

Teaching Arithmetic by Radio

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MANY PERSONS interested in radio in education believe that radio teaching should merely supplement classroom work, so as to vitalize and enrich curriculum content. Others contend that radio teaching should be an integral part of classroom instruction, carefully planned so that it will furnish the curriculum in a given subject for a given grade. The radio experiment in Cleveland is based on the latter belief.

Research workers in Cleveland have not been satisfied with the results of regular classroom instruction in arithmetic. Too many students who complete the junior high school lack the arithmetic skills and technics that would enable them to compute accurately and to reason to advantage. Many arithmetic teachers feel that power in arithmetic can be created and developed if particular attention is paid to the tasks the child is asked to do and the things he is asked to think about. Radio provides the medium for experimentation along these lines. Radio lesson sheets and drill sheets contribute tasks for the child to perform; radio talks tell him what to think and do as he performs these tasks.

The teacher's part—Technics employed in teaching arithmetic by radio parallel in many instances technics used by classroom teachers of arithmetic. To reach the desired goal in arithmetic teaching—power to reason as well as skill to compute—the intelligent radio or classroom teacher clearly outlines a method of procedure, perceives the importance of contributing factors, and persistently endeavors to reach the desired end. She carefully organizes the learning material that she is to present to make sure that it utilizes children's interests and experiences; takes care of the various habits needed for computation and reasoning; provides for individual differences; and measures achievement at regular intervals. She studies the learner to make sure that his participation is backed up by genuine interest and understanding.

Radio lessons in arithmetic are sent directly to Cleveland classrooms two days each week. Lesson sheets allow the child to participate during the teaching period, while, between broadcasts, drill sheets afford practise on the abilities presented

in the lesson. This plan means that the person at the microphone not only controls the amount of learning material, but also directs the method of learning this content.

Technics used—Perhaps the best



SUPERINTENDENT R. G. JONES, *Cleveland, Ohio, under whose leadership masterteaching by radio is going forward on an effective scientific basis.*

way to describe teaching technics used in this radio experiment is to discuss technics used in a group of radio lessons. Since the 3A curriculum calls for certain abilities in each of the four processes as well as the ability to solve one- and two-step problems, we shall center our attention on 3A material. The first three lessons in the 3A schedule are tests on the work in addition, subtraction, and multiplication covered in Grade 3B. These tests are followed by Lessons 13 to 18 in Multiplication, which are a continuation of the multiplication taught in Grade 3B. Then follow Lessons 1 to 6 in Short Division; Lessons 31 to 33 in Addition and Lessons 25 to 27 in Subtraction; Lessons 19 to 24 in Multiplication; Lessons 7 to 12 in Short Division. This radio teaching material is built in units of six lessons, the sixth of each series being a test on the five preceding lessons. For example, Les-

son '18 in Multiplication tests the radio class on the material taught in Lessons 13 to 17, Multiplication.

The last two lessons of the year are Lessons 3 and 4 of the *Classroom Situation* series. In Lesson 3, the class is asked to plan how it will spend its time—the number of hours spent in school, at meals, at play, for free time, and for sleep. In Lesson 4, it is asked to help Tom, Will, and Joe plan their garden. They find out the size of the garden, the cost of seeds and garden tools, and each boy's share of the expense. On drill sheets accompanying these lessons are two twenty-minute tests on the learning material taught in Grade 3A. These tests are given by the classroom teacher.

The Cleveland course of study outlines in detail the quantity of learning material for Grade 3A. This outline furnished the basis for the selection of content for the radio lessons. Conferences with many teachers of radio classes helped the builders to eliminate certain abilities and add others so that the material would fit a large number of average 3A children.

A radio advantage—Right here lies one advantage of radio teaching. Curriculum material tried out, revised, and tried out again on many 3A classes of average ability should be a better test of the fitness of that learning material than a curriculum committee's idea of its fitness. It is a distinct advantage to get the reactions of many classes and many teachers to definite material presented to all children in the same manner with like practise material available for individual difficulties.

Ways of presenting this 3A curriculum material contribute much toward the success of the radio experiment. Let us examine in detail technics used in multiplication and in problem solving.

