge; they don't naturally know about birds and flowers and things which add to the richness of outdoor life. These are skills which are acquired.

Because we can't do a new thing well, we sometimes hesitate to tackle it. We are as foolish as the boy who said that it wasn't any use for him to go to school because he couldn't read or write or "figger."

It's not pleasant to go through the clumsy, awkward stage of acquiring a new skill. It takes effort and courage. If we are not willing to exert ourselves enough to learn, then we forego the pleasure and companionship which would have been ours had we developed our abilities. A good teacher helps a lot in the initial stages of acquiring skill. It's a good thing to learn some forms of recreation while we are young for skill in such things is easily acquired then.

Our time for play is limited. We can't play all games. Neither can many of us grow to be champions in the games we do play. We like, however, in either work or play, to be able to hold our own with the folks about us and to get our share of the pleasures and companionships of life.



(Left) A scene from a summer camp. These activities are good body builders and afford an opportunity to make many new friends in other walks of life.

DON'T PAY TOO MUCH FOR YOUR FUN

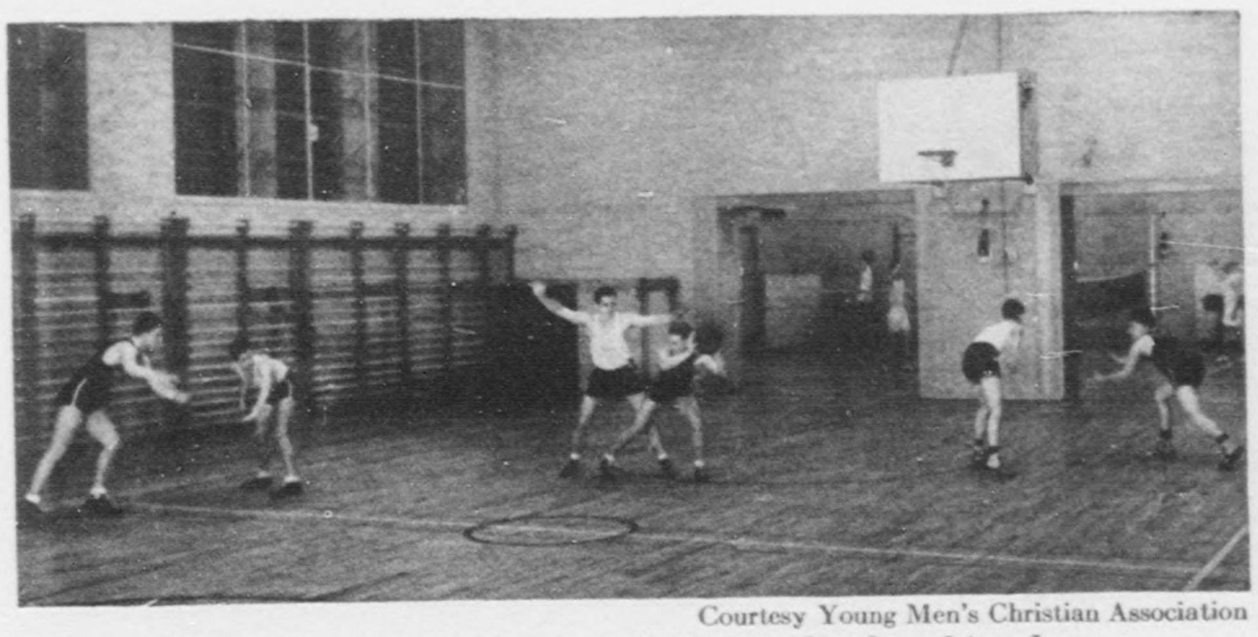
It takes intelligence to have real fun in life—the kind of fun that doesn't cost too much. Every day or so the papers tell the story of some young folks who pay too high a price for "a good time." Ed. Howe gives this wholesome advice, "Don't charge to the future one dollar for every ten-cents' worth of fun you have today." Judged by this standard, a lot of folks who think they are having a good time are unkind only to themselves.

Restless, purposeless excitement advertises a lack of inner resources and an inability to direct your energies. Extreme excitement and over-stimulation usually end in a let-down that is far from comfortable. Folks who are always on the go and madly chasing a good time are generally disappointed, for they too often miss the deeper truths of life.

Folks who look for a good time wholly in the things and forces outside of themselves are headed for trouble, for our own attitudes determine, to a great extent, what effect outside forces will have upon us.

Folks who buy all their good times instead of making some of them soon become "fed up." They fail to get the experience that comes from doing something themselves and gain only a superficial understanding of things which leads them to think that everything is shallow and empty and purposeless.

Some folks who have never been outside of their home state enjoy life more and have a better understanding of it than others who have trotted around the globe. They have had richer experiences. They see deeper. What we get out of an experience depends upon what we bring to the experience.



Courtesy Young Men's Christian Association

Many desirable human qualities are developed in play.

LIVE RICH

The late Lorado Taft, the great sculptor, told this story:

He and his family were spending a few days in a country home. One evening they were all enjoying the wonderful sunset when the little neighbor girl, who was assisting in serving their supper and listening in on the conversation, asked:

"Please, may I go home for a few minutes?"

"Why do you want to go home?"

"To show the folks the sunset."

"They'll see it, won't they?"

"No, they won't, for there is nobody there to show them."

We can't enjoy the things about us unless we cultivate within us the ability to appreciate them.

A thing appeals to us only when there is something within us that reaches out and responds to the object of appeal. When we limit ourselves too narrowly to things necessary just to make a living, we miss out on many of the joys of life. We have **little in us to see with** and often we don't even know that we are missing anything.

We may be happy in our ignorance, but it's a limited, narrow happiness. It shuts us off from the great souls about us and from great sources of pleasure. It's not enough just to be happy; we must be **intelligently happy.**

Take a little time each day to cultivate the heart things:

Enjoy the trees and flowers and birds.

Collect the poems and pictures of out-of-doors.

Appreciate the sunsets and the flow of water.

Find the beauty spots in your community.

Read a good poem each day.

Take time to cultivate friends.

Learn a little music.

Have a hobby—change hobbies from time to time and get a look-in on other phases of life.

Set aside a little time to think and meditate and check up on where you are going.

Training ourselves to see and appreciate the beauty around us is as important as training ourselves to make a living.

Some one asked Aristotle: "Why do we linger around beautiful things?"

"That's a blind man's question," was the reply.

Folks who love beauty create beauty in the things about them.

THINK THROUGH THINGS TO FOLKS

SCRUB THINGS indicate little thinking and shiftless doing.

GOOD THINGS indicate good thinking and careful doing.

No matter where we live or what we do, it's good for us to have clean, efficient, worthwhile, beautiful things about us.

Sometimes we are short-sighted and work too hard, merely to accumulate and own things rather than to understand and appreciate and properly use things.

An Iowa farmer, who experienced a change of heart regarding things, put it this way:

"We used to work for our pigs, our chickens, our cows and our crops. We never thought what these things would do for us. In those days we never went anywhere or saw anybody.

"Now we have our chickens, our pigs, our cows, and our crops working for us. That's why our whole family is down here at the state fair, studying about things and folks and learning a lot, too."

If, in all that we do, **we think through the things with which we work to the folks that the things are to serve, we'll delegate things to the right place and use them in the right way.**

Through discoveries and inventions we are making things serve folks in ways undreamed of a century or two ago. As a result, we are taking drudgery out of life and making it possible to **give everybody a chance to know something and to have clean, worthwhile, beautiful things about them.**

The things we have about us reflect ourselves.