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SCIENCE

in the Madison Public Schools

Science in the Madison Public Schools

Philip H. Falk, Superintendent

Biennial Report

1954–56

Board of Education
Madison, Wisconsin

December, 1956

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Foreword

Science is remaking our world. For many centuries man eked out his existence, moved about, and communicated with others in much the same manner. Julius Caesar would have felt very much at home in George Washington's day. George Washington, however, would be hopelessly bewildered were he to come back to earth today.

The rate of change is accelerating. One needs only to think of the increase in harnessed power, speed of travel and automation, and electronic and medical advances during the past dozen years to realize that we are merely on the threshold of fabulous new inventions and discoveries. The impact of these products of research on society may be cataclysmic. Man must learn, before it is too late, to understand science, its social implications, and to make necessary social adjustments. Man must realize that he cannot enjoy the fruits of science in a horse and buggy society.

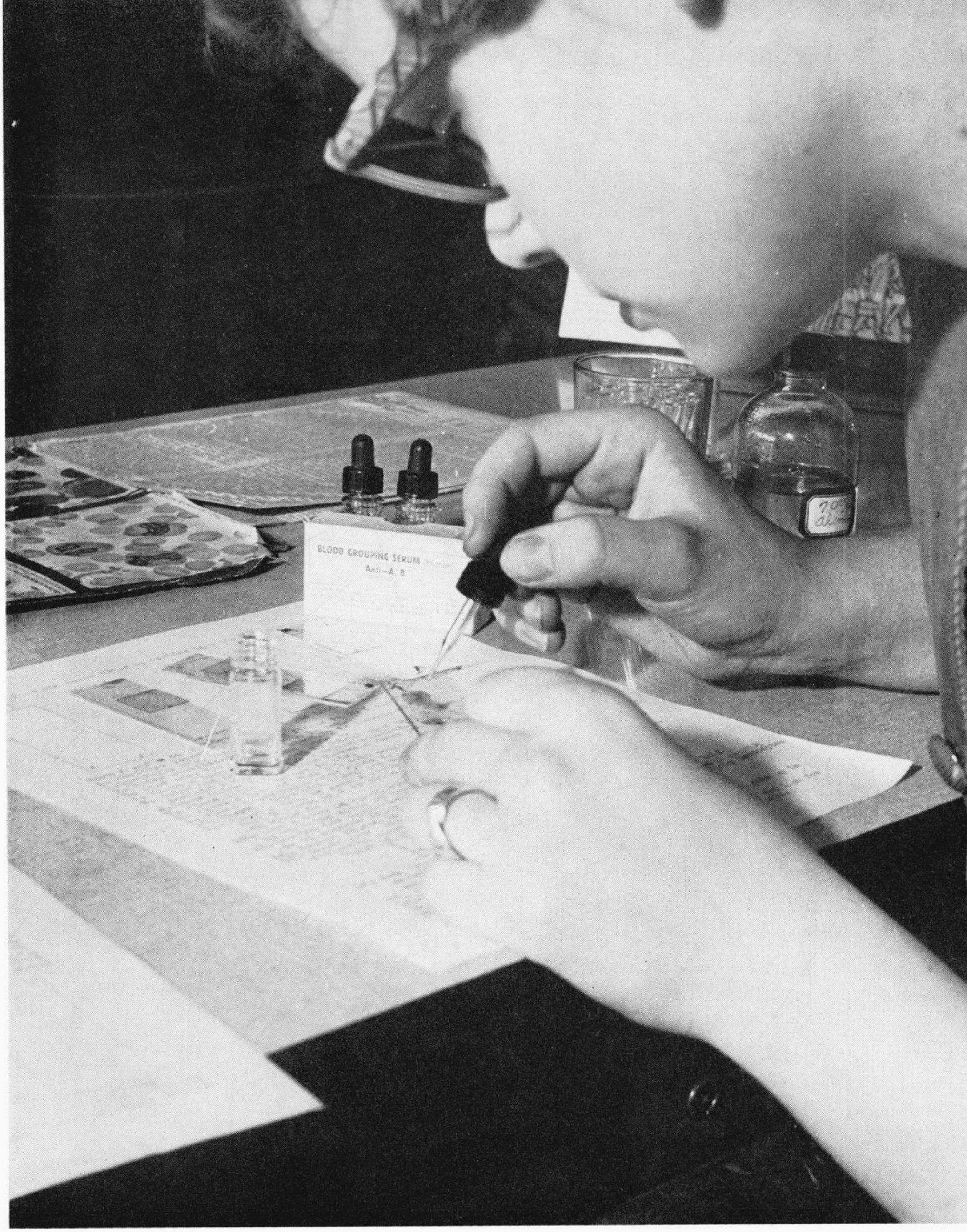
Obviously a field of learning which so vitally affects the lives of everyone—science—is a legitimate subject of study in the public schools. We need both scientists and citizens well versed in science and its social implications for survival in our modern world.

This report, *Science in the Madison Public Schools,* is one of a series including *Learning to Read, The Recreation Program, Guidance,* and *Art,* all in the Madison Public Schools. It was prepared by and we are indebted and grateful to a committee of the following teachers under the chairmanship of Lillian Simonson, principal of the Marquette elementary school: Mabel Hammersley, Harold Foote, Roland Sprecher, Robert Herreid, Gordon Burgess, and Henry Koehler.

It should be recognized that undergirding the splendid educational program depicted on the following pages is the work of an excellent, devoted, and capable Board of Education. All the final significant policy decisions pertaining to the operation of the Madison Public Schools are made by this Board. The contribution of the Board of Education to the educational program of Madison is gratefuly acknowledged.

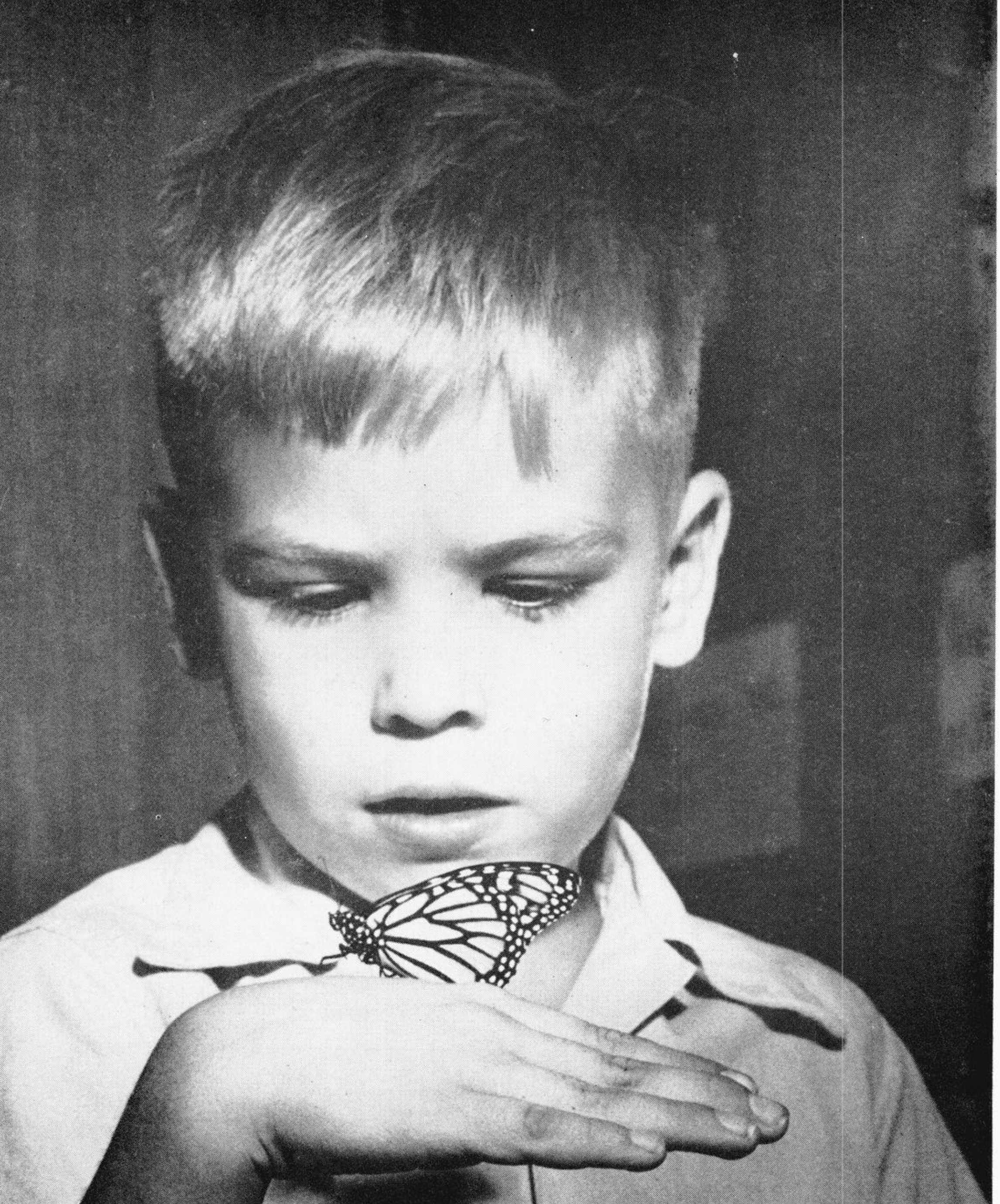
Part II of this report—For the Record—is a summarization of statistics, policies, and other significant actions of the Board of Education and staff during the biennial 1954–56.

PHILIP H. FALK



A future technician — maybe

Typing of blood is necessary in understanding transfusion.



A monarch is born!

The arrival of the first "king" of the butterfly world was an exciting event for David and his classmates, who had brought the caterpillars to school and watched them spin their cocoons.

SCIENCE IN THE MADISON SCHOOLS

Why We Teach Science

1. To help children better to understand themselves and the world in which they live.

A child's questions are a perpetual challenge. What makes me grow? Where do butterflies come from? How did stars get up in the sky. Why doesn't an airplane fall? What makes the wheels go 'round? Where does rain come from? These questions make us more aware that the world is awesome in its beauty and mystery, that man has made incredible discoveries to improve his way of life, and that there is much to be understood about this world of ours. As we think of the unanswered questions of children and the undiscovered truths in the world we are impressed with the teacher's responsibility to provide proper learning experiences.

2. To help children learn the scientific method in the search for truth.

Even primary children can develop powers of observation as they look, listen, wonder, and explore. They can discover cause and effect relationships by simple experimentation. And they can learn how important it is to attack a problem scientifically.

Steps in the problem method, then, are taught early in the elementary school. Children learn to identify and define the problem, think of a possible solution, find the facts needed to solve the problem, select those facts which can be proved to be true, test the solution or hypothesis, state the probable solution according to information at hand, and, if necessary, change the solution in the light of new facts. Children discover the need for using facts and principles established by scientists. To teach the scientific method is the responsibility of all teachers.

Children need to develop scientific attitudes and appreciations and understandings. They should appreciate the work of scientists, understand how scientific discoveries affect our lives, and value the importance of critical thinking. We hope children learn to feel respect for people who know more than they know, and that they learn to give responsibilities and recognition to others because of their ability rather than their popularity.

To help children reach goals in science education, adults need to keep alive the great desire that children have to learn through experience. Questions cannot be brushed aside. The simple words "Let's try to find out" can lead to a truly inspiring experience for child and parent, pupil and teacher, pupil and pupil. They can also lead children to high and continuous interests, to greater learning, and ultimately to more effective citizenship.

3. To help make better citizens and scientists.

A free nation must be strong. Strength may be developed by intelligent and resourceful action directed toward improving living for all peoples. For this we need not only trained scientists but also citizens who are aware of the importance of science and the part it plays in the world.

Our country needs more scientists. We must discover potential scientists early in school to give them the training they need in the humanities as well as in special scientific areas.

Tomorrow children as adults will be concerned with new drugs, synthetics, energy, and sources of basic materials. They will face personal, social, and economic problems arising from these discoveries. Tomorrow's laymen must have an understanding of the influence of science on man's life.

They must have been taught early to search for facts, to combat incorrect information, half-truths, bias, prejudice, and hysteria. They must have learned to use understanding to dispel fear. They must have become seekers of the truth in order to understand some of the problems of mankind and to desire to help their fellowmen.

The Science Curriculum

Certain basic concepts in science persist, yet are never completely mastered or controlled. They have to do with space, time, change, adaptation, variety, interrelationship, and the interplay of natural forces. Around them are shaped the important facts, principles, attitudes, appreciations, ideals, and goals that increase children's understanding of the world. Among these concepts are the following:

Changes occur continuously in the universe.
The earth is very old.
There are great variations in living and non-living things.
All life makes adaptation to the environment.
There is an interpendence of living things.
There is balance and imbalance in nature.

Pupils are helped in developing these understandings by many different experiences. They learn to read with understanding, to tell their ideas in clear oral and written speech, to use a specialized vocabulary, and to choose words which convey precise and complete meaning. They learn about symbols. They discover the importance of source materials, field trips, and visual aids. They discover a need for mathematics. Class experimentation encourages individual experimentation. And finally, science experiences themselves challenge pupils' imagination and stimulate their creative efforts.

Science in the Elementary Grades

Madison schools teach science continuously from kindergarten through sixth grade. For several years a committee of teachers from all grade levels tried to find answers to such questions as the following:

1) What understandings in science do children need?
2) In what aspects of science are children most interested?
3) What kinds of experiences are appropriate at different stages of development of children?
4) How may science learnings best be provided in the elementary school program?

The committee prepared bulletins to help teachers to teach in these basic areas: living things; weather, seasons, climate; the earth and heavenly bodies; air, water, fire; matter, energy, machines; electricity and magnetism; light; and sound. They also prepared bulletins on "The Teaching of Science—Why? How? By Whom?"; "Reference Materials for Science in the Elementary Grades"; "Desirable Outcomes of Science in the Elementary School"; and nine areas of the elementary science program.

The committee believed that:

1. Elementary school science should seldom stand alone. It should usually be an integral part of the school program, and be related to such other experiences as reading, social studies, writing, and spelling.

2. Science concepts and understandings should come from experience and should be related to problems of living.

3. An orderly development of science understandings, and an organization of subject matter into commonly accepted units are important.

4. Science must be taught in terms of present day happenings and discoveries as well as those of the past.

Science in the Junior and Senior High Schools

At the junior and senior high school levels there is an increased specialization of science. Problem solving in terms of groups and individuals continues to be emphasized. Extensive subject matter is integrated in definite areas. Senior high school pupils have increased mastery of mathematical subjects, and are therefore better able to handle the quantitative aspect of science. At this level also, pupils study more advanced theories about natural phenomena. Here science plays a dual role—for pupils who do not go beyond high school and for those who will go to college.

The junior and senior high schools offer science courses at specified grade levels. Science is required in junior high school—two semesters of general science in grade 8 and one semester of physiology in grade 9.

Science is an elective in senior high school, but in the college-preparatory course either science or mathematics is a requirement. Biology, chemistry, physics, and physical geography or earth science are electives in grades 10, 11, and 12. Two other sciences offered are agriculture at East high school and senior general science at West high school.

Following is a summary of a survey of 1956 seniors revealing the science courses they had completed:

Per Cent of 1956 Seniors Who Completed Science Courses in Grades 10, 11, 12

Subject	Central high	East high	West high
	%	%	%
Biology	50.3	48.4	62
Physics	27	23.7	40
Chemistry	35.7	38.3	40
Physical Geography (or Earth Science)	----	22.9	28

The changes in the science program of the Madison public schools are shown clearly by contrasting the present day curriculum practices depicted in this report with those of earlier days revealed in the "History of the Science Program" p. 137. Science education has progressed from observation and identification in nature study to the application of scientific methods in the basic science areas.

New scientific discoveries are reflected quickly in science teaching. Problems relating to electronics and nuclear energy have become a recent part of our changing curriculum. Automation, with its scientific, economic, and social aspects, is studied and students grow in interest, appreciation, and understanding of the scientific world in which they live. Good science teaching continues to emphasize content according to how it meets the needs of the child and society.

Summary

1. Science education begins in kindergarten and continues through high school in regularly scheduled periods or as an integral part of social studies, health, and safety.

2. Basic concepts are expanded continuously throughout school years; and children learn that concepts are never completely mastered or controlled at any level.

3. Science learning involves experiences such as: field trips, visual education, extensive reading and writing, experimentation, and computation.

4. Science experiences progress *from* observation, manipulation, and discovering cause and effect relationships *to* problem solving and an understanding of how principles are established and applied.

5. Science knowledge is best integrated in children's minds by solving problems which are defined in terms of social implications.

6. At the high school level, provisons are made for college and non-college students.

7. As students expand their horizons through new interests and experiences which lead to greater understanding, they develop scientific attitudes and problem-solving techniques which fit them for effective participation in a democratic society.

8. As a result of public school experience in science, a reasonable proportion of graduates may be expected to select some field of science for their vocations. The rest will be more intelligent adults for having discovered the importance of science in everyday living.

9. Basic aims of science education are in agreement with those of general education; but science makes specific contributions not found in other fields.

10. Science education for today's interests and needs and for tomorrow's laymen and scientists helps to insure a strong democratic nation and to improve living for all peoples.

Living Things

Man's wellbeing is directly improved by increasing what he knows of living things. In the last 200 years he has doubled the human life span in certain areas of the world through his knowledge of the nature of disease. Diphtheria, smallpox, and yellow fever have been brought under control. There is hope that polio will be prevented through the use of Salk vaccine. Many diseases have been conquered.

In much the same way that man has used his knowledge of disease, he has applied his knowledge to improve domesticated plants and animals. Plants have been made more beautiful and have been developed to produce larger yields; and animals have been improved in quality and size.

In the elementary school, children first learn about animals by playing with their pets and listening to nature stories. Later, field trips to farm and zoo give them more information. Watching fish as they swim about in an aquarium, observing tadpoles as they change into frogs, and noting the sprouting of seeds as they change into seedlings are all experiences which tend to build up a fund of information about living things.

In the junior and senior high school pupils learn about the wide variety of plant and animal life in the world, and the orderliness in which they fit into certain groupings. The microscope makes it possible to learn the true nature of living things.

Their understandings are enlarged and expanded as pupils progress from one school level to another. They learn that living things get food, digest food, breathe, and move in much the same way. They learn that living things are constantly changing, that the rate of change is very slow, and that extensive changes have occurred in the many years that living things have been on the earth. They learn that these changes have occurred through the study of fossils, earthquakes, and glacial action.

Through an understanding of conservation problems children realize that natural resources are exhaustible, that natural resources may be wasted, but that resources of living things are replaceable. Conservation takes on more meaning when they know that to conserve means to use, renew, and even to improve resources, and that they, as well as adult laymen and scientists, are responsible for conservation.

In the study of living things, children often acquire interests which develop into a wide variety of avocations or which lead to vocations or professions.

At a turkey farm

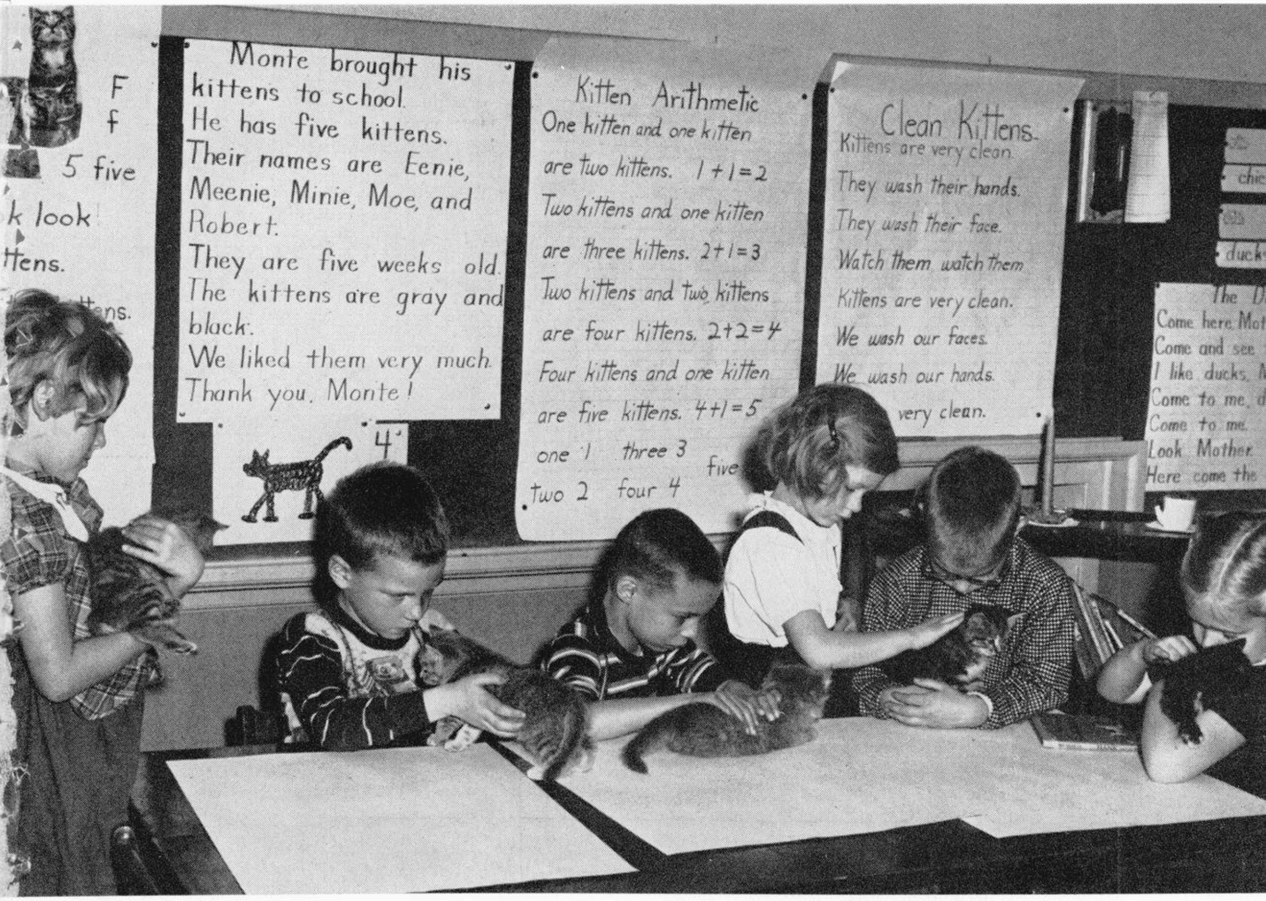
In a trip to a turkey farm kindergarten children observe a turkey at close range.

Young life

In the kindergarten children watch chicks peck their way out of their shells. Sometimes a mother hen or an incubator is brought into the classroom, and children care for the baby chicks until time comes to give them to a farmer.

A trip to the pet shop

Pupils in the first grade increase their understanding and appreciation of animal life by a visit to a pet shop, where a worker tells of his love and understanding of pets.



Kittens at school

Care of pets teaches children many things about animal life. The charts show that these kittens contributed to the study of language and arithmetic as well as science.

"When I grow up, I'll be a farmer."

One of the highlights of second grade is a trip to the dairy farm. Some of the children have never been on a farm.

"I think mice
Are rather nice."

Third grade pupils peep at tiny pink babies which were born in their classroom. They had been hosts to the mother mouse since the first day of school.

From tree to ball

Third grade children trace what happens from the time latex is gathered in the forest until it becomes their own rubber ball.