The carrying figure—The process of multiplication presents difficulties. Many children know their multiplication facts but find it difficult to add a carrying figure to an unseen partial product. In multiplying 869 the child must not only

6

know 6×9 , 6×6 , and 6×8 , but he must be able to add the carrying figure 5 to 36 and the carrying figure 4 to 48. To add carrying figures to unseen partial

products requires much practise of various sorts. The radio material gives different drills to strengthen and perfect this hard ability. Let us suppose that the following exercise is on the radio lesson sheet:

Row A. Write the answers only:

2	6	8	4	9	0	7	3	5	1
—	—	—	—	—	—	—	—	—	—

In this case the broadcaster gives the following directions:

"This drill will help you add the carrying figure in multiplication. Multiply each number on your paper by a number that I call out; add a carrying figure; write the answer only. Pencil below the first line. Ready? Eight 2's and 5. Ready? Nine 6's and 7. Next: Six 8's and 4, and thus to the end."

Another drill is given in this form:

Row C. Multiply each number by 8 and add 7 to the product. Write the answer only.

6	0	8	2	4	9	1	7	3	5
—	—	—	—	—	—	—	—	—	—

These drills also help the child to add the carrying figure in multiplication:

Row A. Add:

3	6	4	8	9
48	49	54	16	35
—	—	—	—	—

Row B. Write the answers:

$[6 \times 8] + 4 =$	$[7 \times 9] + 5 =$
$[4 \times 6] + 2 =$	$[8 \times 7] + 6 =$

When learning certain difficult combinations such as 7×7 or 6×8 and 8×6 , where the sum of the product and the carrying figure is usually in the next decade, the radio material includes the addition of carrying figures to 49 and 48. Such drills as these are given:

Row A. Study these:

Multiply: Add:

7	2	4	3	5	1	6
7	49	49	49	49	49	49
49	51	53	52	54	50	55

Row B. Write the answers only:

Add:

3	5
49	49
—	—

$[7 \times 7] + 3 =$	$[7 \times 7] + 5 =$
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2	6
49	49
—	—

$[7 \times 7] + 2 =$	$[7 \times 7] + 6 =$
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Row C. Study these:

Multiply:

6	4	5	783	760	791
49	49	49	7	7	7
55	53	54	—	—	—

Besides the tests at the end of each six-unit series, radio lessons test frequently the various abilities in each process

and furnish examples for further practise. Such a test is given on Lesson 17, Multiplication.

Row A. Can you do these different kinds of multiplication examples?

[1]	[2]	[3]	[4]	[5]
624	280	782	186	745
2	5	4	3	7
—	—	—	—	—

Three examples similar to each example in this row are given on Lesson 17, Drill 1.

Row A. Multiply:

[1]	[2]	[3]	[4]	[5]
532	624	261	378	576
3	4	8	5	7
—	—	—	—	—
901	105	670	543	388
2	9	8	9	6
—	—	—	—	—
410	748	762	475	265
5	2	4	3	8
—	—	—	—	—

A sheet furnished to each 3A teacher of a radio class tells her that in example number [1] there is no carrying; in number [2], carrying from ones' to tens'; in number [3], carrying from tens' to hundreds'; in number [4], carrying from ones' to tens' and from tens' to hundreds'; in number [5], carrying from ones' to tens' and from tens' to hundreds', one or both sums in the next decade. An *Abilities Required* sheet for each radio lesson tells the teacher what the radio teacher is asking her children to do and think. These sheets actually outline for the teacher the 3A curriculum in arithmetic.

The builders of radio lessons in arithmetic believe that the child should know where hard abilities in each process lie; that he should be aware of drills that will help him to acquire these hard abilities; that he should practise enough to insure mastery. This belief means that builders of radio lessons must not only be able to do detailed work but must also be able to see arithmetic over a wide range, so as to fit abilities together in an advantageous arrangement.

Adding a carrying figure in multiplication is similar to adding in the higher decades in addition. The teacher must help the child to make this connection, and must utilize habits used in decade additions as a foundation for similar habits in multiplication. Finding the answers to $x 2 = 12$, $2's = 12$, $12 = 2's$ in multiplication help the child to find the answer to $2)12$. Radio lessons help the child to make the connections in this manner: Row A.