The cactus garden

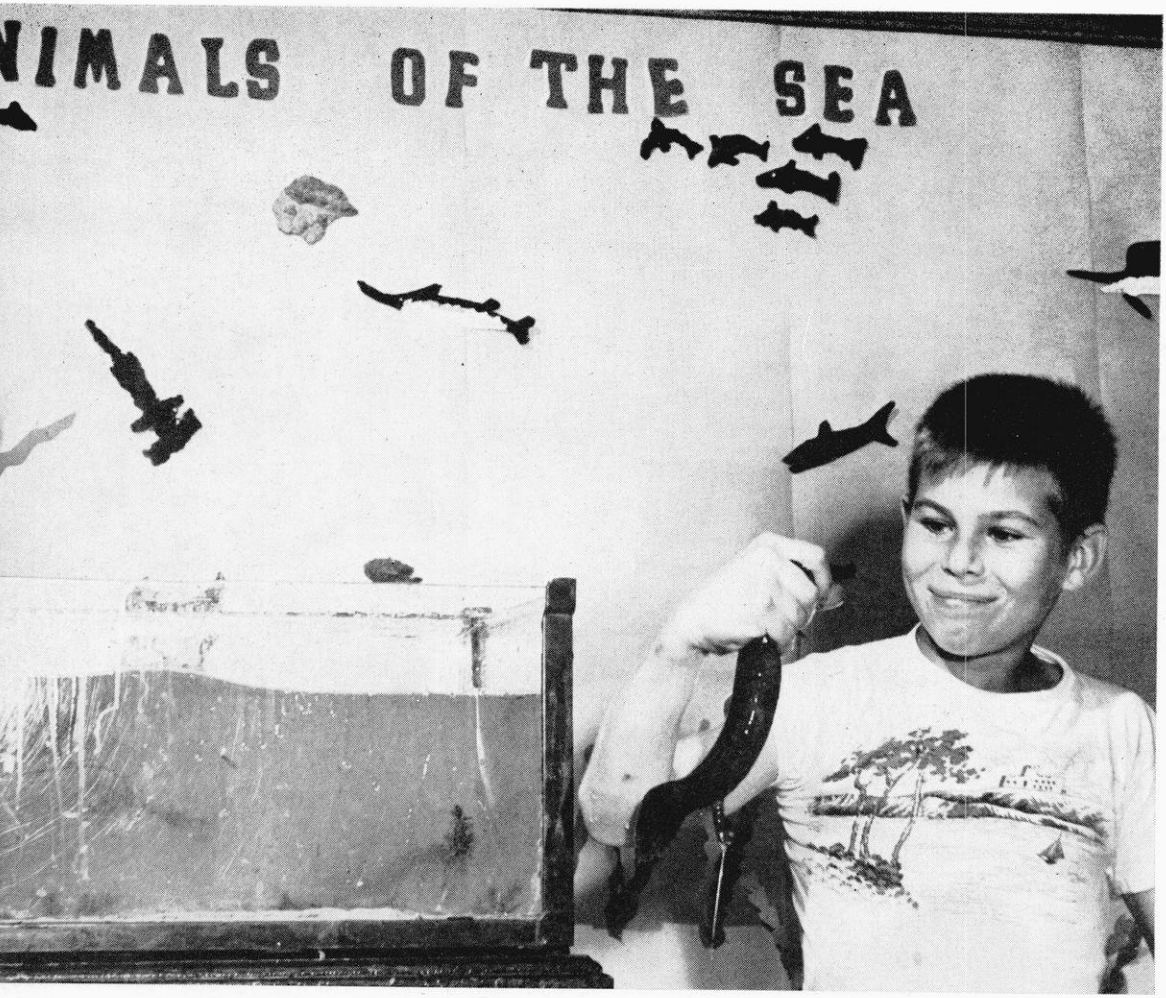
Keeping a cactus garden is a good way for children to understand how plants adapt themselves to their environment.

Picking cotton

Growing cotton and flax in the classroom leads third grade children to the study of synthetic fabrics.

Experimenting with plants

These sixth grade girls study plants grown under different conditions. They observe what happens when seeds are planted too deeply, when the water supply is scant, and when soil content varies. Differences in leaves and roots are more obvious when viewed through a microscope.

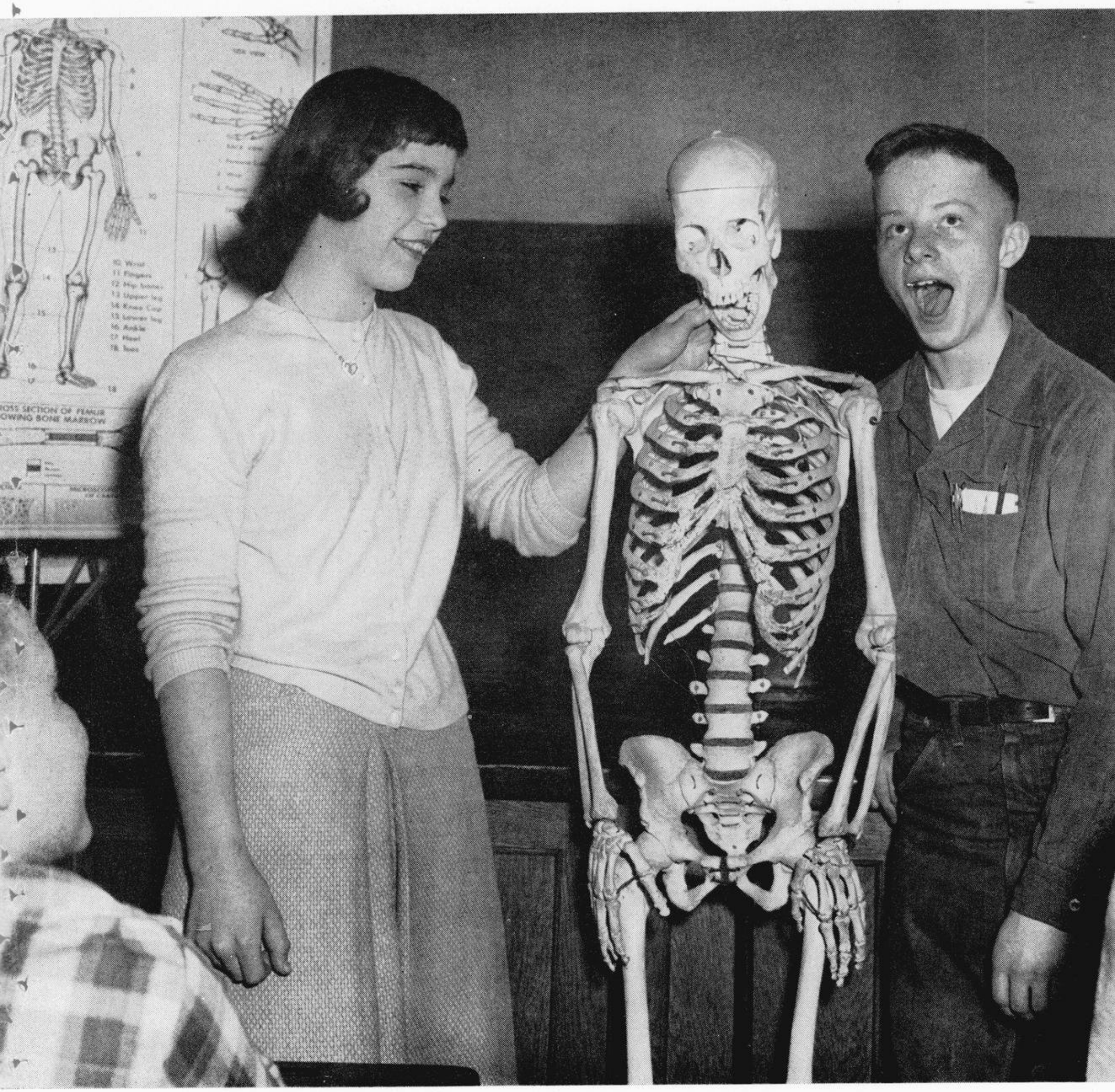


Live specimen

In the study of the development of animal life, Doug shows a mud puppy to the class and explains that it has a backbone, fins, and foot-like formations.

"The jaw bone is connected to the head bone."

Pupils like to memorize the names and position of the main bones in the body, and the study of physiology provides the opportunity.

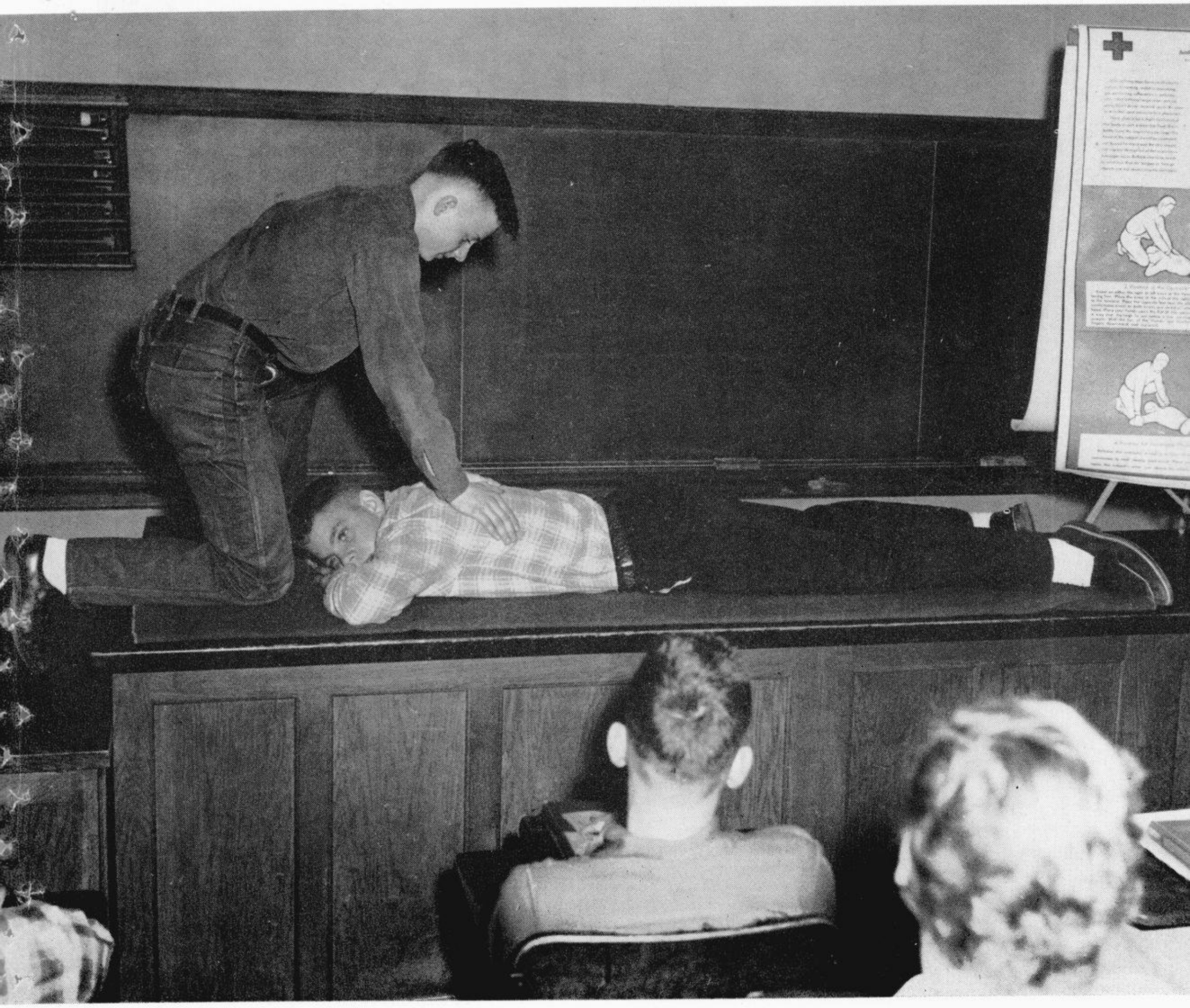


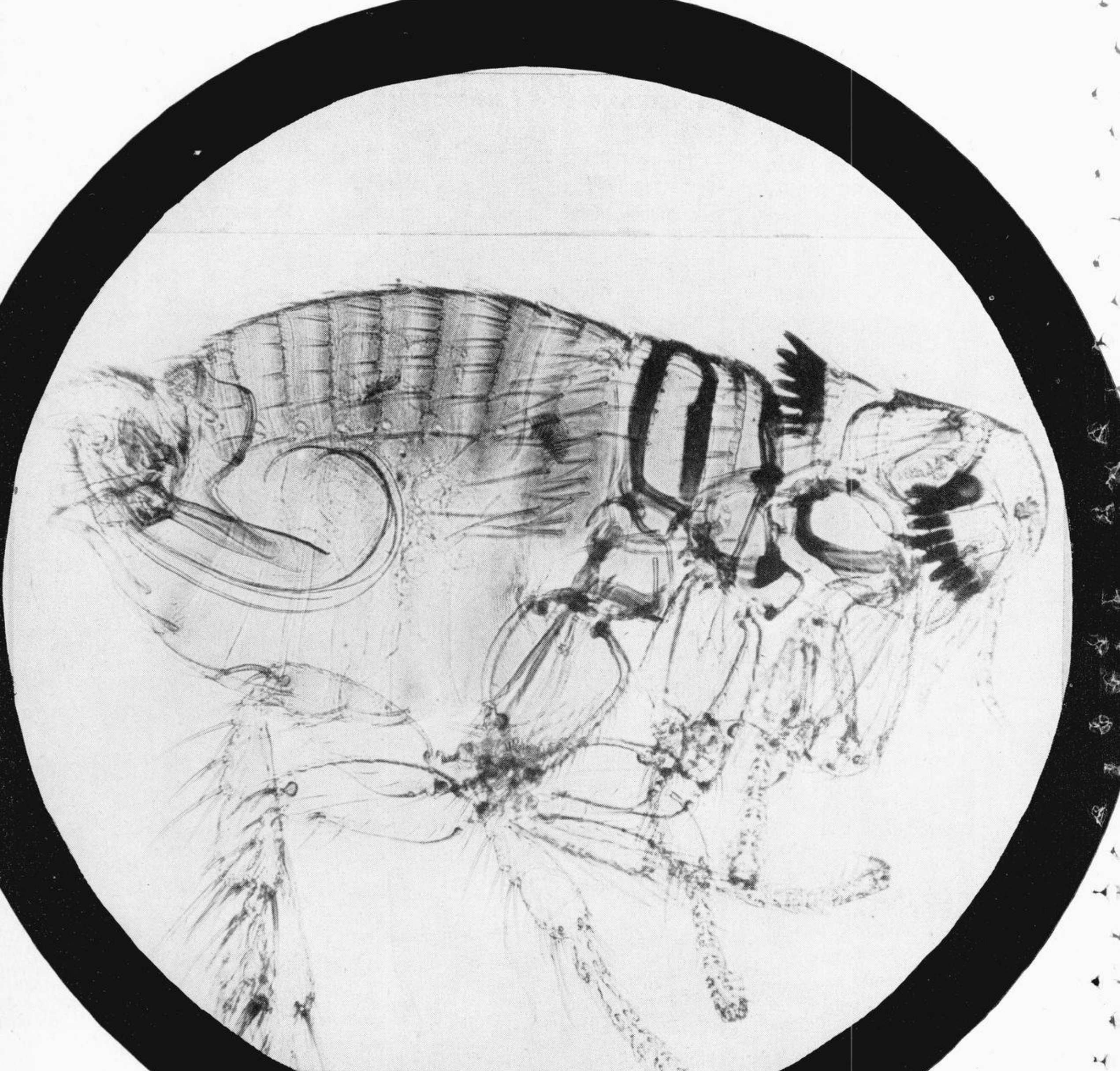
"Humphrey" comes apart.

One part of the study of physiology is the human body. This plastic torso shows the actual size and location of parts of the body. All pupils have the opportunity to take the torso apart and put it together again.

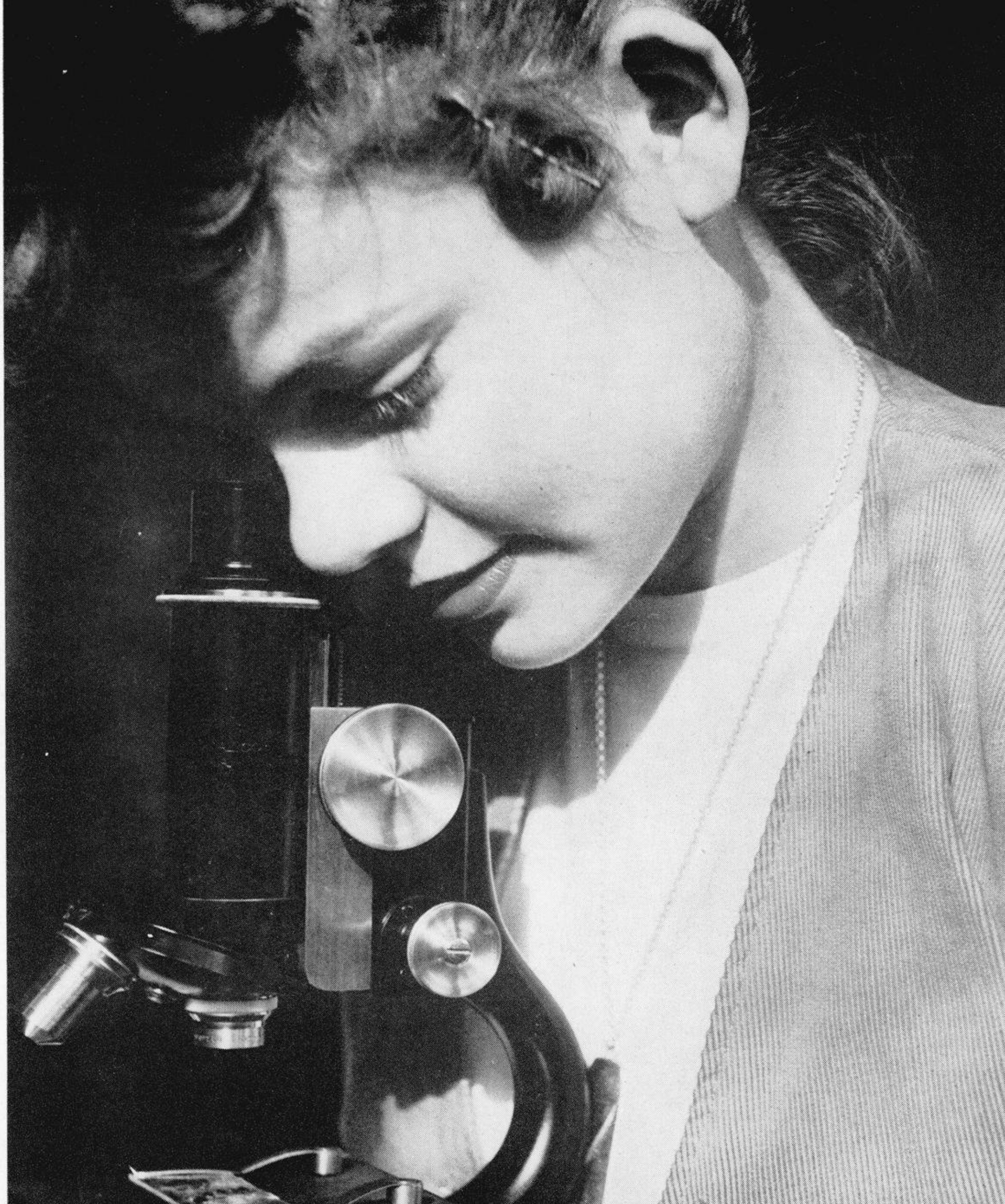
Practice today may save a life tomorrow.

Boys take turns in class learning the mechanics and proper rhythm of artificial respiration. Girls as well as boys are advised to practice this first-aid method with their parents at home, repeating the performance every six months.



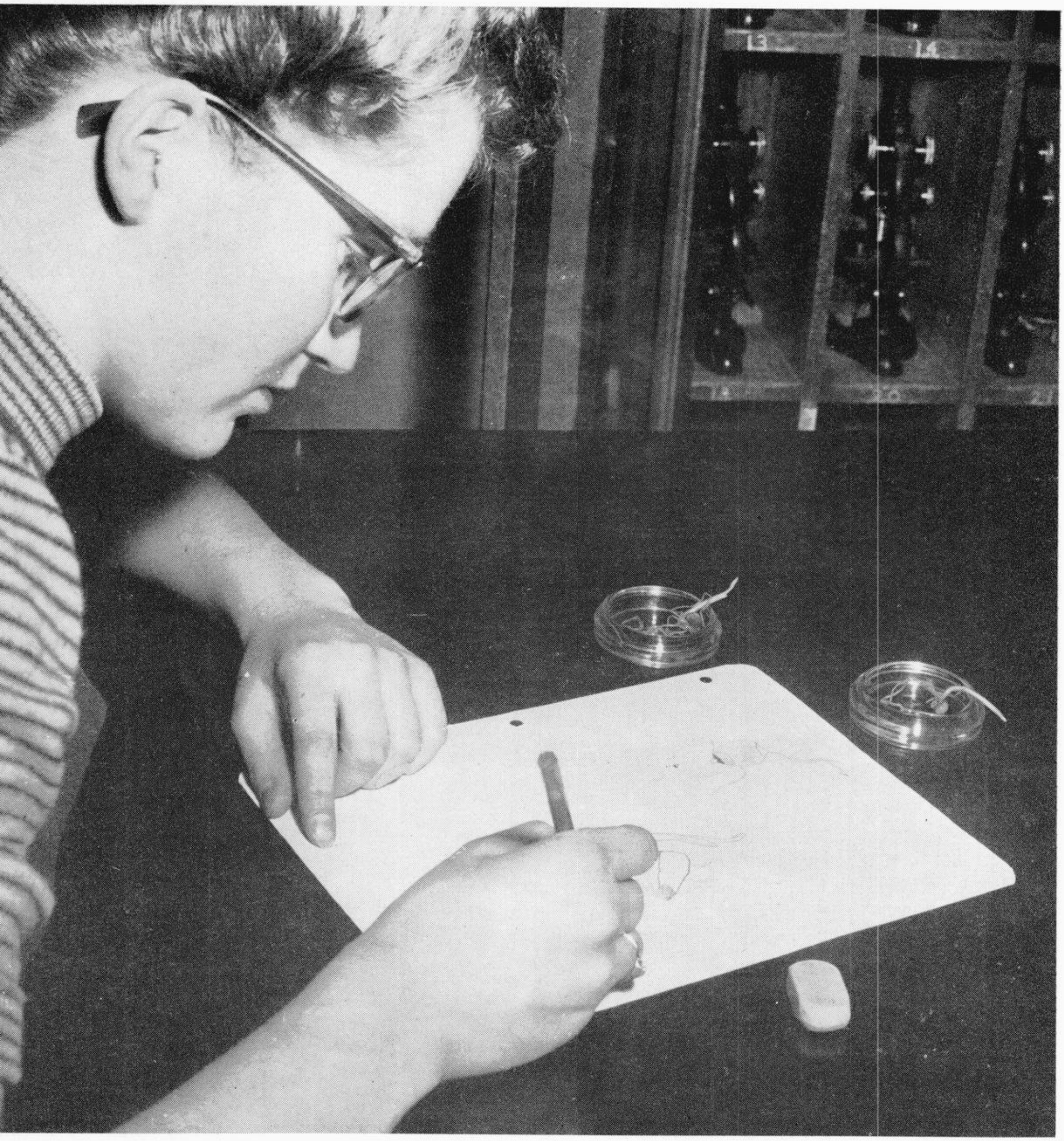


A rabbit flea



Microscopic revelations

Valarie examines a rabbit flea through the microscope. Teachers encourage students to seek and understand things beyond the limits of normal vision.



From seed to seedling

Judy makes sketches to help her remember interesting changes that occur when a seed changes to a seedling. Germination is a complicated process in the development of the plant.

Controlled plant growth

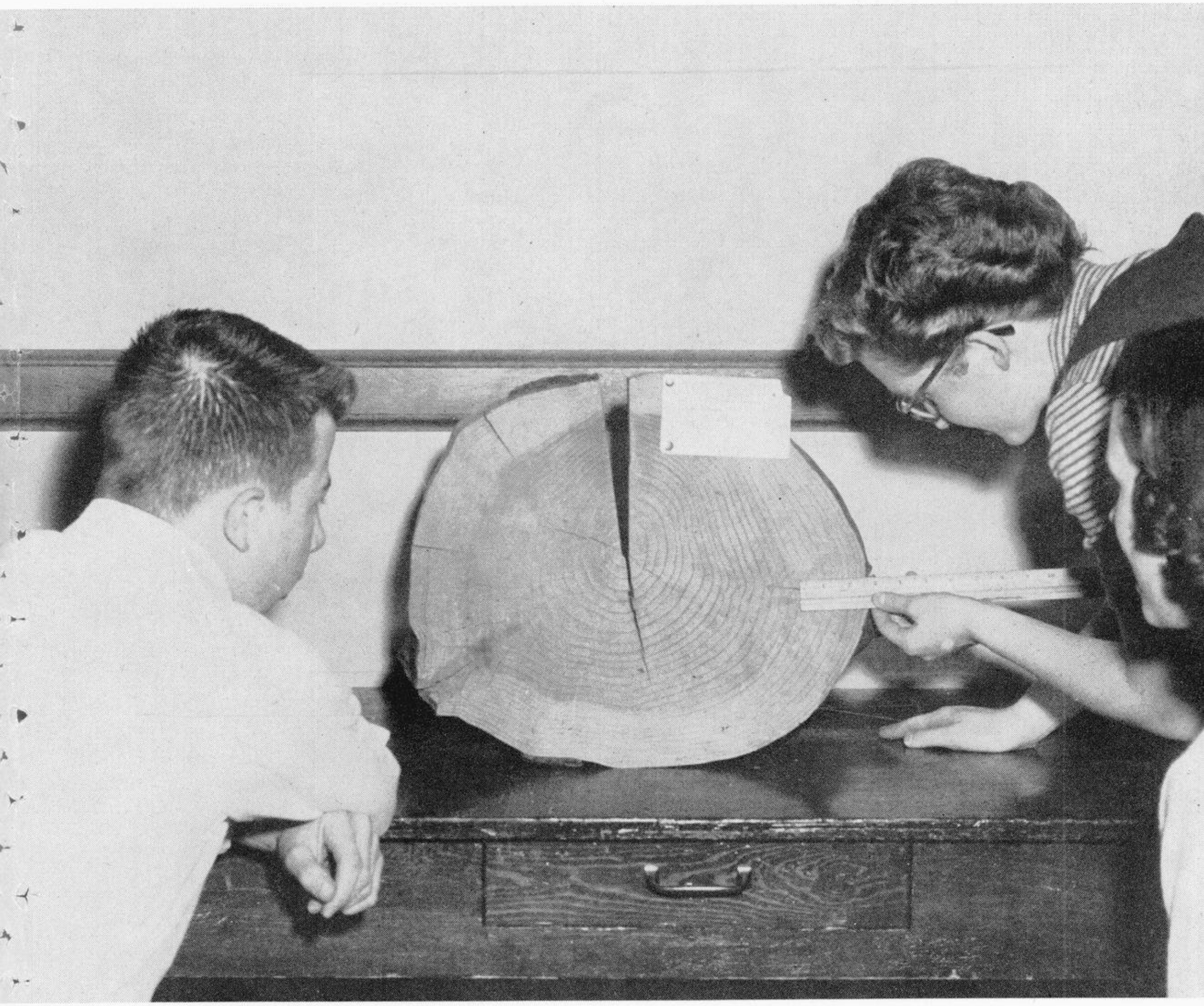
The experiment illustrates how variations in light, food, water, and temperature affect plant growth.

A greenhouse experiment

The greenhouse is a year-around laboratory that gives pupils the opportunity to carry on controlled experiments in plant growth and to observe all steps in development.

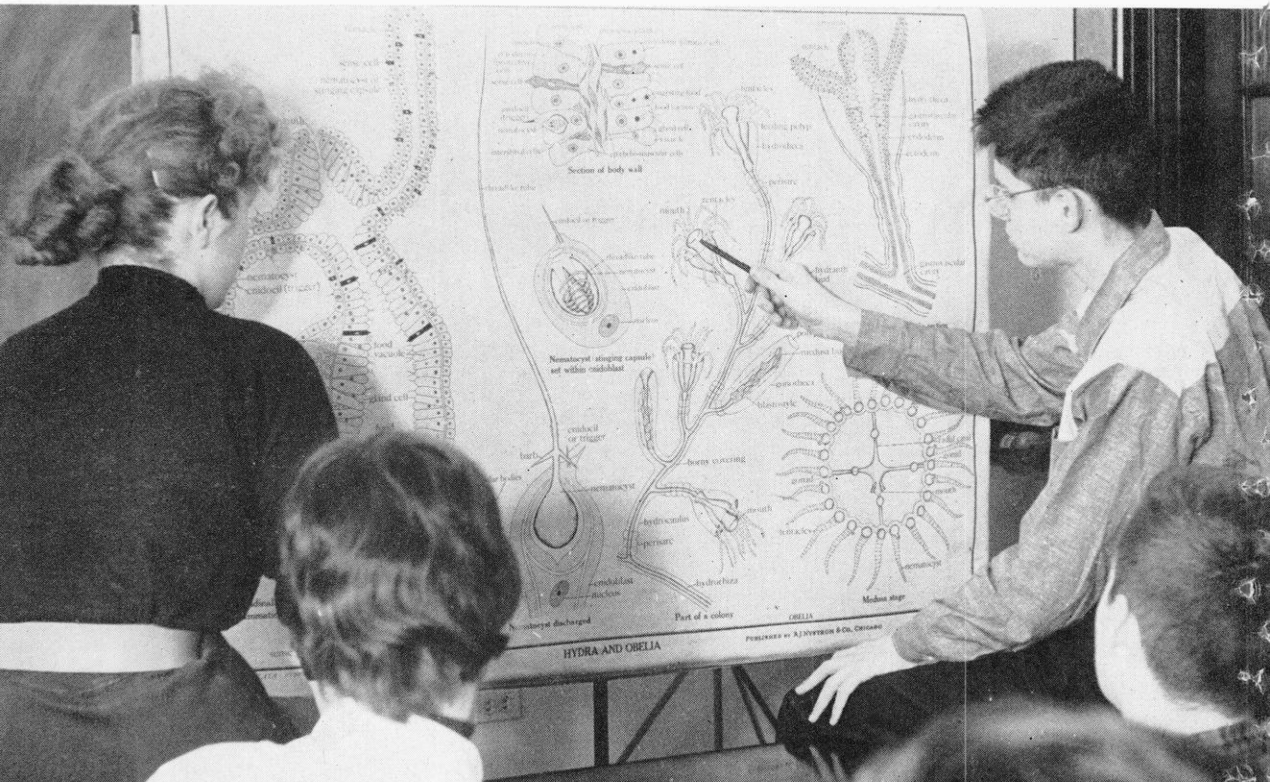
Annual rings tell a story

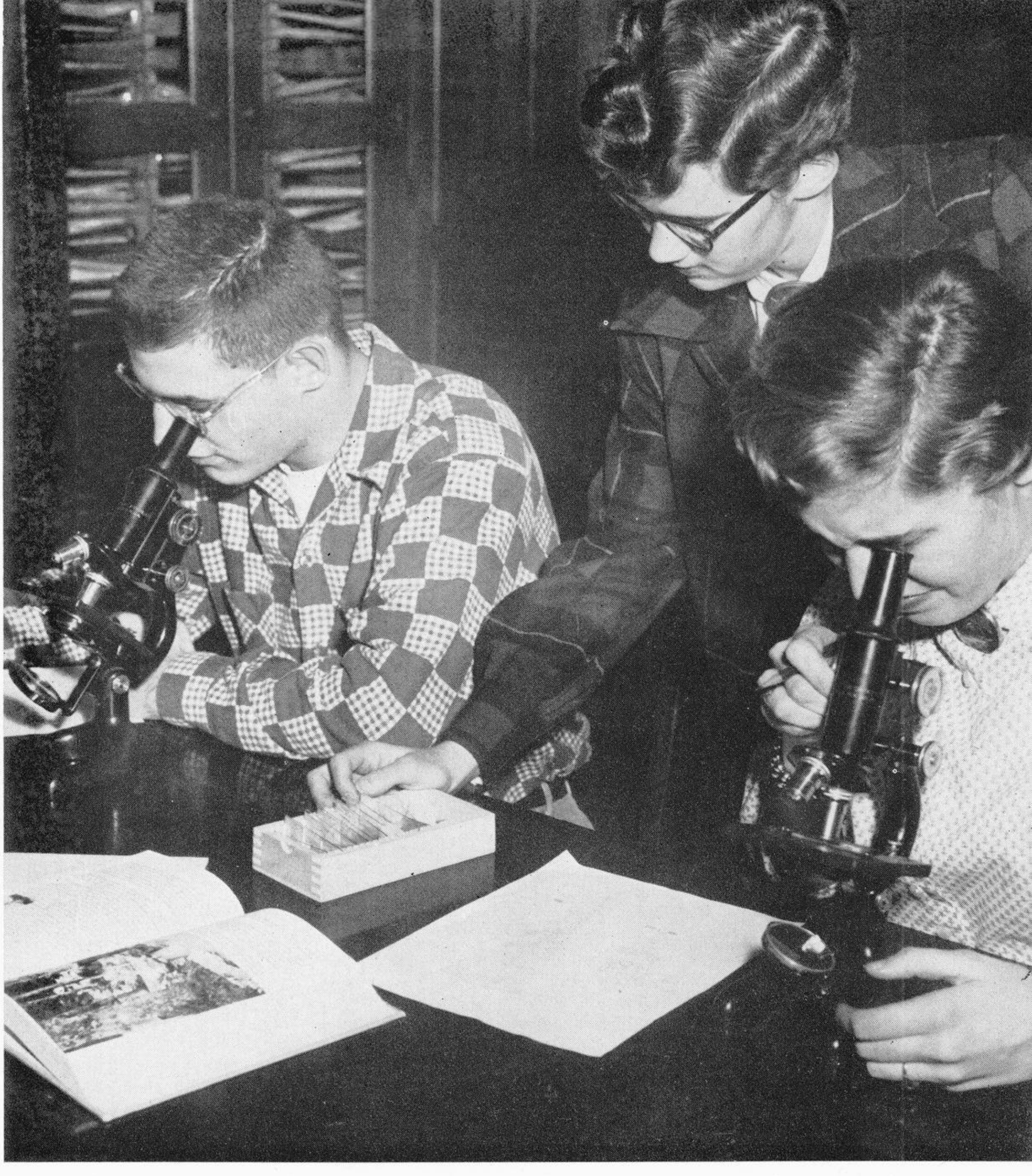
Students can tell the age of a tree by counting annual rings. They observe that the rings differ in width and discover through reading that environment, climate, and organisms all affect the growth of a tree.



The life cycle of a hydra in graphic form

The hydra is used as an illustration of the beginning of the digestive system as well as the nervous system.



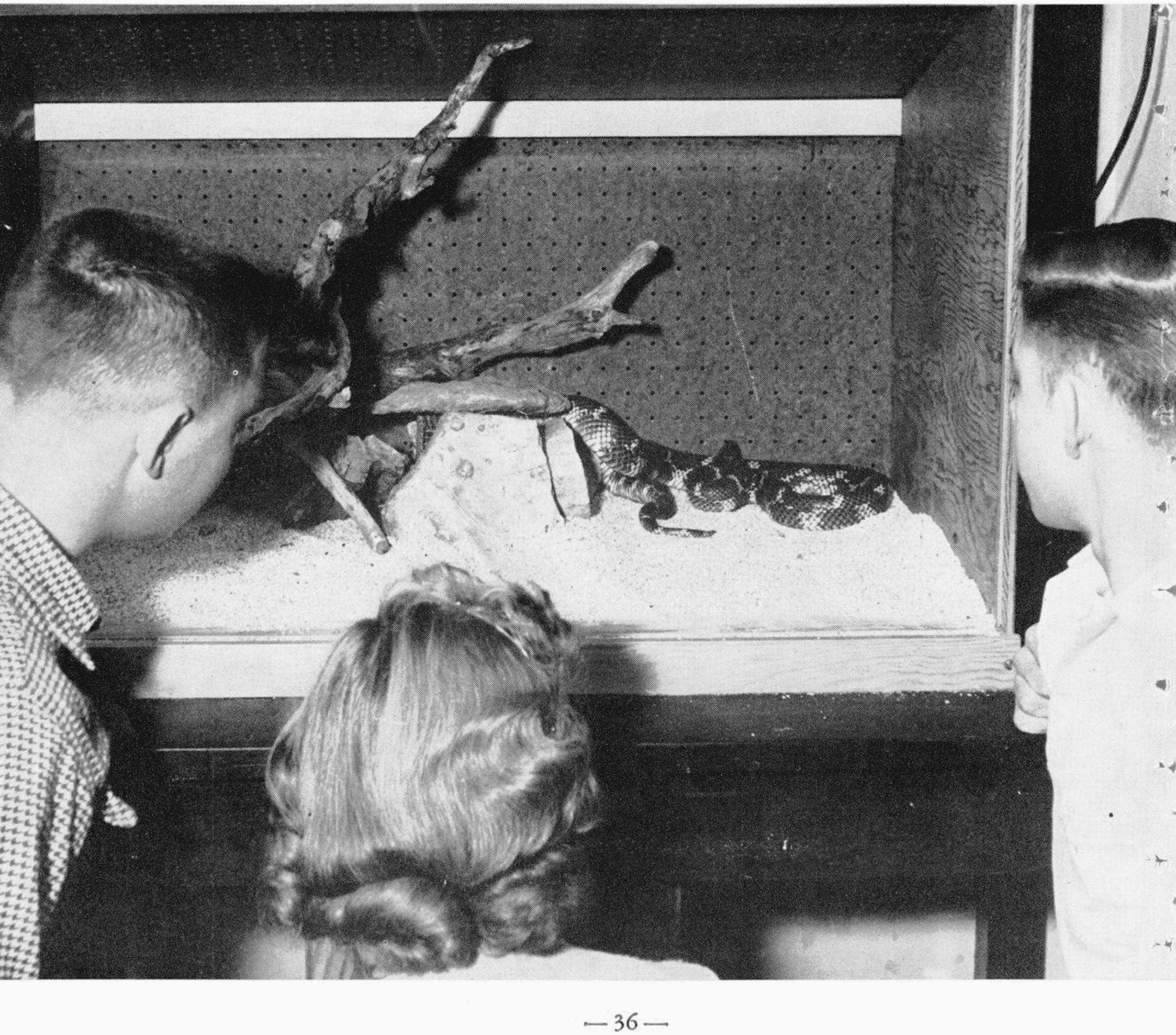


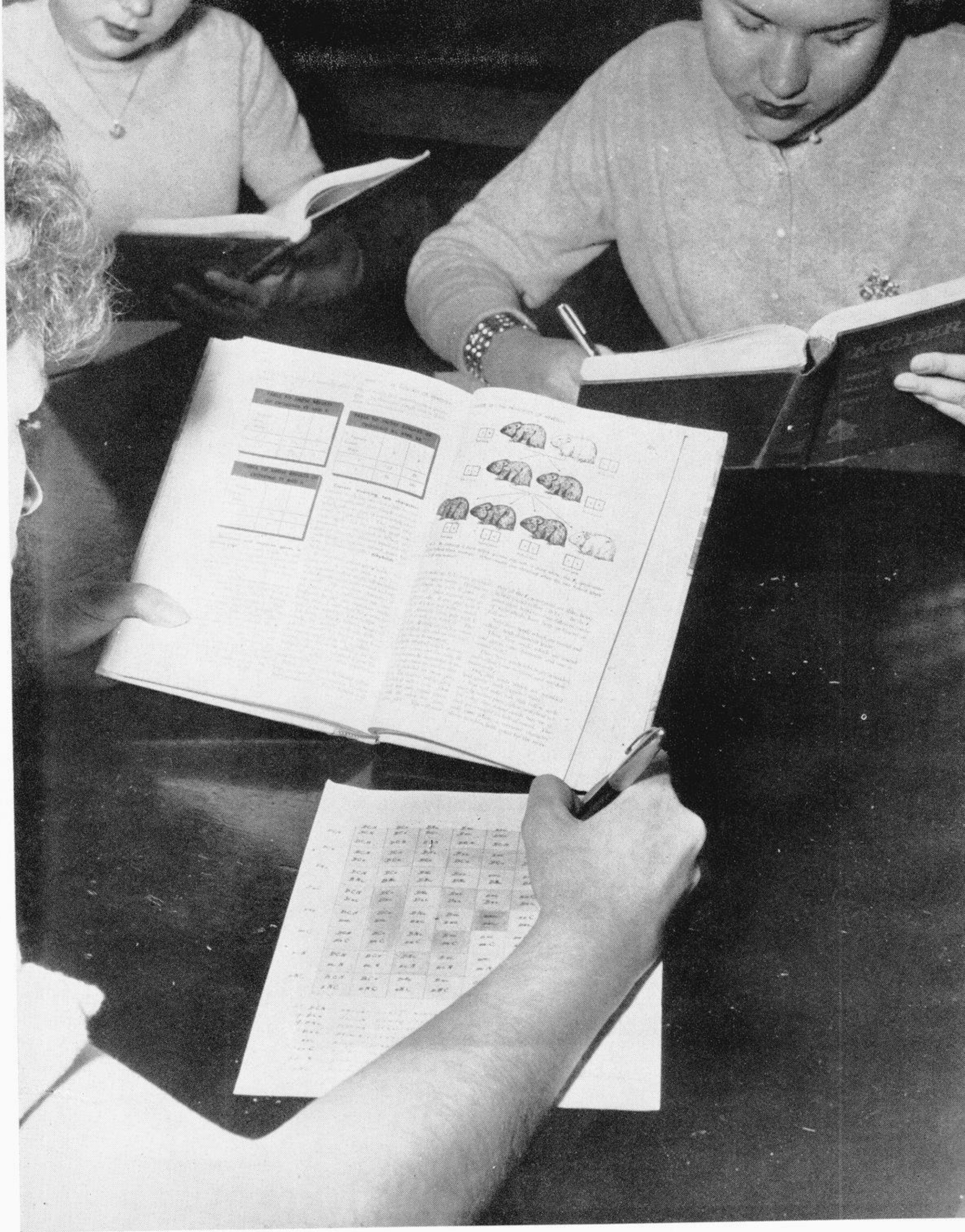
The wonders of the unseen world

Students learn that the microscope helps to solve many important problems in biology.

Snakes are important in the balance of life.

Pupils discover in their study of biology that snakes are beneficial, by consuming large numbers of rodents and insects. Wisconsin has only one poisonous snake, the rattlesnake, which is found in very few areas.





Mendel's laws

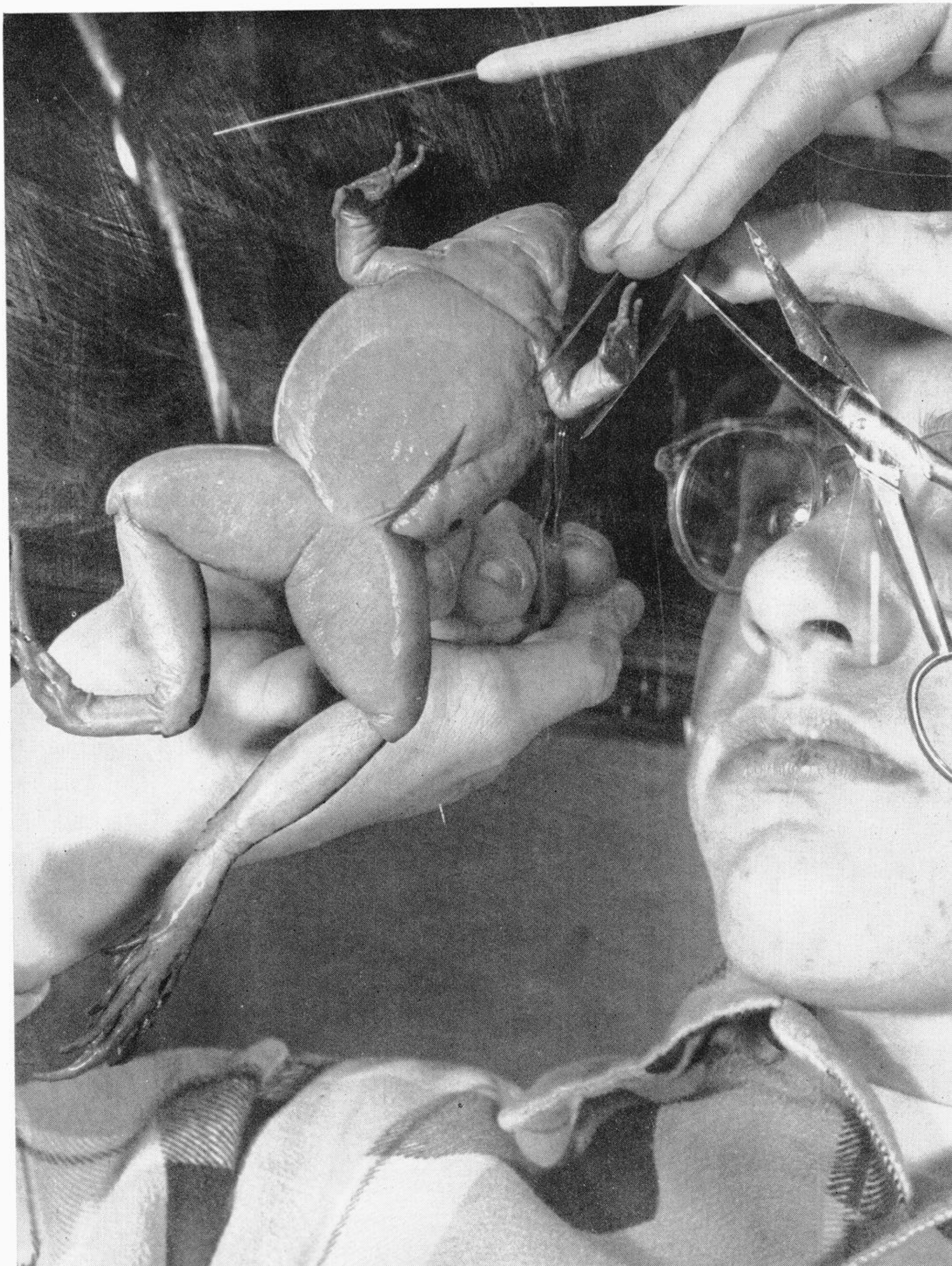
The law of heredity, whether they apply to plant or animal life, make fascinating study for most pupils.

Do you know your blood type?

One part of the biology experience is to learn how to type blood. Many lives are saved because of the availability of a blood supply that is already typed.

The dissection of a frog

Since the anatomy of all vertebrates is similar, a study of the lower animals helps in the understanding of the human body. Through the extensive study of the frog, pupils learn about the circulation, respiration, and nervous system of their own bodies.



Weather, Seasons, Climate

"Clouds are the sky-writing of the weather", muses Jerry as he looks into the nephoscope he made. And the writing tells an ever-changing story. Reading the story of weather involves the study of truly astonishing things such as rockets, the jet stream, huge balloons, electronic machines that make complete weather maps, as well as the work of scientists who can tell what is happening 1,000 miles away or 40,000 feet up.

Since weather affects people in a very personal way, problems of weather are always absorbing. Some are based on mere curiosity: Who were the first rain-makers? Why is an air mass said to have a "front"? Others are of real scientific significance: How do changes in air pressure predict weather changes? What happens when different air masses meet?

Many of these problems are raised by children who are fascinated by both the facts and fancies regarding the weather and are challenged to separate one from the other. What degree of truth is there in such a statement as "Rainbow at night, a sailor's delight"? Or "When ditch and pond offend the nose, look for rain and stormy blows"?

They find their answers in a variety of sources. In books on weather, seasons, and climate, they read proverbs and weather-lore legends, writings by poets, philosophers, social scientists, and psychologists, and they read about scientific discoveries.

Again, it is a trip to a weather bureau that settles an important problem and stimulates new interests. Making weather instruments and predicting weather is a project which gives every child an opportunity to manipulate, experiment, and make a contribution to the group at his own level of ability.

Following problem-solving techniques is a more scientific way of solving problems. For example, a fifth grade group used this method to answer the question "What does it mean when people say it isn't the heat; it's the humidity"? The following steps were followed:

Defining the problem: Does a lot of water vapor in air make one feel cool or warm?

Probable answer or hypothesis: One feels uncomfortable if perspiration does not dry off rapidly. Testing the hypothesis: Children made a wet- and dry-bulb thermometer. Examination of evidence: They discovered that the wet bulb was cooler because the change of water to vapor calls for heat, and some of the heat in the bulb is lost in evaporation of water from the wick.

Conclusion: They decided that the hypothesis was correct as far as it went, but that some body heat was lost in the evaporation of perspiration. Thus people are partly right when they say "It's not the heat; it's the humidity."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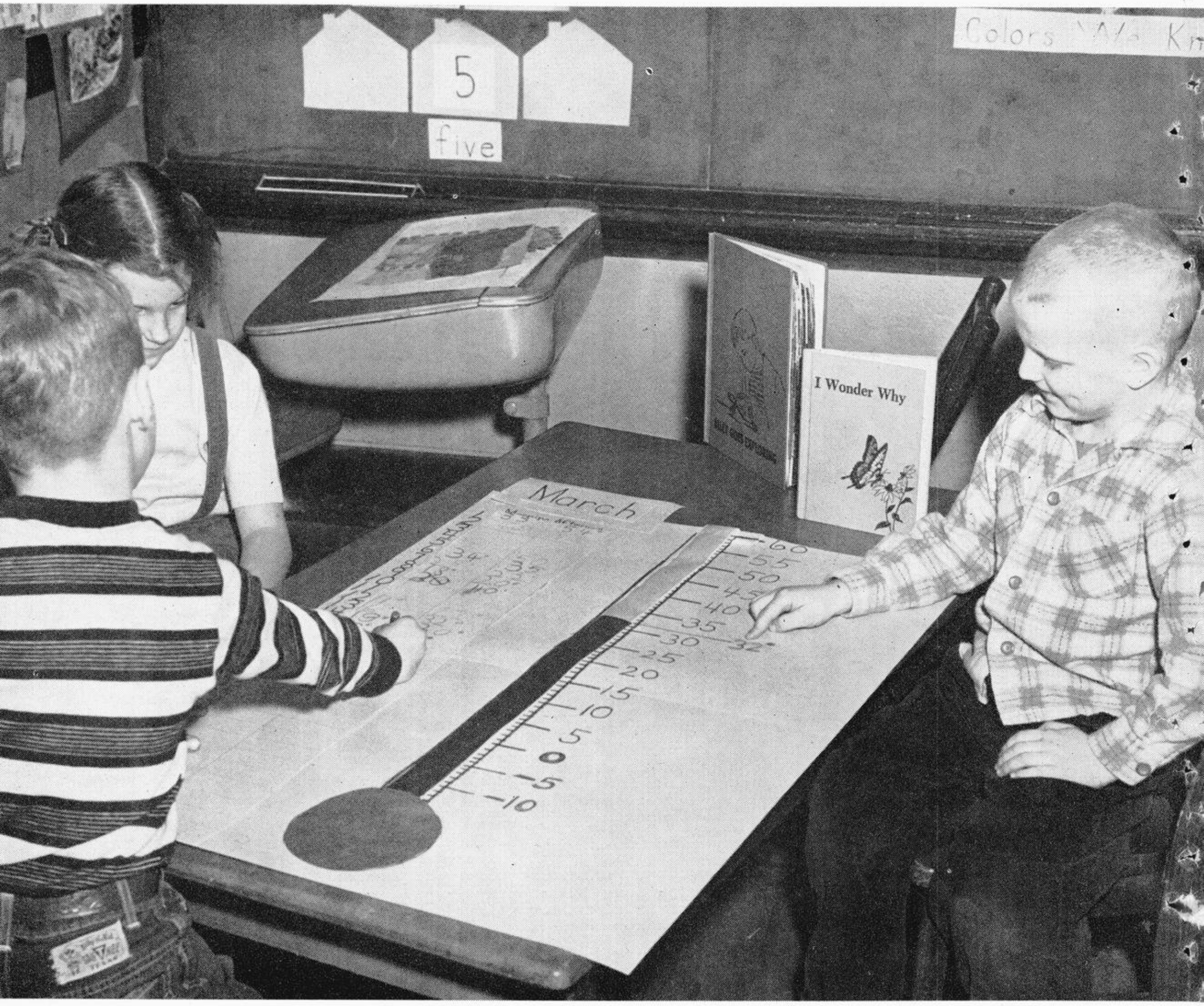


Keeping track of the weather

The big "thermometer" gets daily attention in first grade. The red part of the band is pulled up or down, according to changes reported each day.