$6 \times 2 = 12$	$x 2 = 12$	$2's = 12$	$2)12$	$12 \div 2 =$
$4 \times 5 = 20$	$x 5 = 20$	$5's = 20$	$5)20$	$20 \div 5 =$

Practical considerations—Sizing up quantitative situations and solving problems also present difficulties. The builders of radio lessons in arithmetic believe that the three most important places for a child to meet the vocabulary of arithmetic are [1] in activities; [2] in directions associated with the processes; [3] in problems. The radio teacher assumes that activities are being carried on in each classroom and, as she broadcasts, she suggests suitable problems to which the

child is to find the answers. The 3A radio lessons include such activities as: *Going Camping*; *Earning Money*; *Saving Money*; *Making Covers for Library Chairs*; *Buying for the Home*; *Planning for a Picnic*; *Adding Bank Deposits*; *Planning How You Will Spend Your Time*; *Helping Tom, Will, and Joe Plan Their Garden*. As these activities are taught, vocabulary associated with each process is placed in its proper setting. It is assumed that the teacher also associates arithmetic vocabulary with each process as she carries on activities in the classroom.

Radio teachers give further drill to make sure that the child associates addition with finding the total amount; subtraction with finding how much farther he traveled; multiplication with finding the cost of several toys; division with finding each child's share of the cost of a present.

Proper expressions—Instead of using repeatedly the expressions add, subtract, multiply, and divide as directions for drill exercises, radio lessons often use expressions associated with each process to direct the procedure. These illustrations will make the meaning clear:

Adding Bank Deposits. Row A. Find the total amounts of these deposits:

<i>Tom</i>	<i>May</i>	<i>Ann</i>	<i>Roy</i>
\$1.65	\$1.95	\$2.00	\$1.50
2.34	.35	1.00	1.30
1.22	2.64	.95	1.25

Motoring. Row B. How much farther did Tom travel on Monday?

Mon. 307	Mon. 307	Mon. 307	Mon. 307
Thurs. 279	Fri. 208	Sat. 192	Wed. 200

This procedure gives drill on the processes and also associates *Total amount* with addition, and *How much farther?* with subtraction. In other words, it gives practise in associating expressions with processes. Teachers, as well as builders of radio lessons, feel that this procedure is a factor that has made for success in problem solving. If a child associates *How much farther?* with subtraction in such drills as these, he is likely to subtract to find the answer to this problem:

Tom and his father are driving to Columbus, a distance of 350 miles. On Monday, they drove 225 miles. How much farther must they drive to reach Columbus?

Creators of radio lessons feel that it is just as important to keep a close check on the number of times that such expressions as *total amount*, *in all*, *altogether*, *more expensive*, *cheaper*, *share equally*, and the like, are included in the learning material as it is to check on the frequency of 8×7 or $9 + 6$ or $13 - 7$ or $18 \div 3$. Carefully planned check-sheets enable the builders to check not only on the combinations associated with each process but also on the various words, expressions, and questions associated with addition, subtraction, multiplication, and division in one-step and in two-step problems.

Questions to fit problems—Another procedure that has proved a factor for success in problem solving is having the child select one of two questions to fit a given problem. If he selects the question to fit the problem, he must read the problem carefully and size up the quantitative situation it describes. These drills make this point clear:

Row A. Choose the question that fits the problem. Write it. Solve the problem.

Mr. Allen drove for 3 hours. He traveled 96 miles.

1. At this rate, how many miles did he go in all?
2. At this rate, how many miles did he go each hour?

Row B. Choose the question that fits the problem. Write it. Solve the problem.

Ruth's mother bought a radio for \$96 and a chair for \$64. She is to pay for them in four equal payments.

1. What will she pay in all?
2. What will she pay each time?

Completing problems—These exercises are followed up by many problem statements where the child completes the problem by asking the question, such as:

Buying groceries—Write a question at the end of each problem. Solve the problem.

1. Mary's mother bought 2 pounds of meat at 46 cents a pound.

2. Jack went shopping with his mother. They bought a quart of milk for 12 cents, a can of peas for 24 cents, and a pound of nuts for 35 cents.

3. Bob bought a pound of candy for 85 cents. He gave the clerk a dollar bill.

Radio teachers are aware of problem standards and have tried to include worthwhile problems in the radio material. They also encourage the child to gather data and write problems of his own for members of his class to solve. Interest in problem solving as well as interest in computation is created and fostered in various ways.