Our daily weather report starts here.

Children satisfy their curiosity by viewing the inside of an instrument shelter at the Truax Field weather station. They learn that several regular weather recordings are made each day.

"How fast does the wind blow?"

Gary tries out the anemometer which Andrea made while the children were studying about the speed of wind.

"Stormy or fair weather?"

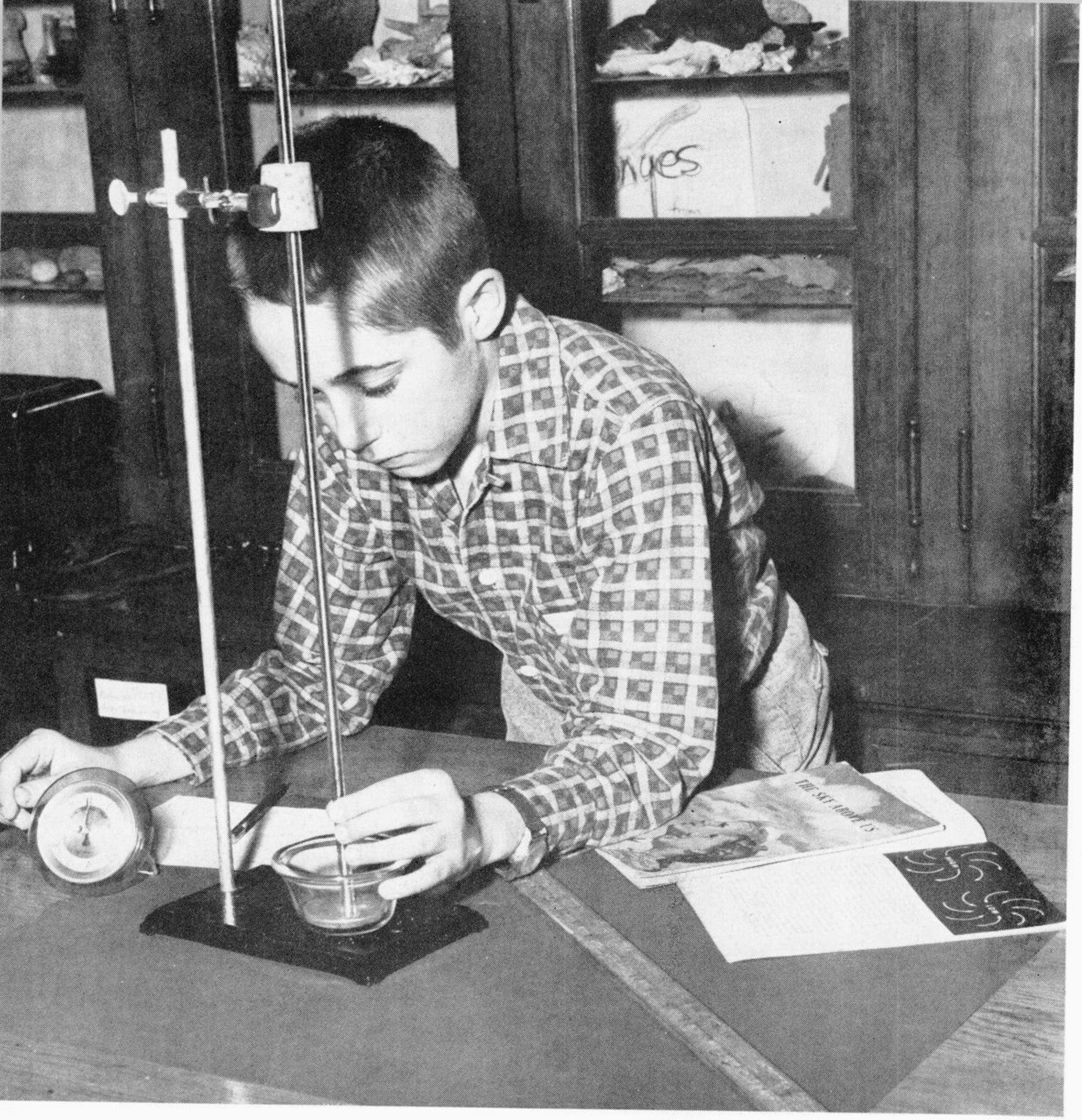
Interest in the weather led the boys and girls to team-up in their search for information. Each group chose one condition of weather on which to report. Many of the children made their own weather instruments. Joann demonstrates how her hygrometer shows the humidity in the air.

Finding due north

To learn which way the wind blows, children need to know directions in terms of the compass. They found true north by using an upright stick and placing another stick on its shadow. The stick on the ground points north when the shadow is shortest.

It isn't the heat; it's the humidity.

This hypothesis was verified when fifth grade pupils constructed a wet-and dry-bulb hygrometer.

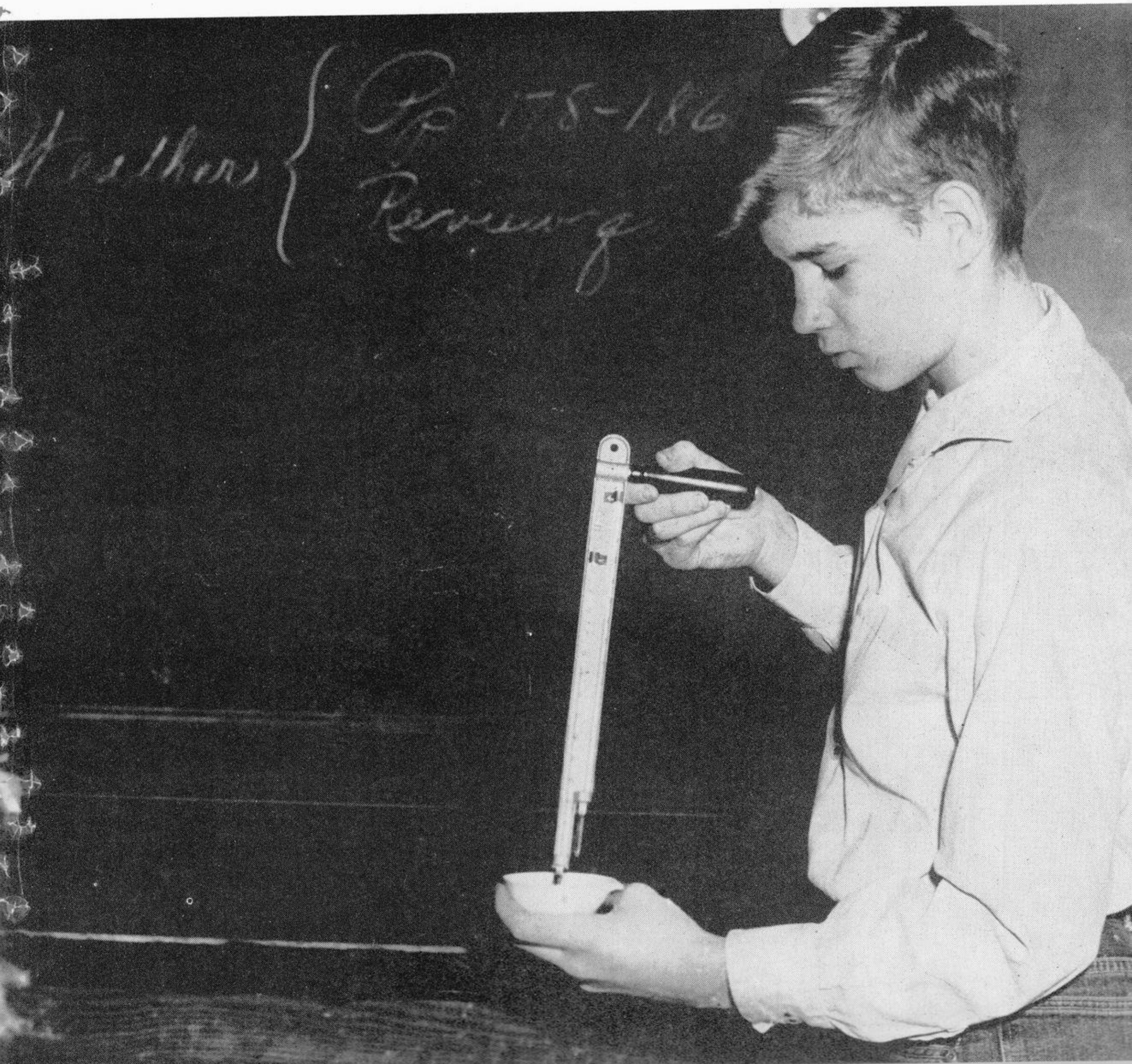


Making a mercury barometer is easy.

David makes a mercury barometer while studying about air pressure. By taking frequent readings with a yard stick, he learns that air pressure varies with atmospheric conditions. He discovers that low readings indicate a greater quantity of water vapor in the air.

High humidity causes discomfort.

Peter finds that it can be uncomfortably warm when the relative humidity is high even though the temperature may be as low as 75 degrees F. The psychrometer indicates the humidity through the cooling effect of evaporation of water.



The Earth and Heavenly Bodies

Jenifer has learned that "the world is really round" and big and beautiful. In her early school days, home was the center of Jenifer's small, flat world, which stretched a few blocks in each direction and included school, church, and shopping center.

Her horizons were enlarged as she progressed through the primary grades and learned more about homes, food and clothing, and community helpers.

The skillful teacher guided her interest from home to community through neighborhood excursions, discussion, and other group activities. The children made models of their homes and a map of their classroom and community, thereby gaining a sense of space and placement and direction.

No doubt a globe gave Jenifer and her classmates their first idea of the roundness of the earth and its division into land and sea, and of foreign nations, and "our own United States".

Later possibly, visitors or objects from foreign lands opened new vistas to Jenifer and her friends and led them in search of information about the far places in the world.

The children studied about the earth and its surface and the changes it undergoes in the passage of time. They learned about rocks and soil and the effect of weather, wind, and water on the earth.

From the earth to the stars was but a jump in the children's quest for knowledge. They studied the sun and moon, the entire solar system, and many of the constellations that make up our galaxy. They made a simple planetarium to demonstrate the revolutions of the earth around the sun. A trip to the observatory added to their understanding of time and space.

Senior high school science courses now enable Jenifer and her classmates to delve more deeply into the study of the earth and its crust, living things on the earth and in the sea, rocks and minerals, elements and compounds, and man's use of nature's forces.

For example, in physical geography, some of the students have become especially interested in conservation, forestry, and geology. In the chemistry laboratory they learn how to combine elements into compounds and to separate compounds into elements. In the physics course they study and apply such laws as the laws of motion.

Thus youth learns to understand the close relationship between man and his environment—the fisherman and the sea,the miner and his ore, the farmer and his land.

30
60
90

A planetarium clears some ideas.

After studying the earth's yearly trip around the sun, these children direct their attention to the monthly trip of the moon around the earth. Eclipses, moonlight, daylight, and darkness become topics of discussion.

Watching the skies for phases of the moon led to the study of constellations and to an intense interest in the whole universe.

An excursion into the past

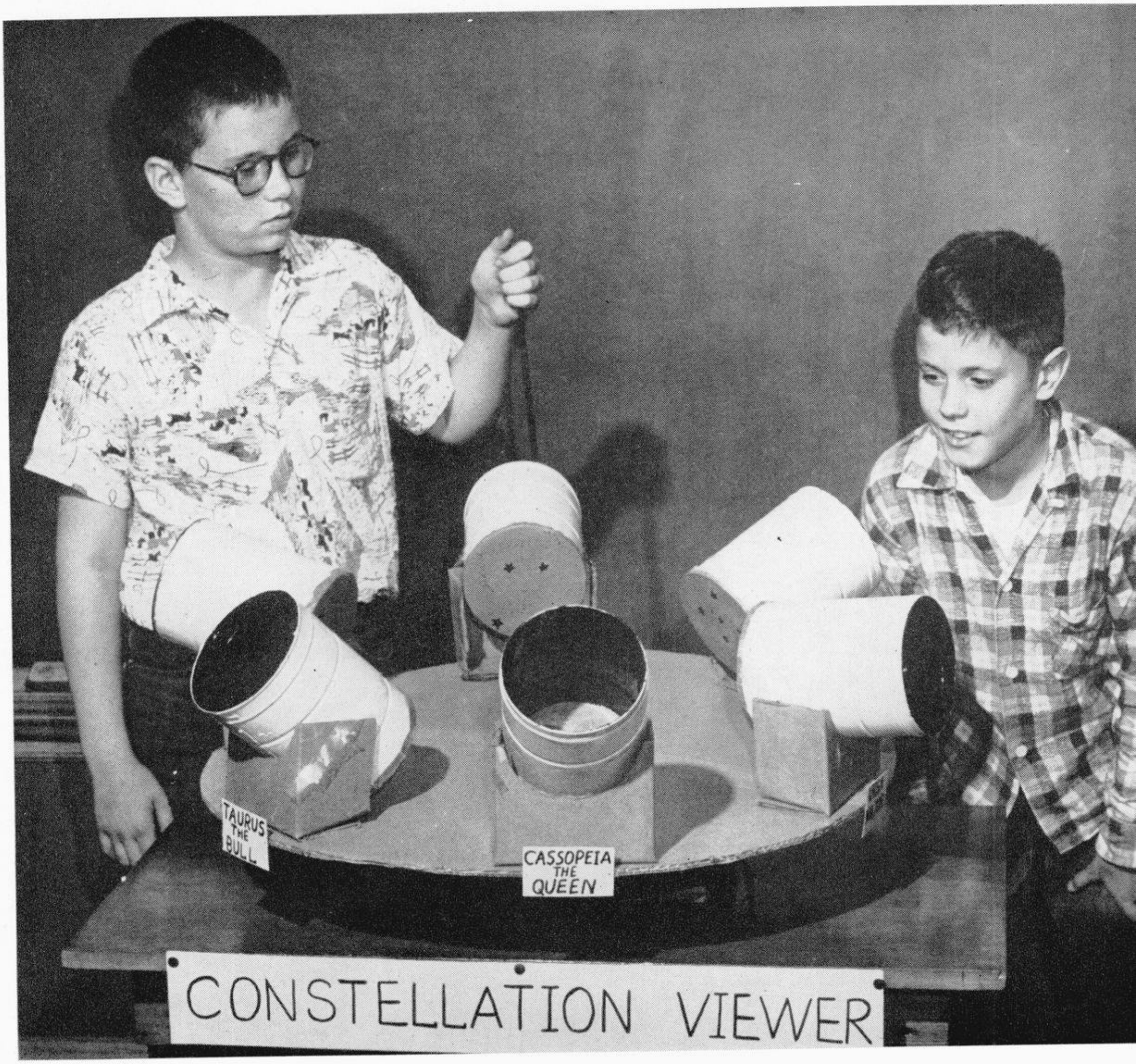
Research and reading carried these sixth grade children into the past and led them to construct models and diaramas depicting early animal life.

Adding realism to a study of the earth

Pupils make three-dimensional representations of water and land formations, such a sound, bay, strait, island, isthmus, cape, and peninsula. They helped teach other children what they had learned by means of talks based on their exhibits.

Searching for the stars —

To help in solving the problem "How can we learn to identify some of the constellations in the sky?" a constellation viewer was constructed by children in a fifth grade. Here, on a revolving frame, some of the commonly known groups such as Ursa Major and Minor were "seen" through a viewer made from cans. Children have a great curiosity concerning the exploration of the unknown beyond our planet. The study of bodies in space helps children distinguish between fact and fancy in science fiction.



A volcano which erupts!

The class across the hall was invited to see the eruption of a volcano. This model was made by a sixth grade group learning how physical forces change the earth's surface. A variety of working models were made in this study to help pupils understand the actual operation of these forces.

Tremors of the earth

Paul explains the intricacies of the seismograph, which records movements of the earth. He has samples of seismograms he secured from the University, including one with shock waves which depicted an actual earthquake.

Treasures in the earth

In the elementary school science fair, this boy explains the strata of the earth and possibilities of discovering an oil trap. The children constructed a miniature oil well.

It's larger than you would expect.

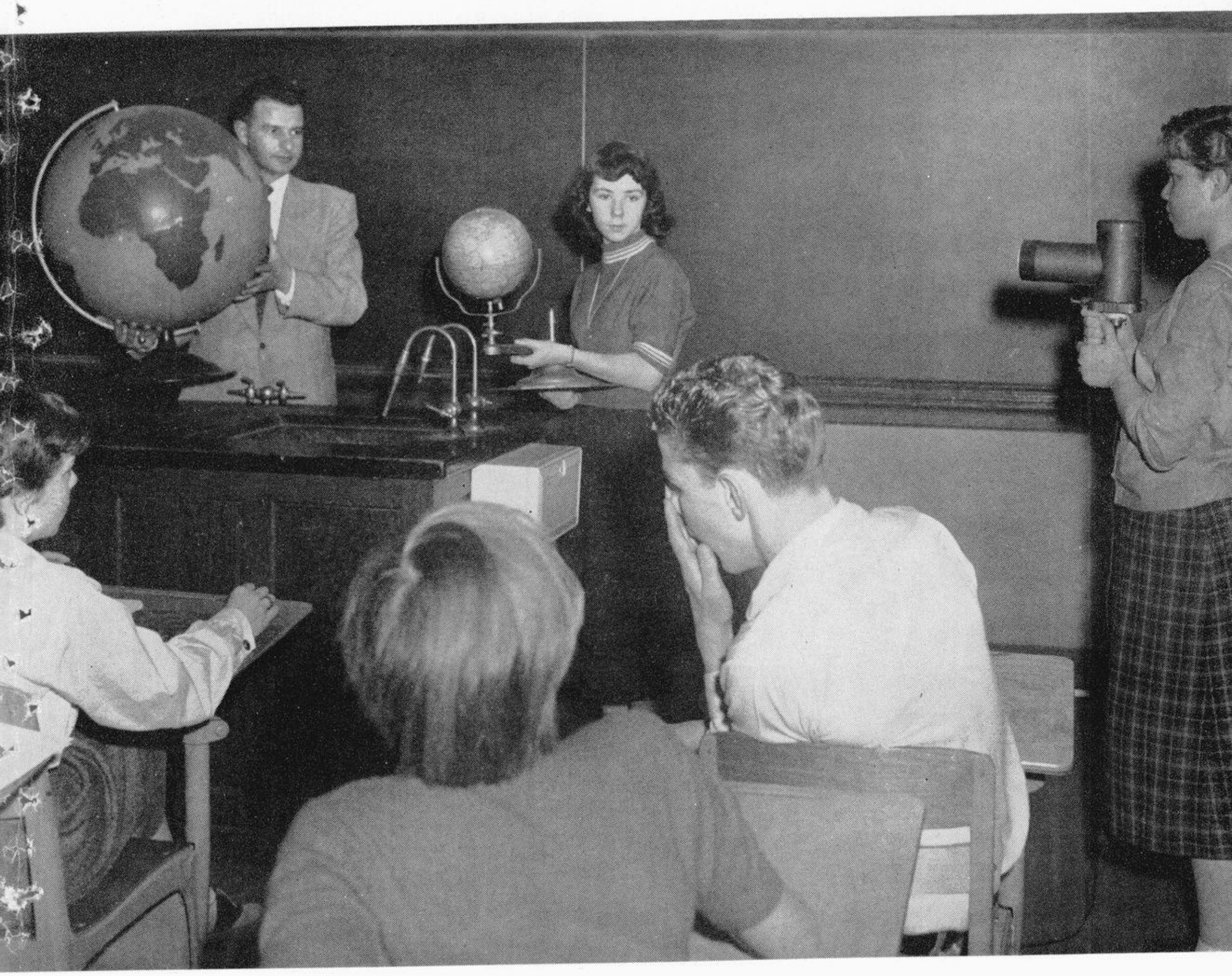
In making a model of our solar system, elementary school children find that the earth is a mere dot compared to the sun. Our earth becomes dwarfed by the larger objects in space.

A planetarium

A study of a planetarium gives pupils in junior high school a better understanding of the position of the earth in the pageant of stars, planets, and satellites. They begin to marvel at the orderliness of the universe and think of unsolved problems concerning the extent of space and the possibility of other solar systems like our own.

"By the Light of the Moon" —

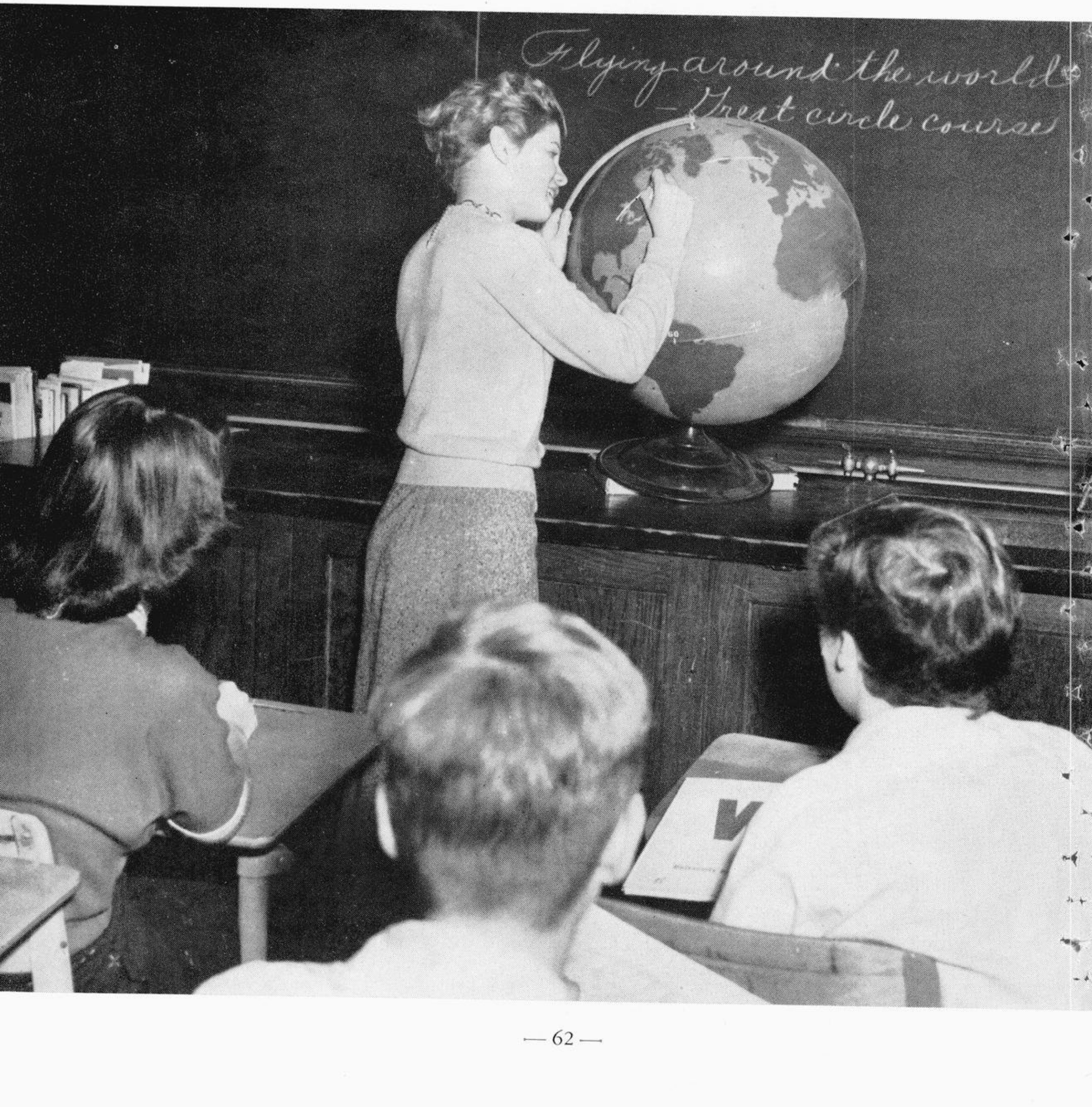
The light of the moon is really the light of the sun. Gail holds the sun (light source) while Barbara moves the moon into position to show that the moon reflects light from the sun.



THE EARTH AND HEAVENLY BODIES

We travel in circles.

Pat draws a great circle arc to show the shortest distance between Madison and Europe. Note that the course starting at Madison begins by traveling almost due north. Working with actual globes teaches pupils some of the limitations of flat maps. This might lead to the study of various map projections, such as the mercator, the polyconic, and the polar.



An unusual type of mining — the Frasch process

Sybil is using a pupil-constructed model of a sulfur well to explain how sulfur is now taken from the earth. This model illustrates man's ingenuity in devising a method of using super-heated water to melt the sulfur and compressed air to bring it to the surface through pipes. The cost of sulfur mined in this way is low compared to sulfur mined by other methods.

Sulfur is important in our way of life. It is basic in sulfuric acid, which is used extensively in manufacturing steel, paper, and other products.

Natural chisel

A three-dimensional map of land formations shows erosion of the headlands and from them deposition of material into the bay in the form of sand dunes. This illustrates the fact that water tends to cut off irregularities and levels the land.

"Wonderful Wisconsin"

Study of our own state includes the flow of the Wisconsin river from the lake region or glaciated highlands through the sand country, around the Baraboo range, and finally to the Mississippi. Because of its use for power, the Wisconsin river is known as "the hardest working river in America."

Fossils — records of the past

Without fossils man would have little knowledge of pre-historic times. From the fossil record we can see that plants and animals resemble those of the past. Knowledge of many extinct plants and animals are also brought to us through the study of fossils.

Water helps to change the face of the earth.

A plastic map of Mt. Rainier shows its glacier top, the eroded volcanic cone, and the rivers and tributaries which come largely from the glacier. Jim is pouring water on the map to show how the tributaries of the rivers flow to provide power for industry and water for irrigation.

Air, Water, Fire

Here are three great forces each of which out of control will cause great destruction. Just think of air in motion as a cyclone, tornado, or hurricane. Think of water in a flood, sweeping away plant and animal life as well as buildings, or the fertility of the soil, or cutting great canyons into level land. Consider a fire raging through a forest or a city, destroying the things valuable to man as well as man himself!

Yet, all three are indispensable in the orderly plans for living things on the earth, and are bound by rules to which there are no exceptions.

Small wonder that man is challenged to discover the relationships and the functioning of the elements. These elements are elusive, yet consistent. They appear in a great variety of mixtures, compounds, and forms. For example, carbon in coal is black and will feed a fire; in sugar it is white and sparkling and will feed a man. Again, oxygen in air is useful to fire, while in water it is an enemy of fire.

Air, a mass of gases with its dust particles and its water vapor, is responsible for the lighting of the earth by the sun. In motion, air brings about the pollination of plants that seeds may form. Air causes the movement of the clouds that rain may fall on areas of land where it is needed and air supports even the heavy aircraft of today overhead.

Water is a compound in which the invisible oxygen of the air becomes a tangible and visible material. Directly necessary to all living things, water is a real busy body.

Think of water traveling down through the soil, dissolving plant food, and bringing the food back to the roots of the plants. Or think of water gathering and storing gold and other metals in a particular depositing place, thereby challenging man to find them if he can. Water is responsible for the great deposits of limestone formed long ago at the bottom of the sea, and for the extensive coal deposits which were once masses of water-soaked living things. Water is used for sanitation and cleanliness, for carrying ships on the seas, for providing food, and for many other things.

Fire, as a friendly force, enables man to spend the winter months comfortably in the temperate zones of the earth. It makes his foods more digestible and palatable. Fire has also made possible the melting of ores and the mixing of metals to build today's machines. Hence, we have such things as modern transportation, modern appliances, and factory-made goods to make living more pleasant.

These are some of the facts and relationships that children arrive at through observation and study, until like Gary, in the picture, they turn to experiments of their own to test or to clarify their understandings.


$+ H_2SO_4$
Coppe
Silve

"Into the wide blue yonder"

In their study of solids, liquids, and gases, the children in third grade sent up helium-filled balloons, to which they attached self-addressed postcards asking finders to tell them where the balloons landed. One landed near the state line and another in Illinois.

How to put out a fire

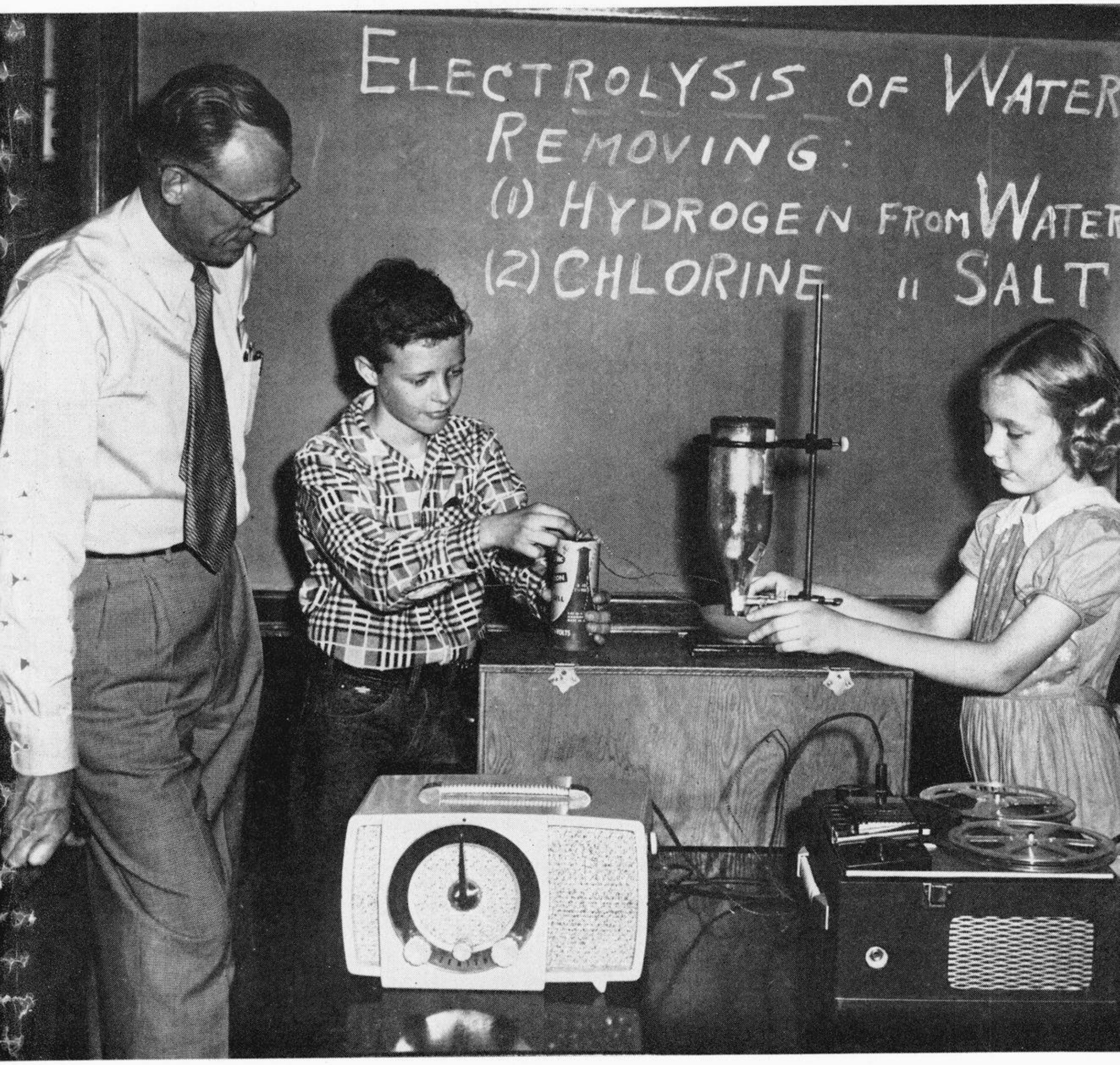
One sure way to put out a fire is to cut off the supply of oxygen. Bobby demonstrates that a candle will continue to burn in a glass jar only as long as there is any oxygen in it. His classmates now understand why one throws sand or earth over the remains of a picnic fire or a rug over an indoor fire to extinguish it.

Another way to extinguish fire

Patty pours carbon dioxide, which is heavier than air, on the lighted candles. This puts them out one by one because it keeps the oxygen away from the flame. She made the chemical by putting baking soda and vinegar into a jar.

"Let's find out" —

While listening to the Young Experimenters' program of WHA School of the Air, two children perform an experiment for the sixth grade. The program is tape recorded so that the experiment can be repeated by other groups.



Discovering how a pump works

Air pressure on the water in the pan pushes water up into the cylinder and a valve keeps it from returning to the pan. When Lynette raises the piston, gravity pulls the water down out of the spout into the beaker. As Lynette lowers the piston again, water rushes into the vacuum in the cylinder and the process is repeated.

How lungs work —

Suzanne pushes up on the "diaphragm" and deflates the "lungs". Then she pulls it down, and inflates them. She also explains that rib movements take place and contribute to the breathing process.

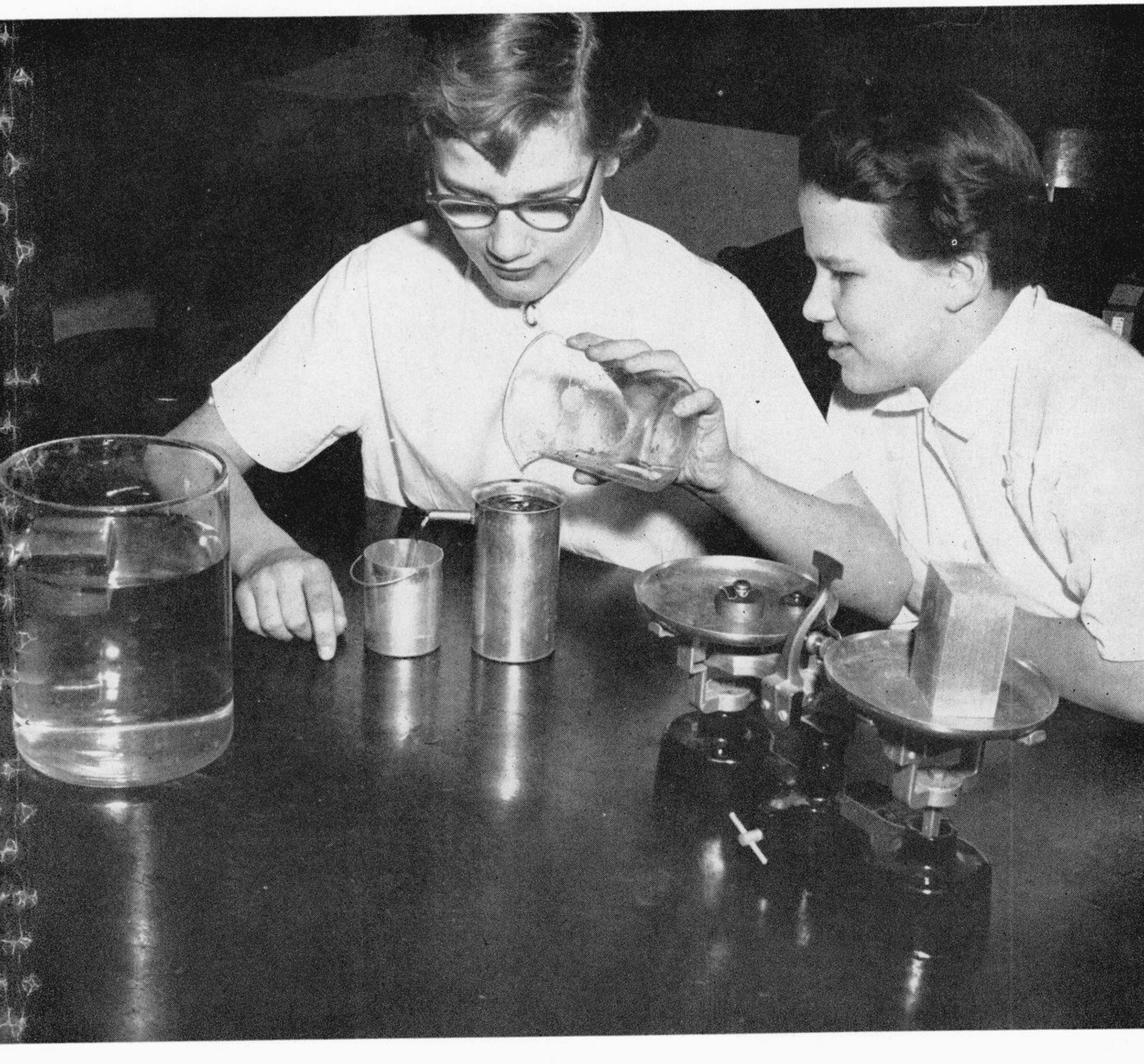
The calorie — a unit of heat measurement

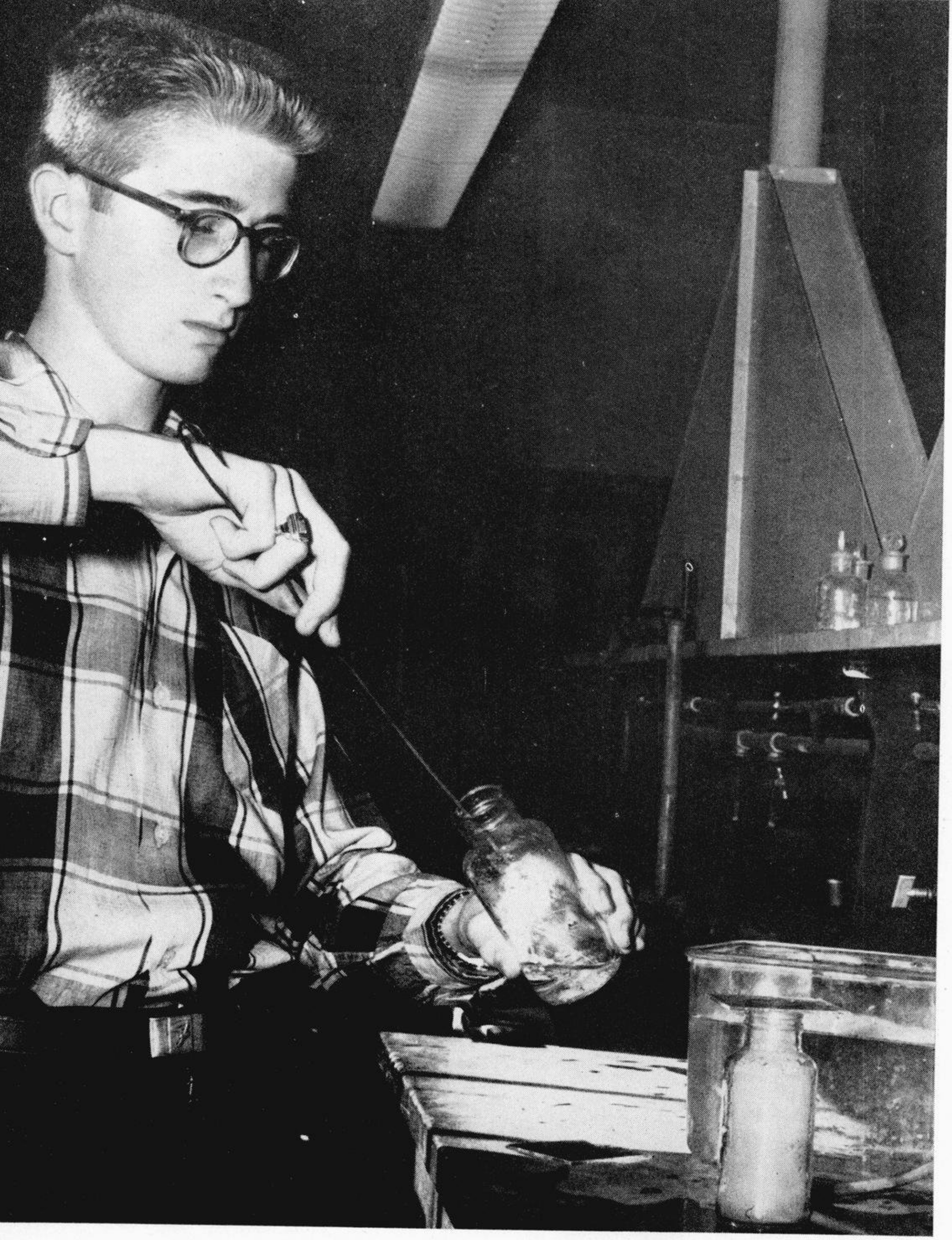
Through demonstrations pupils in junior high further their knowledge of the quantitative aspects of science. The calorie concept in diets becomes more realistic to Mary after she discovered how calories of heat can be measured by means of thermometers and balances.

Buoyancy depends upon liquid displacement.

Experiments with floating objects help pupils to understand the buoyancy and stability of boats.

Archimides' principle, which states that every object in water is held up by a force equal to the weight of the water displaced, furnishes a class with a good siutation for group problem-solving. Equipment is available and accurate enough to get excellent quantitative results.



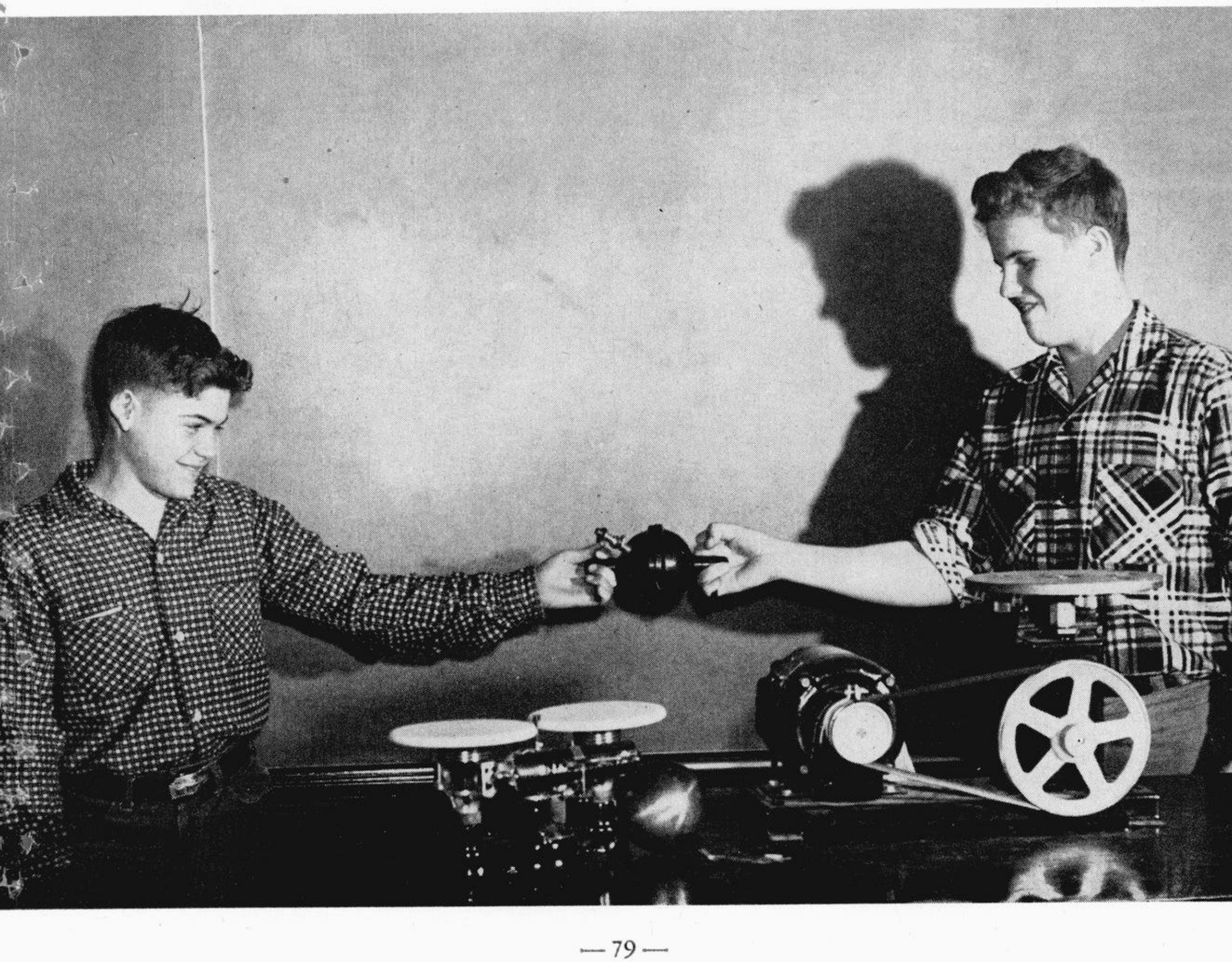


Oxygen is active.

Carl burns steel wool in pure oxygen, which action forms a new compound. He had generated oxygen in the bottle by breaking down compounds.

Air pressure exerts a tremendous force.

An often repeated experiment is that of attempting to separate two Magdeberg Hemispheres. Air pressure, to the extent of 14.7 pounds per square inch, prevents the two boys from separating the hemispheres within which is a vacuum. They learn that man uses air pressure as a force to work for him in such things as aircraft, automobile tires, and the vacuum cleaner.



Matter, Energy, Machines

A movable toy offers a child his first real experience with the world of machines. All that the child may like or appreciate is the fact that something now moves with a push or pull.

He is proud of his ability to use a machine correctly for the first time. He is thrilled when he discovers he can make a machine which will operate. A teacher, capitalizing on this natural experience, can guide the child at any level of learning to problems dealing with the nature of machines, laws governing machines, and the relation of machines to society. In the elementary school the pupil is curious about the ease with which a machine can do work and about the various kinds of simple machines. Later in his school career, he finds certain laws and mathematical relationships between the working parts of machines. Still later, he is able to master the arrangement of simple machines into more complex machines, such as automobiles, derricks, tractors, and shop machinery.

For all of us to use machines most effectively, simple and complex, we must understand them. The child learns that an inclined plane, as a simple tool, is similar to the hill. He discovers that the inclined plane has associated with it such characteristics as grade, efficiency, and mechanical advantage. He begins to see reason in the engineering of highways, simple tools, the design of the stairway up which he walks to his classes, and the toboggan slide upon which he enjoys riding in the winter. He begins to realize that involved in the use of the simple machine is energy, work, and power.

As the pupil's knowledge is extended, he is able to comprehend the facts concerning the many sources of energy and their relationship to the progress of civilization. He begins to recognize the role which scientific thinking and achievement has played and will continue to play in his own life and society. New ideas concerning energy help us to consider factors related to atomic energy and greater use of direct solar energy. Young minds of today will determine the extent to which these will be used.

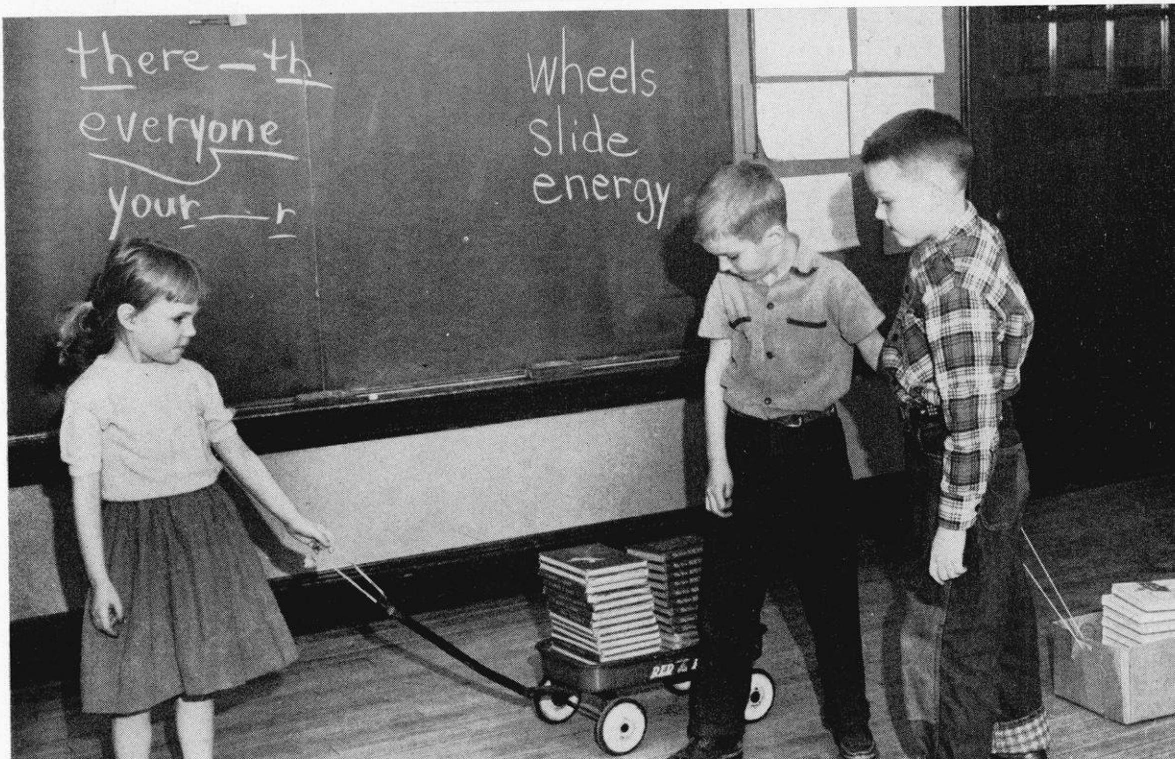
What will tomorrow present to our people in terms of new machines and new uses of power? To what extent will automation be used in our industries? How will it affect our productivity and what effect will it have on our society? The answers will come from the student in the classroom today who discovers and studies fundamental ideas about machines. Later, these ideas will provide the foundation for creative thinking and invention upon which progress depends.