Thruout the radio experiment, attention has been directed to the child—to his experiences, to his interests, to his ways of learning—and the builders of radio lessons have endeavored to use these in radio teaching. They have tried to connect arithmetic with its world uses; to present learning material in an educative way; to arouse a desire for accurate computation, thus making quantitative thinking worthwhile; to provide enough practise material on the various skills and abilities; to measure achievement at regular intervals; to organize the learning material in such a way that it is possible for each child to find his difficulties; to provide drill so that he can overcome these difficulties.

So far, results of radio teaching of arithmetic are very encouraging—so much so, that lessons for Grade 4B are being broadcast this semester.

The National Committee on Education by Radio Believes

That colleges and universities with radio broadcasting stations have in their possession one of the most powerful and effective tools for popular education which exists at the present time.

That the broadcasting activities of educational institutions should be looked upon as major educational enterprises within these institutions, comparable in service and importance with other major departments.

That the officers of these institutions, their boards of control, and legislative bodies to which they look for appropriations, should regard their services to individual students and the general public rendered by means of radio as an important and appropriate extension and supplement to similar services rendered within the classrooms of the institution.

That such services have a valid claim to public support and justify expenditure for equipment and personnel.

That the use of radio broadcasting as a constructive educational procedure is in its infancy.

That the radio channels which are now in the possession of institutions are immensely valuable; that they should be retained and their use further developed looking toward the growth of adult education which is now taking place thruout the country.

That this development of programs of adult education by radio stations associated with educational institutions will help to offset the present tendency toward centralization and network monopoly.

The National Committee on Education by Radio looks upon the service of radio stations associated with educational institutions as a service of the whole people. Such service is one of the highest uses to which this national resource can be put. Because such service concerns the entire body of citizens it should be given first place when the question of assigning radio channels is before legislative bodies, the Federal Radio Commission, or the courts.

The Platform of Commercial Broadcasters

THE PLATFORM of commercial broadcasters is set forth in the following statements—all of which may be verified by referring to the records as indicated on this page.

We demand the control and unlimited use of all of the nation's broadcasting channels.^[1]

We deny the right of the state or federal governments to use these channels, except with our permission and thru our stations.^[2]

We deny the right of the state or federal governments to grant the use of any broadcasting channel to any person or corporation not engaged in the advertising and amusement business.^{[1][2]}

We deny the right of the state or federal governments to grant the use of broadcasting channels to state universities, state departments of public instruction, chartered educational institutions, or any institution or organization for any purpose except commercial advertising.^{[1][2]}

We claim and exercise the right to grant or deny the use of the public broadcasting channels to any person or organization seeking to use our facilities.^[3]

We claim and exercise the right to censor any statement of fact or opinion, or other material offered for broadcasting, and the right to separate any speaker or other person from the radio audience, by operating a switch, at any time during any program.^[3]

We maintain that the broadcasting of information or instruction by the President of the United States, by a Justice of the Supreme Court, by the governor of a state, a senator, a representative, or any other public official, for the benefit of the public, is interstate commerce, in common with the broadcasting of commercial advertisements.^[3]

We claim and exercise the right to make an address by the President of the United States, or by any other official or person, a part of an advertising campaign for the sale of cigarettes, securities or anything else advertised over our facilities.^[4]

We claim and exercise the right to attack state-owned broadcasting stations, or other stations operated primarily in the public interest, convenience, and necessity, and to force them to spend, in self-defense, educational funds appropriated

by states or received as contributions. We claim and exercise the right to force them to appear before the Federal Radio Commission, and in court, as often as we please, regardless of their priority on the

THE GREAT TROUBLE with the hearings by the Federal Radio Commission is that they are before ignorant, inexperienced, incompetent, inefficient examiners, and the examiner passes on what testimony he shall admit in the record and upon that which he shall exclude. He keeps out all evidence he does not want to go in, and the record which finally reaches the commissioners is a biased, prejudiced, incorrect, incomplete, warped record that is both unfair and unjust.—Representative Thomas L. Blanton of Texas, *Congressional Record*, February 10, 1932, p3794.

radio channels belonging to the public and regardless of their record of public service.^[5]

We maintain that our business is interstate commerce but that our use of the public broadcasting channels places upon us no obligations as common carriers. We maintain furthermore that neither the Interstate Commerce Commission, nor any other governmental agency has the power to limit the rates which we charge for our services.^{[3][6]}

We claim and exercise the right to transmit our advertising programs into foreign countries, regardless of the wishes of their governments or people.^[7]

We deny that the conviction of a broadcasting company or its owners or agents for violation of law constitutes a valid reason for limiting or denying the use of public radio channels to such companies or persons, the radio law to the contrary notwithstanding.^[8]

We demand that the public radio channels be placed in our hands permanently and exclusively, as our vested property, to have and to hold forever.^[9]

[1] See Federal Radio Commission records for applications of: commercial broadcasting station KLRA for facilities of the state-owned station KUOA; commercial station WOW for facilities of the college station WCAJ; and similar cases too numerous to mention.

[2] See Federal Radio Commission records for applications of: the state of Wisconsin for permission to consolidate its stations WLBL and WHA; the city of New York for increased facilities for station WNYC; and others.

[3] See statement by M. H. Aylesworth, president of National Broadcasting Company, at the hearing before the Interstate Commerce Commission on the complaint of Sta-Shine Products Company, Inc., and proceedings of the Ninth Annual Convention of the National Association of Broadcasters, p60.

[4] Listeners will recall that the President's address on Lincoln's birthday 1931, and his later address on the Red Cross, were announced as made on time of the American Tobacco Company programs. Another address was made a part of a Halsey-Stuart program.

[5] See the records of hearings before the Federal Radio Commission which involved state-owned broadcasting stations.

[6] See proceedings of the Ninth Annual Convention of the National Association of Broadcasters, p63, ¶ 8.

[7] This is a common practise at short-wave broadcasting stations, operating on experimental licenses, in connection with commercial broadcasting stations. See record of Federal Radio Commission's dealings with the shortwave station of the General Electric Company, Schenectady, New York.

[8] See Federal Radio Commission record of hearing on Radio Corporation of America licenses, following the conviction of the latter company for violation of the Clayton Act. 35 F [2d] 962 [D.C. Del. 1929] *aff'd*, 47 F [2d] 606 [C.C.A. 3d, 1931]; *certiorari* denied, 283 U.S. 847, 51 Sup.Ct. 493 [1931].

[9] See *United States v. American Bond and Mortgage Company* 31 F [2d] 448 [N.D. Ill. 1928]; *White v. Federal Radio Commission* 29 F [2d] 113 [1928]. Also see proceedings of the annual meetings of the National Association of Broadcasters.

Commercial Broadcasters to Intensify Lobby

THE COMMERCIAL RADIO monopoly interests have at last begun to realize that the American people are disgusted with glaring evils which have been allowed to grow up in American radio by a negligent and commercially-minded Federal Radio Commission.

The Couzens-Dill Resolution, calling for an investigation of commercialized radio, is the immediate cause of the alarm. Just as selfish street railway interests in Detroit sought to block Senator Couzens in his effort to protect the rights of the people to honest transportation, the greedy radio monopoly is seeking to thwart his efforts to secure an impartial survey of commercialized radio, looking toward the possibility of bettering conditions thru public ownership and operation.

The president of the National Association of Broadcasters has sent an SOS letter to its members. *He promises that replies will not be made public.* Here is the letter:

The passage of the Couzens-Dill Resolution by the Senate has presented to the entire broadcasting industry a new problem, which at the time of the annual convention of the National Association of Broadcasters in October was hardly apparent. The entire American Plan of broadcasting, based on private ownership and advertising support, is now definitely under fire.

This situation presents an opportunity for constructive work on the part of the National Association of Broadcasters such as it has never had before. It also presents the most serious danger which the American broadcasting industry has ever faced.

Obviously, if the National Association of Broadcasters is to do a real job, particularly in providing the broadcasting stations with material designed to present to the American public the real facts regarding the broadcasting industry, it has got to spend some money. This expenditure is clearly additional to any expenses which were considered when the budget for the current year was laid out. The Association cannot increase its dues, nor would it be desirable to do so if this were possible. It does not want to lay any additional burden on any station which cannot well afford to assume such a burden. At the same time, it wants to give every member of the Association a chance to take part in this tremendously important increase in the activities of the Association.