The thrill of a lifetime

Linette and Jimmy met the engineer and fireman the day the kindergarten children took a train ride—the first for many of them.

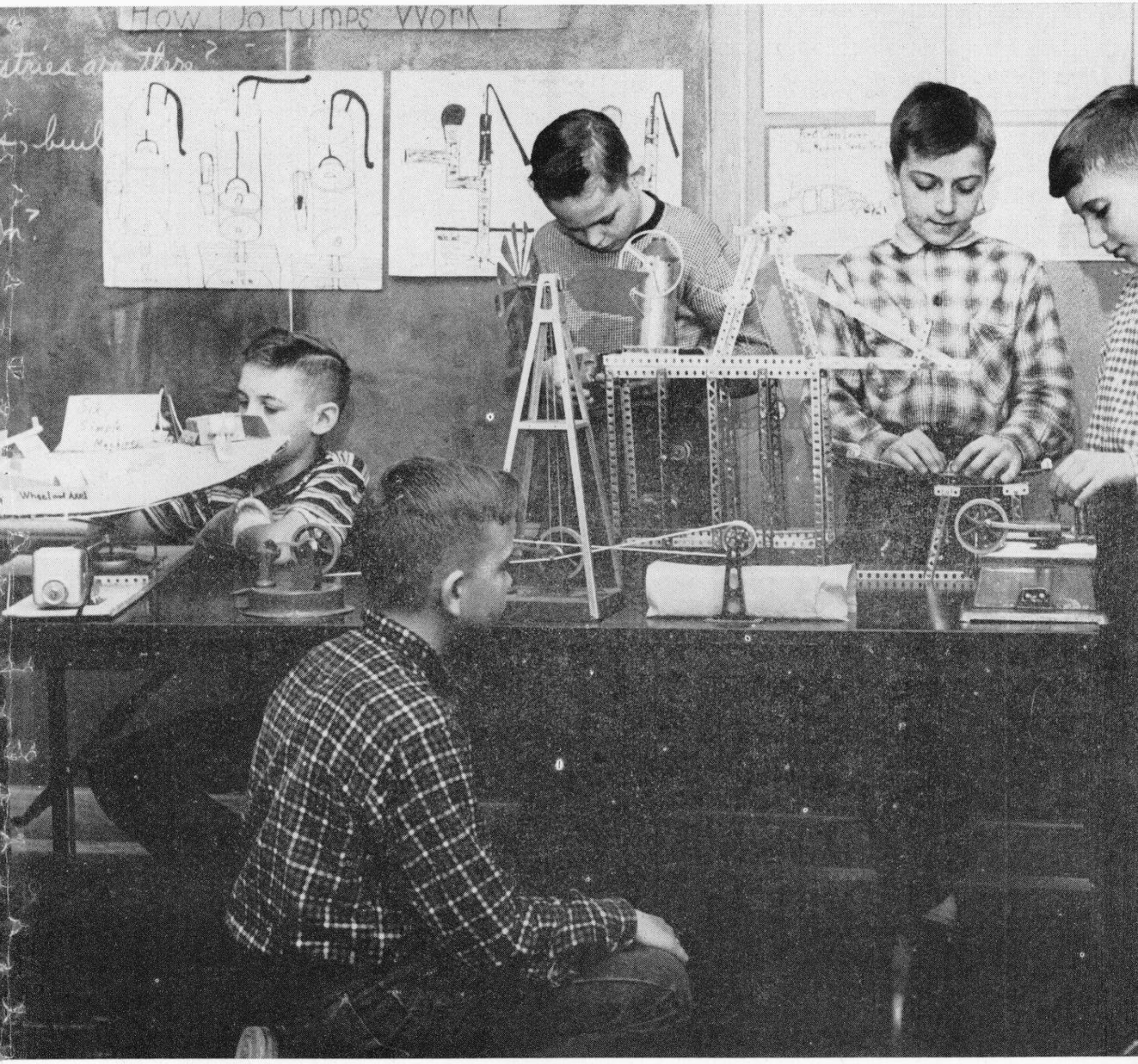
Wheels reduce effort.

Children learn about simple machines through manipulation of their toys. They observe that rolling friction is less than sliding friction. Later they learn to recognize simple machines in more complex machines.



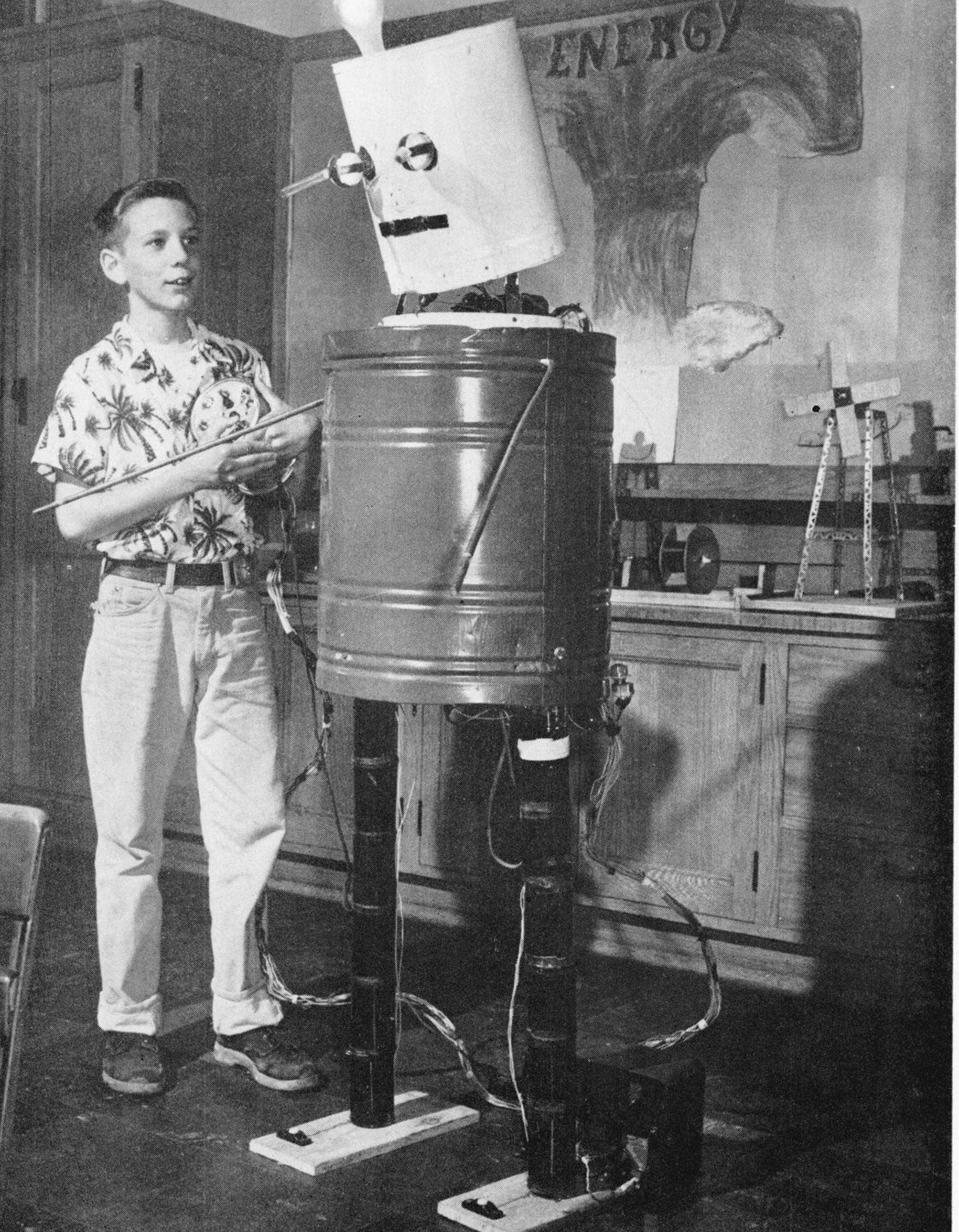
"Make it go faster."

At the science fair, Joe uses a toy steam engine to explain the principles of steam power.



Building machines

These boys apply what they have learned about simple machines in setting up more complex machines for their class.

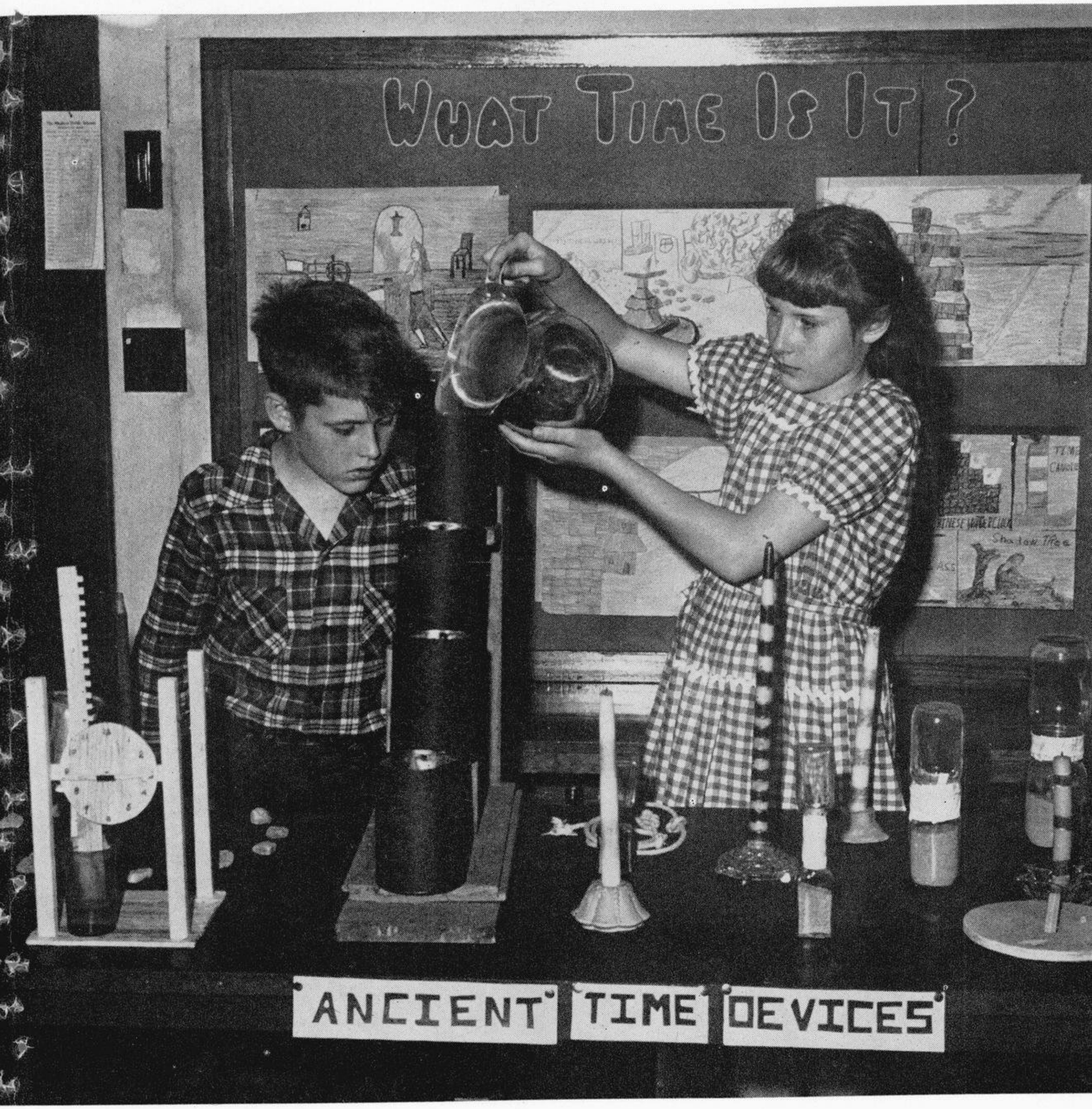


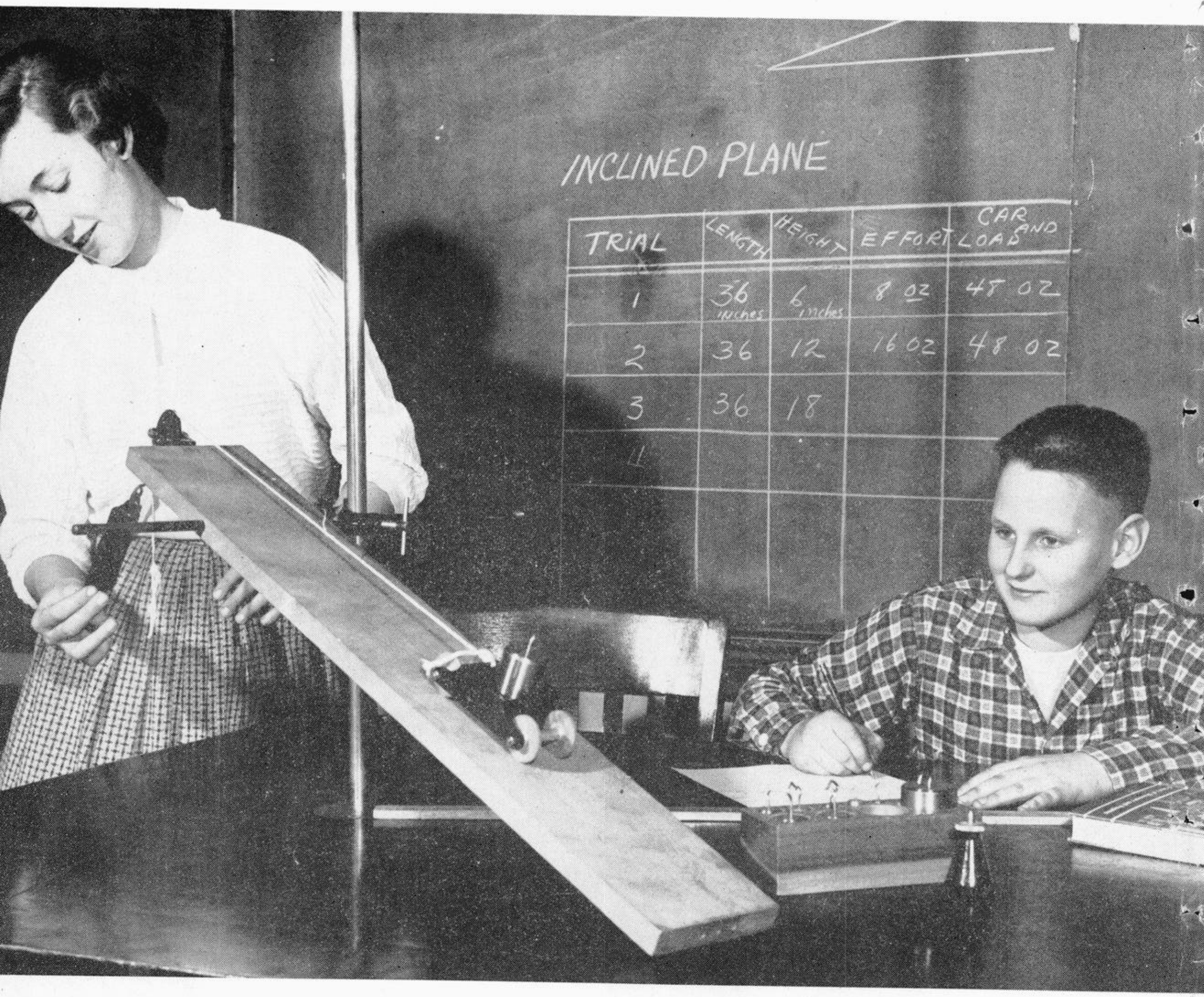
It nods, it blinks
It moves, but it does not think.

But Dave did think when he created this robot. His interest in energy in the sixth grade stimulated him to conceive the robot. He started it in the summer and finished it in seventh grade. It was exhibited recently at a national meeting of science teachers at the University of Wisconsin.

The Greeks had a name for it.

To enable their classmates to visualize ancient time devices, sixth grade pupils constructed and demonstrated a number of them. Geraldine and Jim demonstrated a Greek water clock, called a clepsydra.





Machines help in doing work.

Junior high school students study the inclined plane as a simple machine. Judy and Allen measure the effort required to pull the loaded car up the incline. They will attempt to discover the relationship between steepness and the effort required to perform the task.

Future drivers learn about motors.

In a study of machines, Norman and Harold compare the working parts of a modern automobile motor with those of a small scale model. Boys have a great interest in science when it is applied to their hobbies and outside interests.

Molecular structure — a symbol of the atomic age

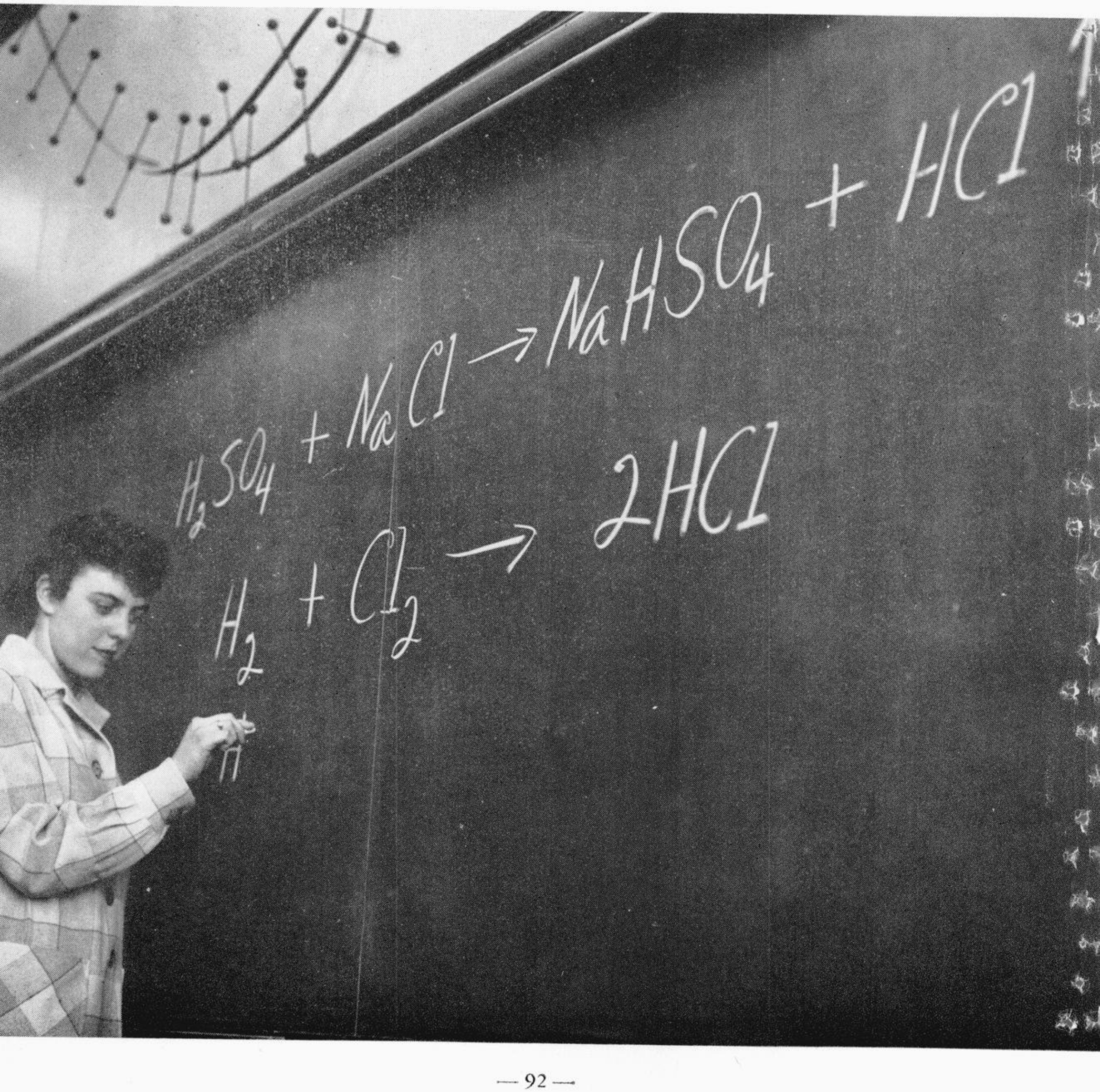
Mary finds that building molecular models of organic chemicals aids her in understanding how they combine with other chemicals. A study of organic chemistry is useful in helping to understand the new drugs, plastics, and other synthetic products being placed on the market today.

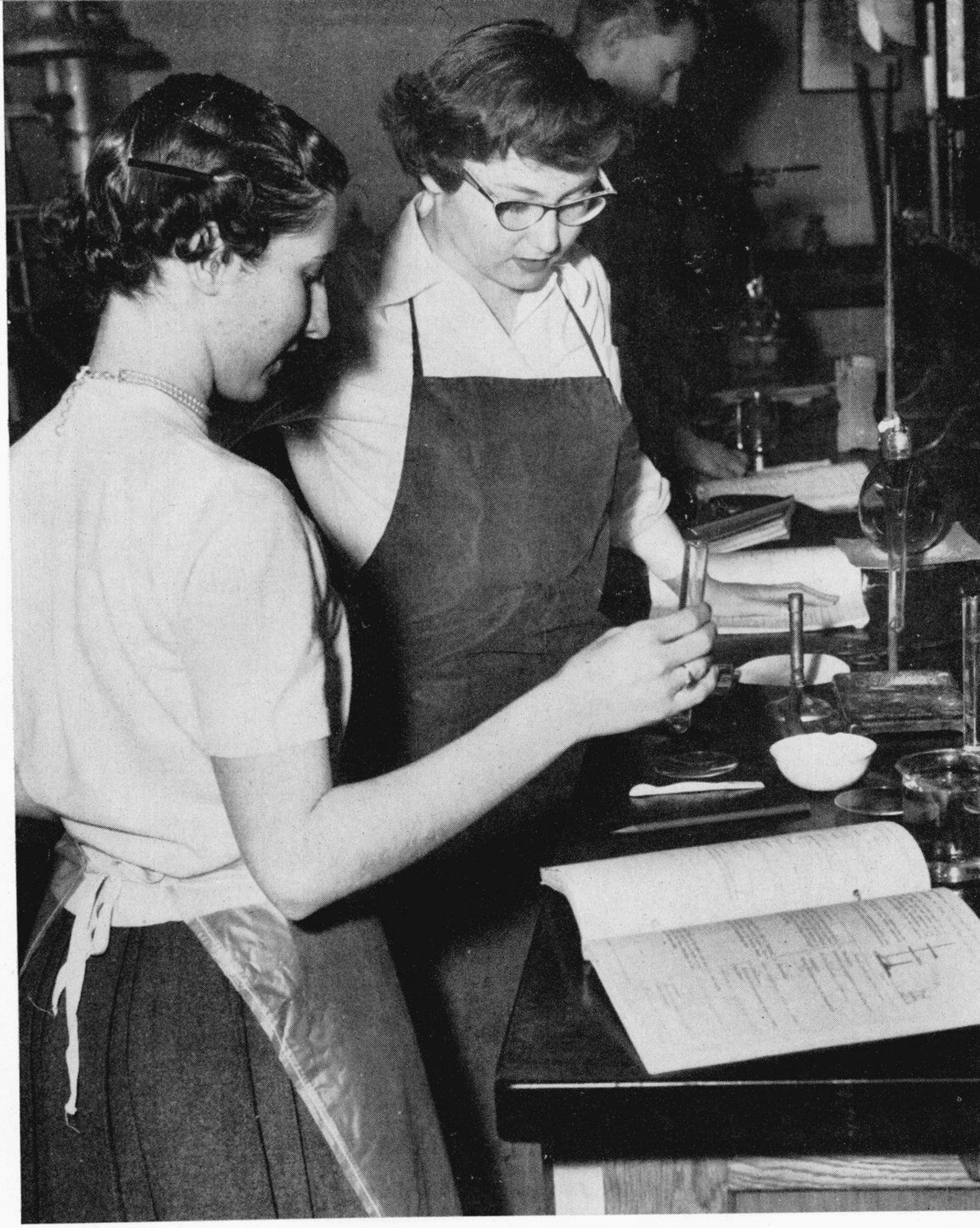
No "tattletale grey" here.