For this reason, under instructions from the Board of Directors, I am writing this letter to every member of the Association. We are asking each member to contribute, not as a special assessment, not as an increase in dues, but as a special contribution to meet a special emergency, whatever sum his station feels it can afford in order to safeguard the entire broadcasting industry of America in the face of this new attack. If you do not feel that under present circumstances you can contribute anything, please do

not feel that this will in any way affect your position as an active member of the Association. We know that some stations can afford to make contributions and will gladly do so. We know that others, which would be eager to help if they could, are in a position where they simply cannot do anything. We want to give every member a chance to help in this emergency work to the full extent of his ability and willingness, but we do not want to tax anybody. Furthermore, *we are not going to make public anything regarding the replies to this letter.* Accordingly, please write me frankly and tell me exactly what you think you can do in this situation.

If you can contribute it will help the cause of American broadcasting, and the more you can help, the better. If you cannot do so, we shall still feel just as strongly that you are with us in the battle against government monopoly as those who are just at present more fortunately situated. The Association needs your active cooperation even more than it needs your money. At the same time, the situation created by the Couzens-Dill Resolution is one which can be met only by an active campaign, and we want every member of the Association who can possibly do so to take part in this campaign to such an extent that its success will be certain.

Why are the broadcasters afraid?
Here is the Senate Resolution:

Whereas there is growing dissatisfaction with the present use of radio facilities for purposes of commercial advertising: Be it

Resolved, That the Federal Radio Commission is hereby authorized and instructed to make a survey and to report to the Senate on the following questions:

[1] What information there is available on the feasibility of Government ownership and operation of broadcasting facilities.

[2] To what extent the facilities of a representative group of broadcasting stations are used for commercial advertising purposes.

[3] To what extent the use of radio facilities for purposes of commercial advertising varies as between stations having power of one hundred watts, five hundred watts, one thousand watts, five thousand watts, and all in excess of five thousand watts.

[4] What plans might be adopted to reduce, to limit, to control, and, perhaps, to eliminate the use of radio facilities for commercial advertising purposes.

[5] What rules or regulations have been adopted by other countries to control or to eliminate the use of radio facilities for commercial advertising purposes.

[6] Whether it would be practicable and satisfactory to permit only the announcement of sponsorship of programs by persons or corporations.

[7] Any information available concerning the investments and the net income of a number of representative broadcasting companies or stations.

[8] Since education is a public service paid for by the taxes of the people, and therefore the people have a right to have complete control of all the facilities of public education, what recognition has the Commission given to the

application of public educational institutions? Give name of stations, power used, and frequency.

[9] What applications by public educational institutions for increased power and more effective frequencies have been granted since the Commission's organization? What refused?

[10] What educational stations have been granted cleared channels? What cleared channels are not used by chain broadcasting systems?

[11] How many quota units are assigned to the National Broadcasting Company and the other stations it uses? To the Columbia Broadcasting System and other stations it uses? To stations under control of educational institutions?

[12] In what cases has the Commission given licenses to commercial stations for facilities applied for by educational institutions?

[13] Has the Commission granted any applications by educational stations for radio facilities previously used by commercial stations? If so, in what cases? In what cases have such applications been refused? Why refused?

[14] To what extent are commercial stations allowing free use of their facilities for broadcasting programs for use in schools and public institutions? To what extent are such programs sponsored by commercial interests? By chain systems?

[15] Does the Commission believe that educational programs can be safely left to the voluntary gift of the use of facilities by commercial stations?

Why are broadcasters unwilling that Congress should consider without prejudice national radio systems which, in other countries, are yielding broadcasting companies net profits of from six to fifteen percent yearly? Why do they demand every air channel in the United States to force advertising into the home in an effort to control the lives of children over the heads of parents?

Why do they demand that no public official, from the President of the United States down, shall have the right to broadcast without being subject to the censorship of a corporation which the Supreme Court has adjudged guilty of violation of the Clayton Act—a corporation which the Department of Justice is suing to dissolve?

Why are commercial broadcasters planning to create a great lobby fund to thwart an honest inquiry which concerns the public intimately and vitally?

What right have these stations to use public channels, which have been assigned to them temporarily as trustees of the public interest, as instruments to thwart the honest efforts of Congress as it seeks to protect free speech?

American Leisure

IN THE LAST GENERATION there has been a decrease in the average working day of about three hours. This decrease promises to grow for a number of reasons. One reason, particularly, is due to what we economists call technological unemployment; whereby the machine, the time-study, the great merger, are moving down upon the industrial structure and displacing working men and women at an unprecedented rate.

It is quite obvious that the only long-swing solution for a situation like this—whereby we can produce the necessary food, shelter, and clothing in less and less time—is that the hours of labor should also follow the curve of the technical arts and that men should work less time. The use of leisure, accordingly, becomes increasingly important.

We see much of America's leisure devoted, not to first-hand participation, but to second-hand, or third-hand participation. A recent study has been made, by Mr. Lehman and Mr. Witty, of 13,000 school children in Kansas, children both rural and urban. They included boys and girls from ten to sixteen years of age. Altogether some 200 forms of play and recreation were listed. The children engaged in over 200 different sorts of things, but among the twelve most frequent were: reading the funny papers, motoring [which means at that age, of course, that somebody else drives you around], going to the movies, watching sports, listening to the radio, playing the phonograph. Six of the twelve most frequent forms were mechanized, were impossible to engage in without machines. And I call this particularly to your at-

tention, the most frequent form for both boys and girls at all ages was reading the funny papers.

THE TRAINING OF THE HUMAN PLANT—All animal life is sensitive to environment, but of all living things the child is the most sensitive. Surroundings act upon it as the outside world acts upon the plate of the camera. Every possible influence will leave its impress upon the child, and the traits which it inherited will be overcome to a certain extent, in many cases being even more apparent than heredity. ¶ The child is like a cut diamond, its many facets receiving sharp, clear impressions not possible to a pebble, with this difference, however, that the change wrought in the child from the influences without becomes constitutional and ingrained. A child absorbs environment. It is the most susceptible thing in the world to influence, and if that force be applied rightly and constantly when the child is in its most receptive condition, the effect will be pronounced, immediate, and permanent.—Luther Burbank.

We have here in the whole country something in the order of thirty million radio listeners a night. Fifty million people pass weekly thru the gaudy doors of our moving picture palaces. Thirty-five million copies of tabloids and newspapers are distributed every day, and fifteen million copies of the popular magazines make their rounds every month. Our pleasure motoring bill runs to the astounding total of five billion dollars a year.

Our whole bill for recreation [play,

very broadly defined] I have calculated at twenty-one billion dollars, which is about one-quarter of the national income.

The battle is on between people who know something about the essential values of life, and the high-pressure fraternity who want to pack leisure full of jumping-jacks. On one side, you have participating forms—mountain climbing, camping, gardening, naturizing, sunbathing, swimming, amateur acting, and books, good books.

On the other side, you have second- and third-hand forms: clicking turnstiles, Roman-stadia, burning up the roads, Hollywood, jazz, Coney Island, comic strips, wood-pulp confessions, and books, *bad* books—compounding the stresses and strains of our day-by-day work to a large extent.

In the field of commercial and mechanized goods, there are a number of very amusing and interesting things to do. We do not want to abolish this whole twenty-one billions of turnover. It is a case of selection, of proper balance, of not letting the high-pressure fraternity rush us, force us too hard.

Here in the United States we are like children with new toys, and must go thru a period of picking them to pieces, of examining them, of admiring them. In the end we are coming out on the right side, but it is going to be a long struggle. We are up against twenty-one billions of dollars devoted to commercializing and mechanizing our leisure time.—Stuart Chase, Labor Bureau, New York, N. Y., in the *Pittsburgh School Bulletin*.



Wholesome play means health, vigor, normality, cooperation, happiness.

The Jesuit Educational Association Speaks

WHEREAS the Jesuit Educational Association is an organization representing twenty-seven universities and colleges and thirty-seven secondary schools with a total student registration of approximately sixty thousand students, and

WHEREAS the use and development of radio as a medium for education is one of the important problems confronting educational agencies and institutions :

NOW THEREFORE BE IT RESOLVED: That the Jesuit Educational Association believes that the radio broadcasting channels of the United States should not be subordinated to the interests of particular commercial groups but that a reasonable share of these channels should be reserved and safeguarded to serve the educational and civic interests of the locality, the state, and the nation.

BE IT FURTHER RESOLVED: That this association commends the efforts of the National Committee on Education by Radio to further legislation securing to the people of the United States the use of radio for educational purposes.—Approved by the Eastern, Central, Western, and Southern Sections of the Jesuit Educational Association, January 15, 1932.