The bleaching action of sulfur dioxide on flowers and fabrics is studied in the chemistry laboratory, as chemistry is applied to practical problems. Color chemistry is closely related to such bleaching agents as chlorine water, sulfur dioxide, oxygen, and ammonia in air.

The language of chemistry

Bonnie is writing chemical equations which show the changes that take place when chemical substances interact with each other. The equations show the exact quantities as well as the particular elements involved in these changes.





The creation of a chemical compound

In the preparation of nitric acid the girls collected the acid from the retort. In various ways they will test the acid to become familiar with its properties. Nitric acid is important in the manufacture of explosives, fertilizer, plastics, and many other important products.

To a thousandth of a gram

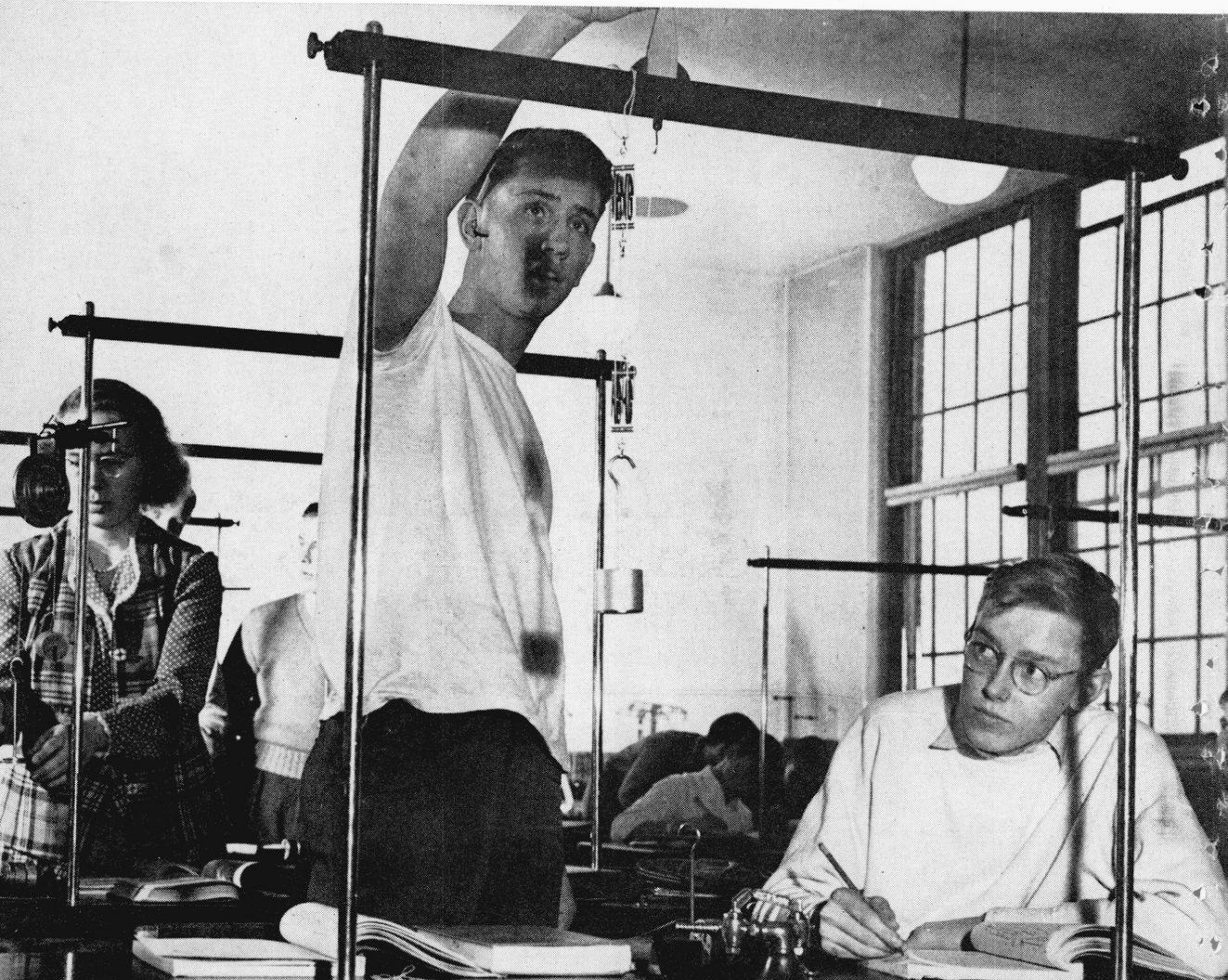
In weighing a crystalline compound on the analytic balance, Jane uses forceps to add small weights. Through such meticulous work, pupils learn the importance of obtaining exact measurements.

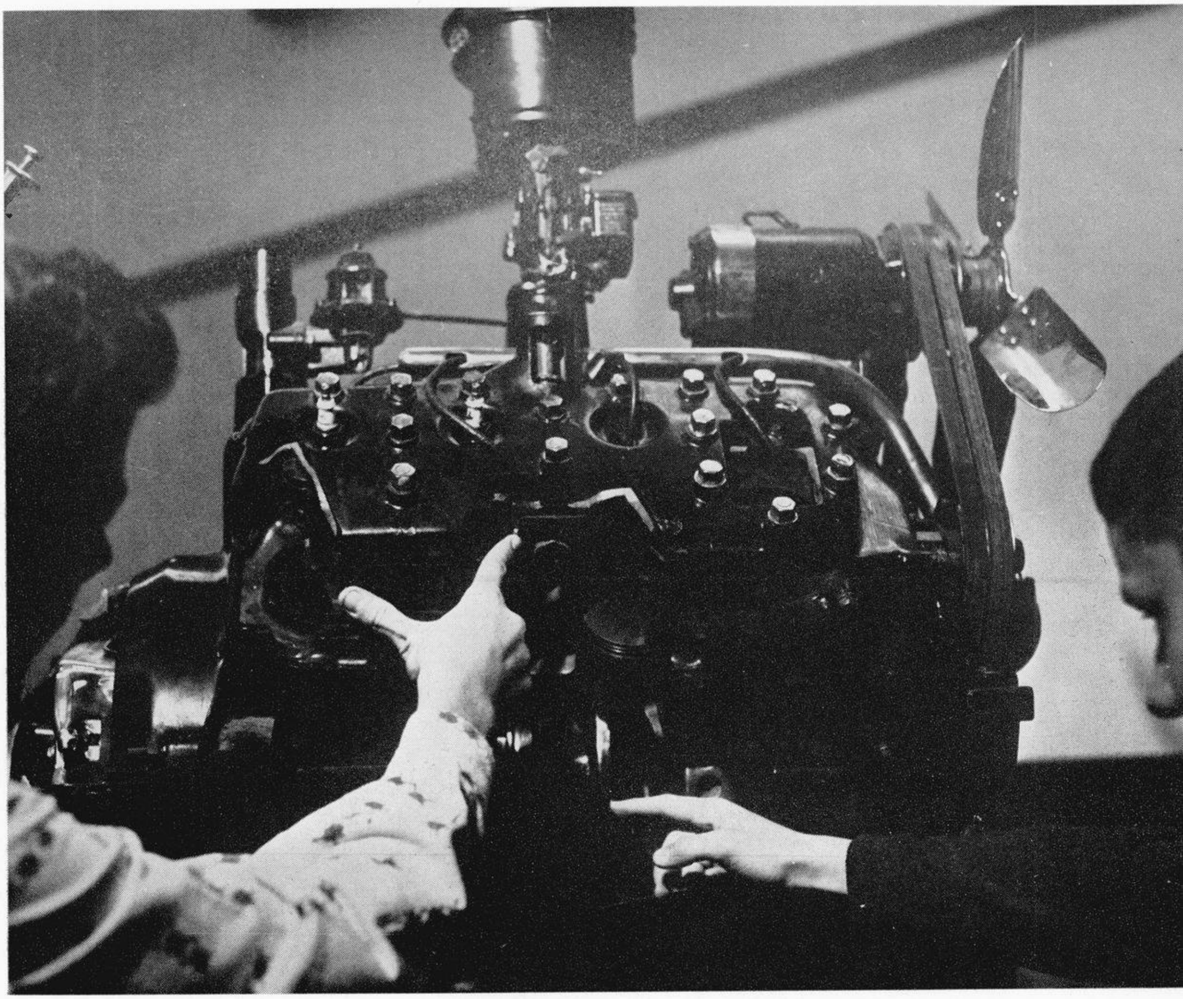
The Babcock milk test

Rural students have the opportunity to study problems directly related to agriculture. Laboratory, classroom, and field projects are correlated in this course.

How simple machines work

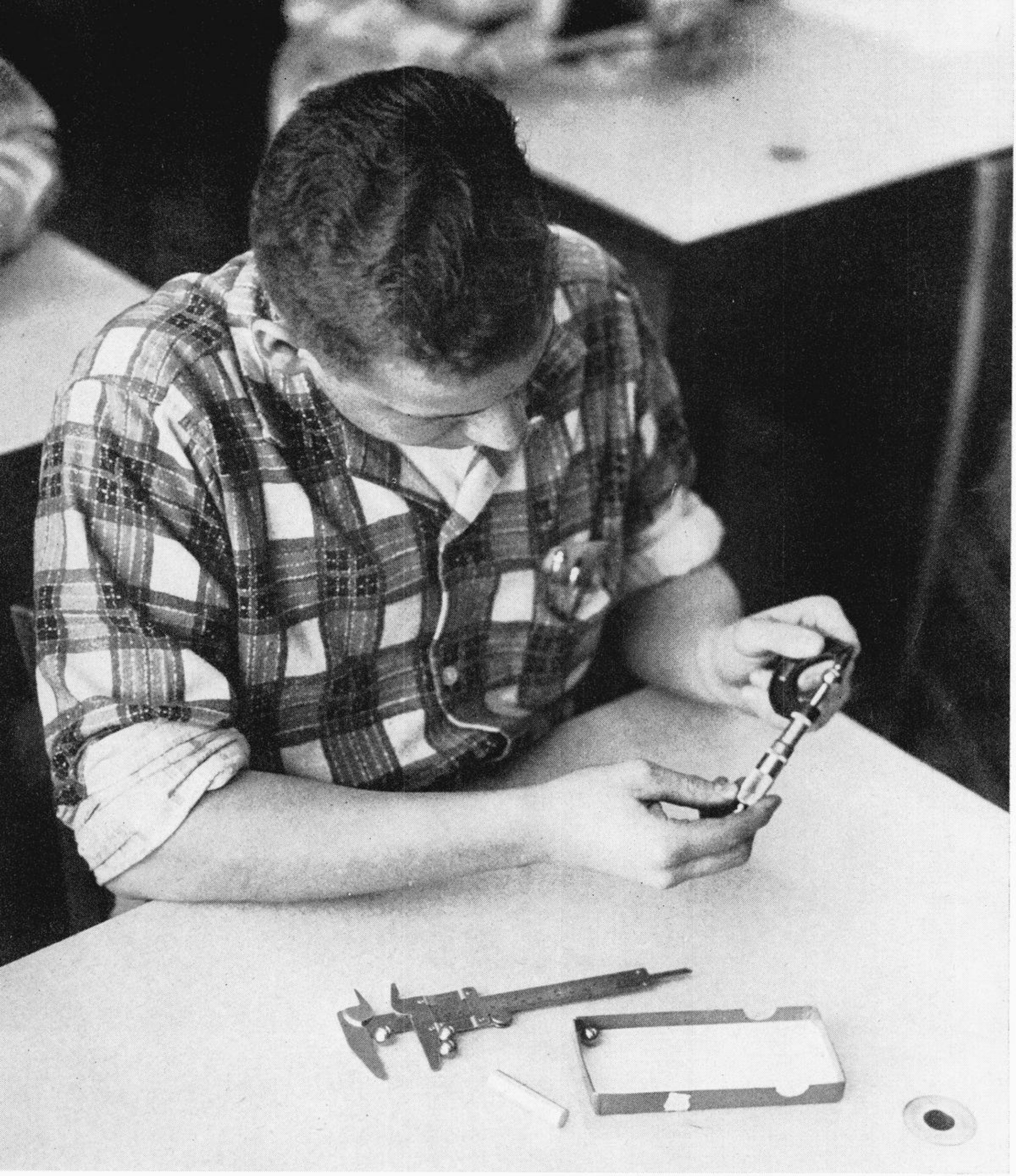
After a study of simple machines such as wheel-and-axle and pulleys, students find it easier to understand the workings of steering wheels, handles on doors, fountain pens, and complicated machines.





A mechanic's-eye-view of an engine

The boys examine a car engine, which has been cut away to show the interior parts. This is part of the study of heat—specifically heat engines.



This is a precision measurement.

Learning to make accurate measurements is an important phase of the study of physics. With a micrometer caliper John measures the diameter of a steel ball bearing to within .001 inch. He uses the metric system which is universal in all scientific work. The instrument on the table is a vernier caliper used for the same purpose.

An experiment in solar energy

Using concave mirrors to focus the heat rays of the sun, students learn that the rays will ignite paper. Much research is being done in this field today with a view toward utilizing more of the sun's energy.

Magnetism and Electricity

Like other forms of energy, electricity is a mysterious force. Though no one knows exactly *what* it is, much is known about *how* it acts. The mysterious force we call magnetism is similar to electricity in many ways, and there are many phenomena in which these two forces act interdependently. Therefore, the two are studied together with emphasis on how they behave and how they can do useful work.

In the lower grades magnets instantly catch the absorbing interest of the children. How magnets attract certain objects, attract or repel each other, and move with invisible force are sources of wonder that lead to many searching questions. Simple electrical experiments, such as connecting batteries, bells, and light bulbs, give children pride of accomplishment and extend their knowledge about electricity.

As they progress in scientific learning up through the grades, experiments become more complicated. Gradually the many facts are organized into general principles. Practical applications to everyday living are many, and the satisfaction of understanding motors, batteries, switches, and many electrical appliances serves to maintain interest.

Quantitative ideas are introduced in junior high school and developed in physics in senior high school. Pupils find that it is not enough to know *where* the electric current flows. They must also learn to calculate *how much* current is flowing and what factors control the amount of flow. Experiments and apparatus become more delicate and intricate, and students develop the skills needed to operate them. Along with calculation, they also study some of the elementary theories about magnetism and electricity.

Pupils gradually develop an appreciation of the part electricity plays in modern society and of the scientific methods that are responsible for its utilization. They find that there are many ways in which a knowledge of electricity can be useful in a highly technical age. Some students will even choose this field for their life work.

The wonders of a magnet

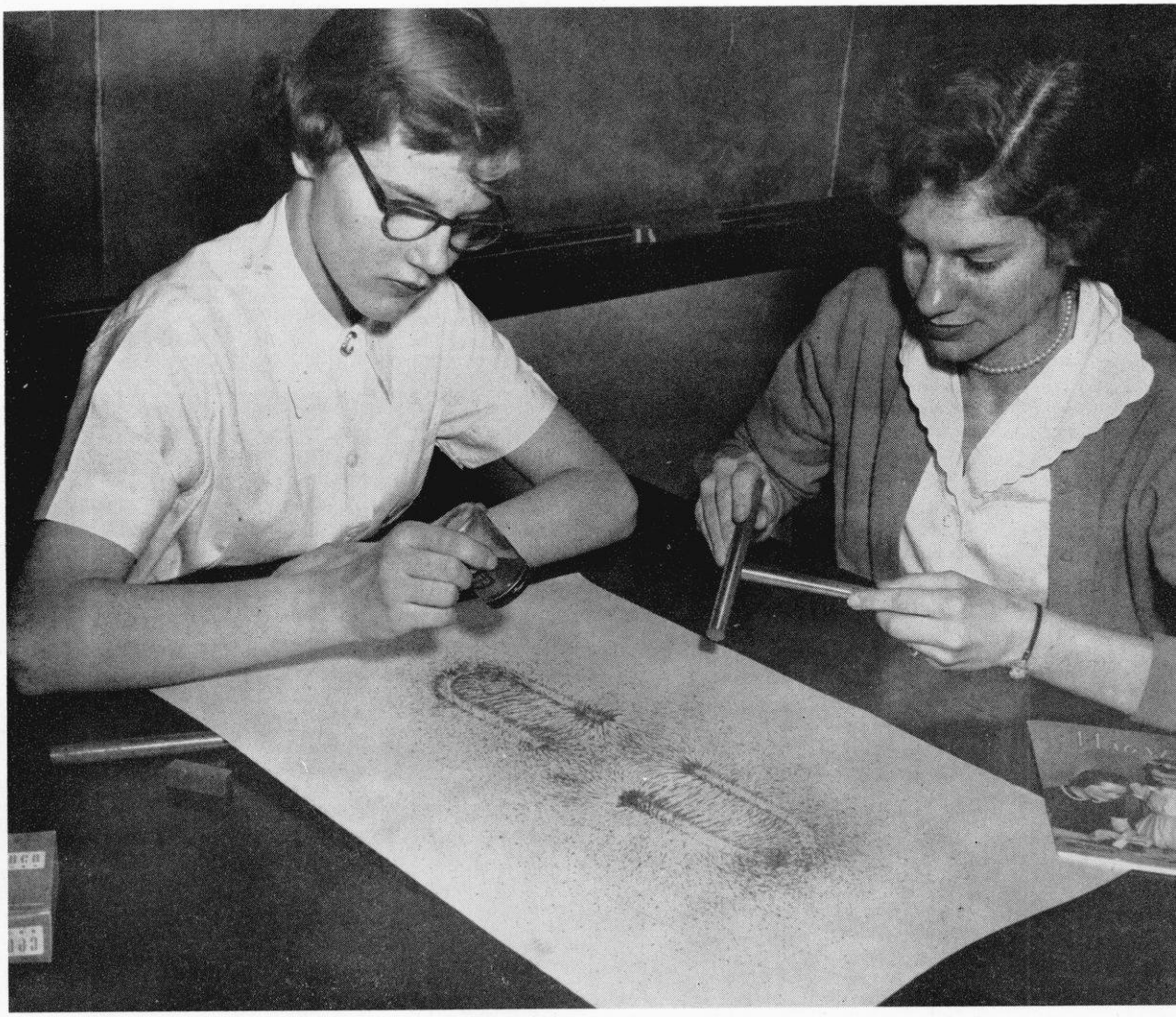
A magnet will not pick up shells, pieces of cloth or paper, or a spool of thread. But it will pick up metal objects, as these primary children discovered when they "accidentally" spilled a box of thumb tacks and paper clips.

Transforming energy into electricity

Children demonstrate uses of the electromagnet in the telegraph, telephone, and motor which they made. The crystal set radio, assembled by a sixth grade boy, developed interest in the complex short-wave radio.

"Let me do it this time!"

Pupils observe that the light goes on or the bell rings when they make the proper connections of the insulated wires and batteries. Ronald demonstrates that more than one light or bell in a circuit may make it necessary to use several batteries in a series.

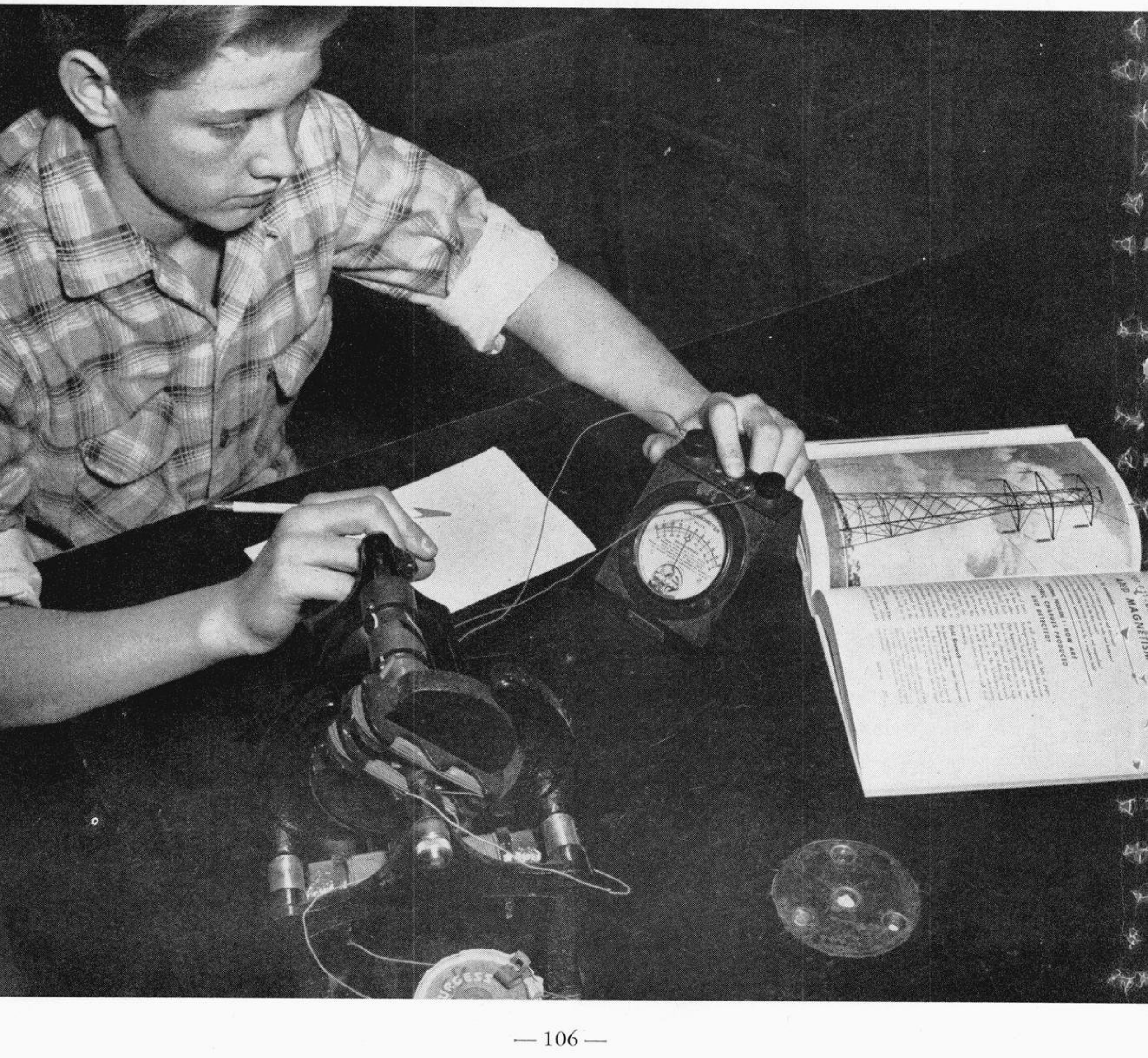


Magnets attract

At first magnets fascinate children because they seem to possess strange invisible forces. Later on pupils discover that these forces can be charted and measured. Electrical motors, relays, and circuit breakers are all examples of applied electrical and magnetic forces.

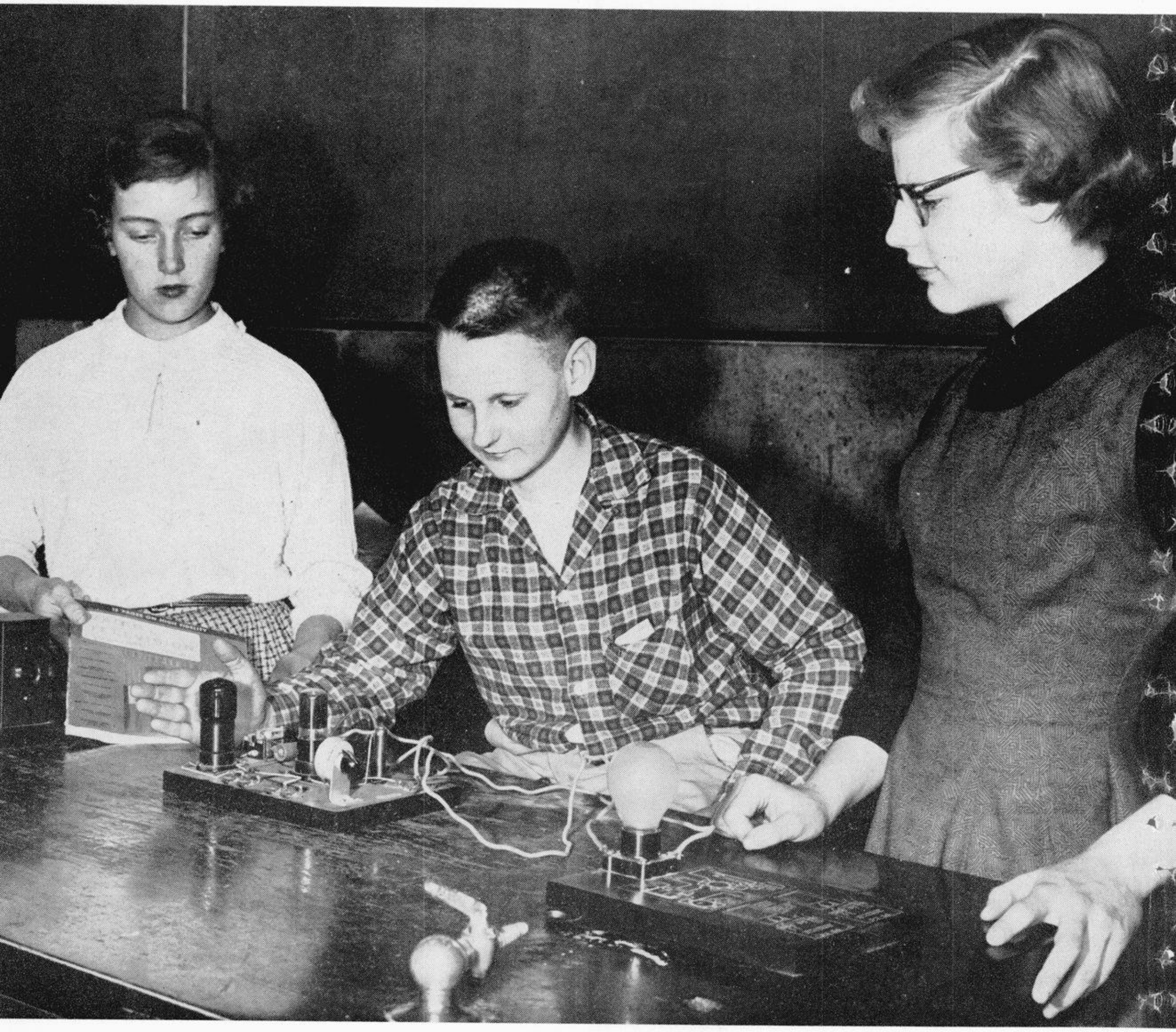
A shocking experience

It is one thing to use electricity and quite another to understand it. Bill turns the handle of a demonstration generator and observes the effect on a galvanometer. What is alternating current? What is direct current? What is a 60-cycle current or voltage? These and other questions will be answered as Bill studies a unit on electricity.



The ABCs of telegraphy

Allan is interested in the telegraph set-up of batteries, circuits, and key. Knowledge of simple means of communication helps children to understand radio and TV.

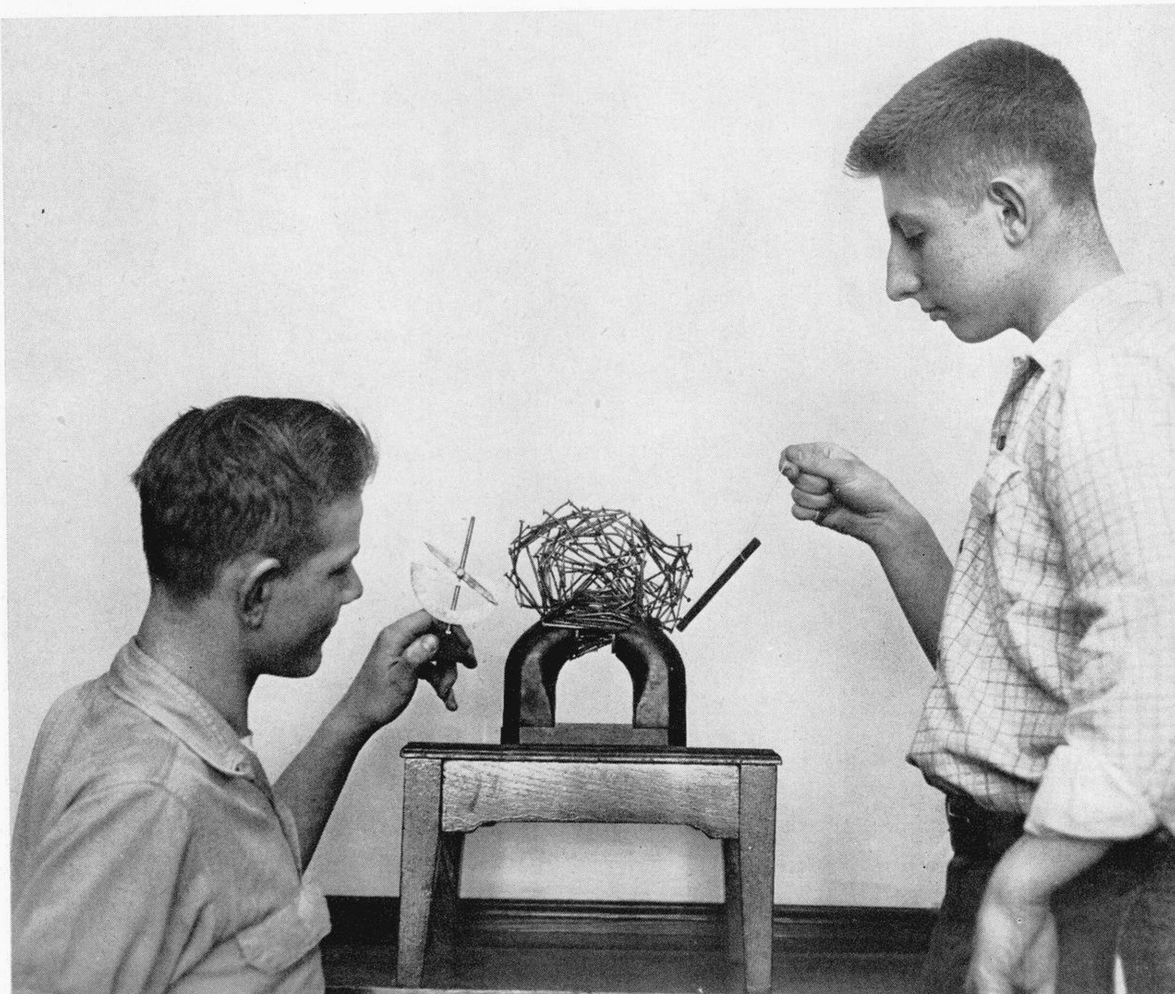


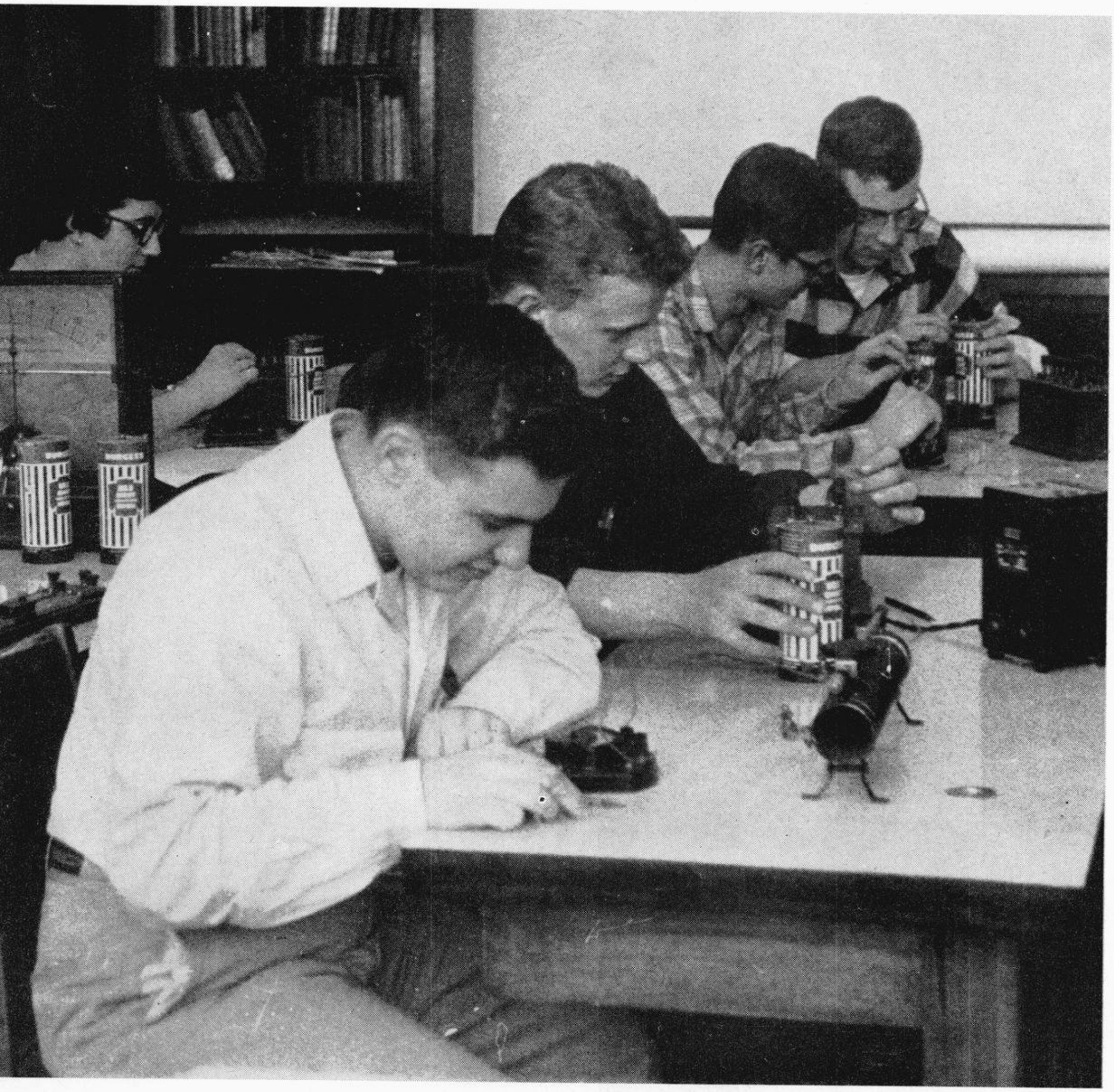
"The eye that never sleeps"

The electric eye can perform many tasks such as opening doors, ringing bells, and counting cars on the highway. The little photo tube near Tom's right hand is responsible for our sound movies, TV, wire-photo service in our newspapers, and for operating burglar alarms.

Surveying the magnetic field

These boys investigate the shape of the magnetic field. One boy uses a compass or dipping needle, while the other boy dangles a magnet on a string to indicate the invisible lines of force in the region of the two poles.



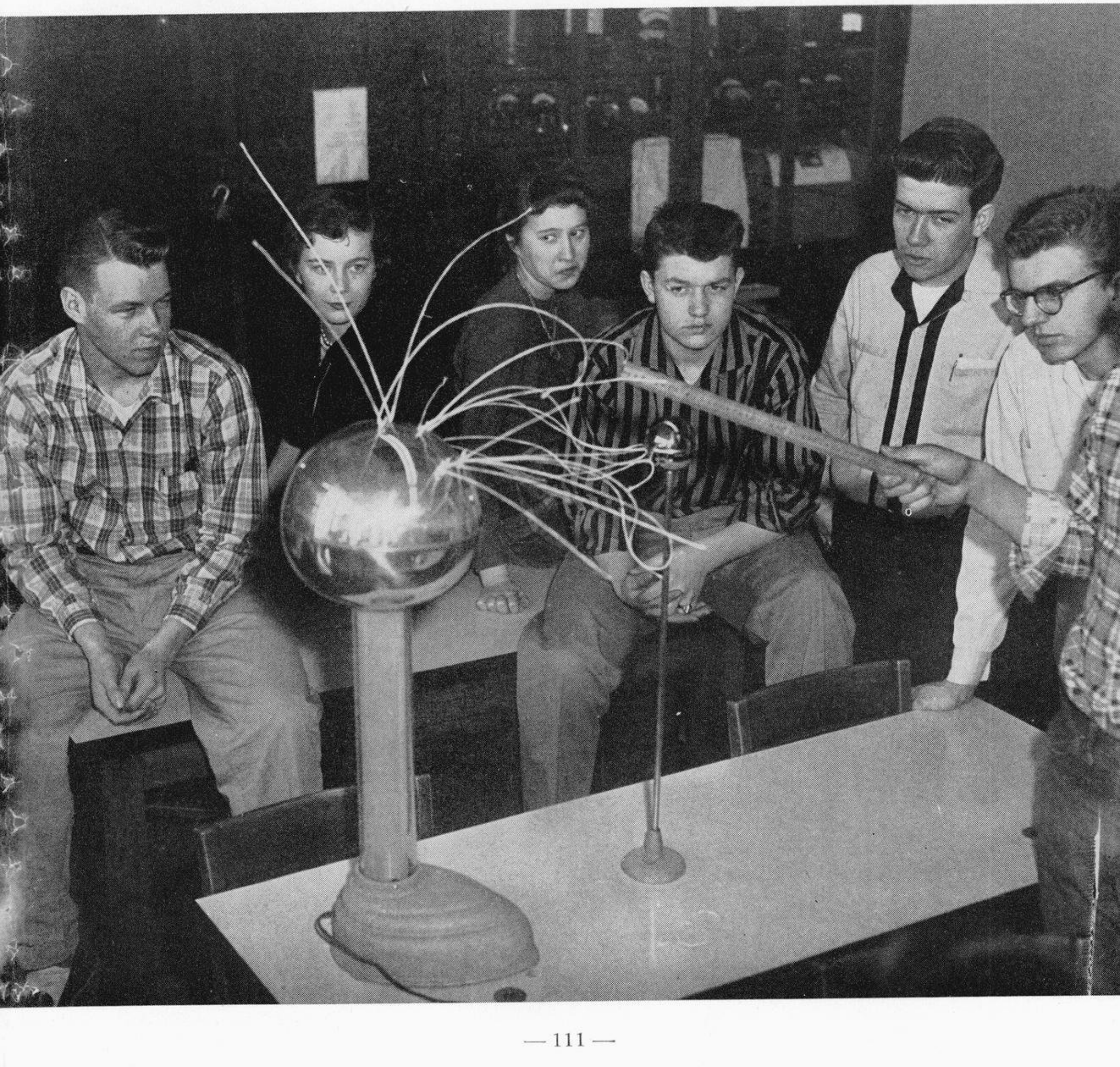


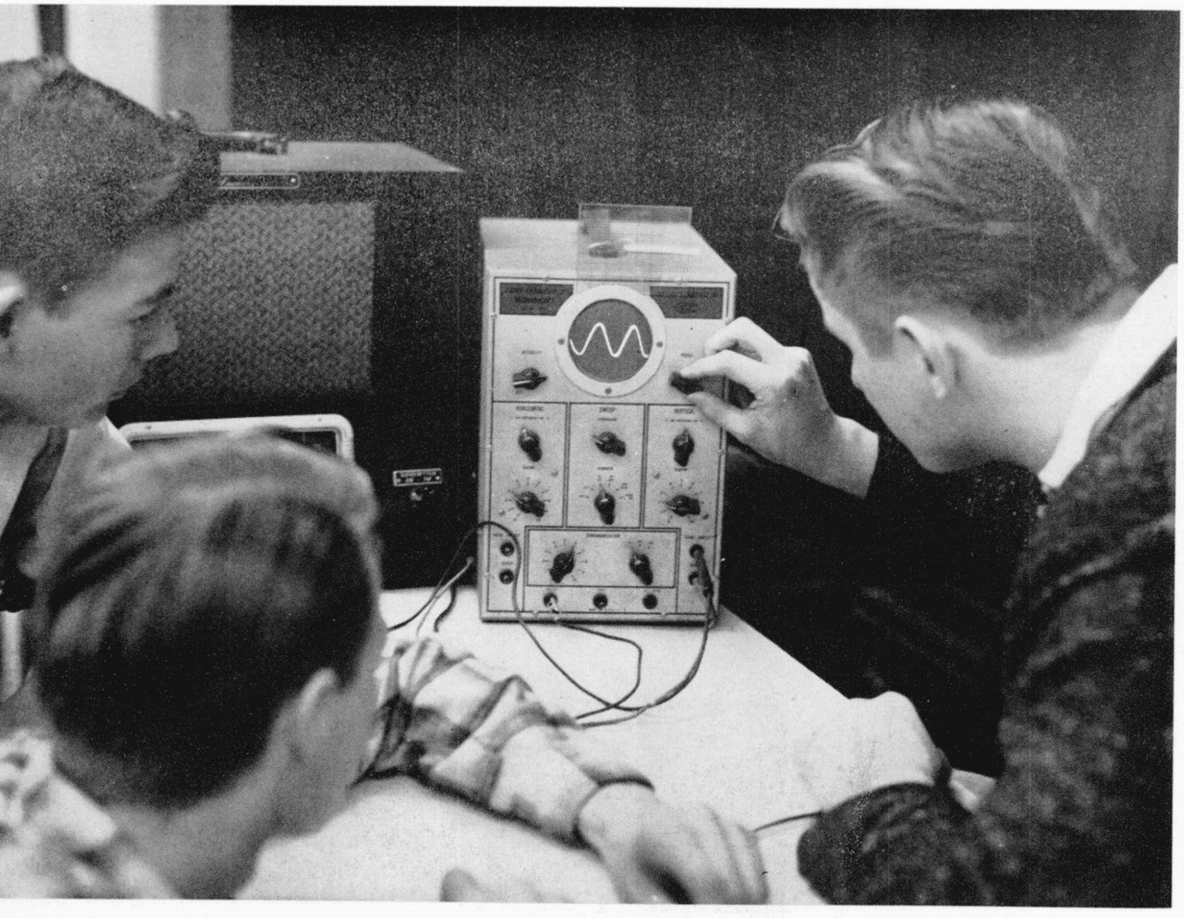
There are laws in science.

High school youths learn Ohm's law which states that current equals voltage over resistance. They connect cells and resistors in simple electric circuits and discover what factors control the flow of the electric current. They also learn how to connect and read electrical measuring instruments—voltmeters and ammeters.

A half million volts

These flashes, coming from the terminal of the electrostatic generator, stand on end like freshly combed hair in dry weather, and arrange themselves along the lines of force in the high-voltage field. From this observation pupils learn the characteristics of electrostatic fields which are fundamental to the operation of condensers and vacuum tubes. It helps them to understand electrical storms.





Sounds can be seen.

Sound is made visible through electronics. The oscilloscope, which is connected to the radio, makes visible a moving graph of the sound waves heard from the radio. The tube in the instrument is the same type as the television picture-tube.

"Come in, W9HIH" —

Members of high school radio clubs frequently exchange messages, often build their own transmitters and receivers, and sometimes take the test to become licensed operators. Many of the 200 or more radio "hams" in the Madison area learned their skill in the high school clubs. This avocation has great vocational possibilities.

Sound

From the beginning of civilization, man has depended upon sound to convey his thoughts and knowledge. For centuries he used sound without understanding either its nature or the ways in which it could be used to better advantage for his amusement or his work. But the constant efforts of scientists to seek the truth have now led him to understand the sources of sound, the way it travels, the speed of sound, and even some of the mysteries of the human ear. So man strives onward to utilize scientific truths in the betterment of his living.

Today's bands and orchestras display evidence of man's desire to create musical scales, instruments, and compositions from which he can derive pleasure to suit his tastes.

He has created devices which in many divergent ways express his desires to extend the horizon of knowledge in the area of sound. The first atomic submarine, the Nautilus, goes forth to the seas equipped with the most modern sound equipment, capable of giving her crew constant warning of the ocean depths and approaching naval vessels. Aircraft speeds are expressed in terms of the speed of sound, and new terms like "sonic barriers" are coined to meet a new era of speed. Edison's early principles of sound recording on a phonograph have been developed into new high-fidelity sound recording, so accurate in reproduction that the sound seems to be close at hand. Engineers' concern for the acoustics of an auditorium or a theater has led to a consciousness of the sound qualities of classrooms and homes.

It is not surprising that with a greater understanding of the fundamentals of sound there should be created a greater number jobs in the field of sound engineering and technical assistance. The following are only a few examples: operators for naval underwater sound equipment called Sonar; sound engineers for broadcasting networks; specialists in the field of hearing aids; acoustical engineers to aid in the design of modern buildings; and other engineers to explore the field of ultrasonics.

Pupils in the schools today are getting background for these new jobs as they look for answers to such questions as: What makes sound loud and soft? Where are sounds produced? What carries sound? How fast does sound travel? How are pleasing sounds created in a musical instrument? Why do sounds affect people differently?

Proving that a drum vibrates

Drums make very loud sounds. The boys experiment to see if there are vibrations. Mark beats the drum as Michael pours the sand. They notice that the harder the pounding, the higher the particles bounce, and then of course, the sounds become louder.

Vibrations make the sounds.

Reading and studying pictures about sound are very rewarding in second grade. So are experiments. The children watch and listen as Janet plucks the rubber band. They notice that sound can be heard only while vibrations can be seen.

Vibrations splash water.

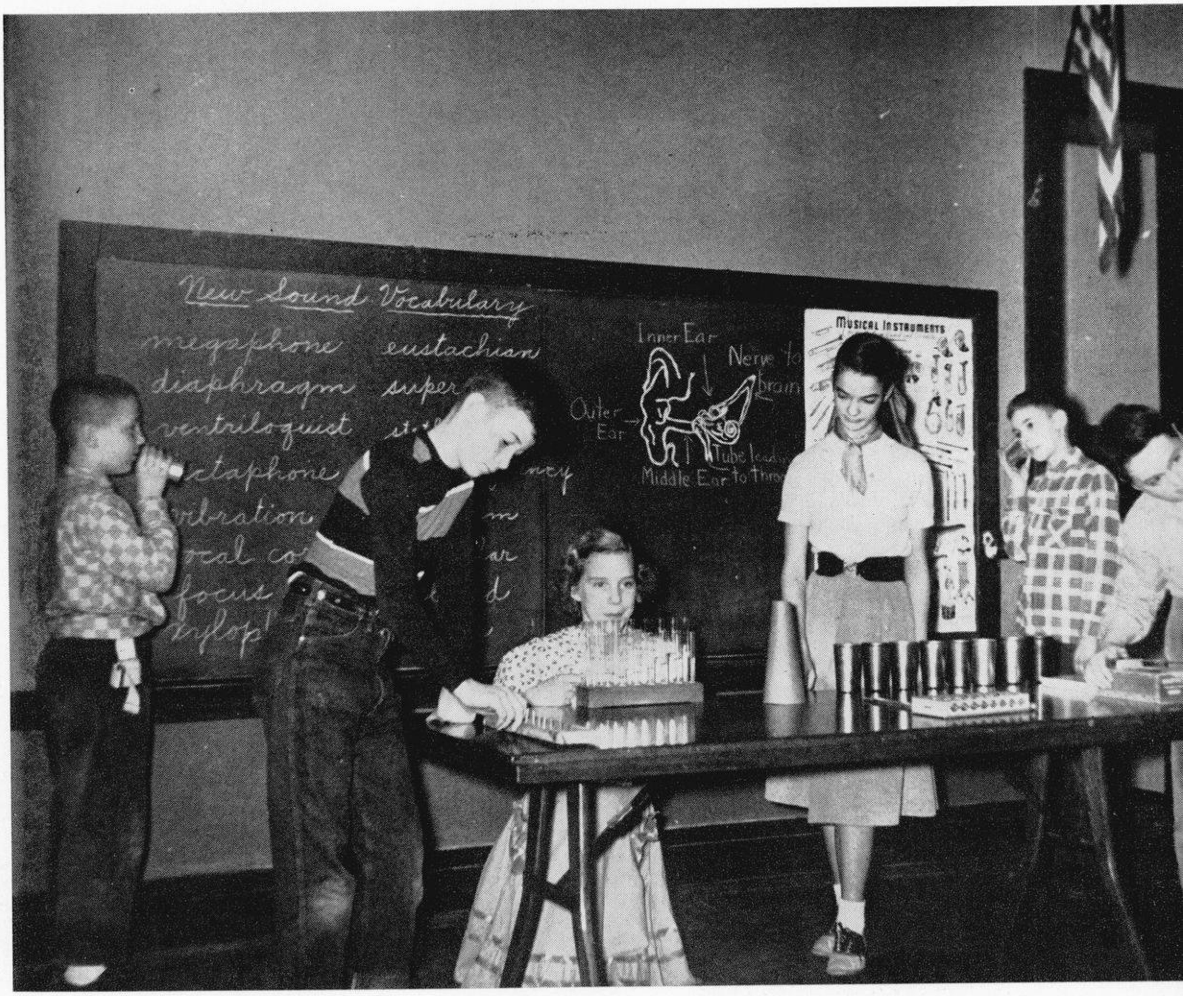
Bruce taps the tuning fork and plunges it into water to show his second grade classmates that it vibrates.

Science outside the classroom

Children begin to find out about "community helpers" through demonstrations at schools, as well as through watching them at work.

A telephone lineman comes to the classroom.

Children can soon assemble telephones provided by the local telephone company. Lessons in "Telephone Courtesy" is a phase of the study.



"There's music in the air" –

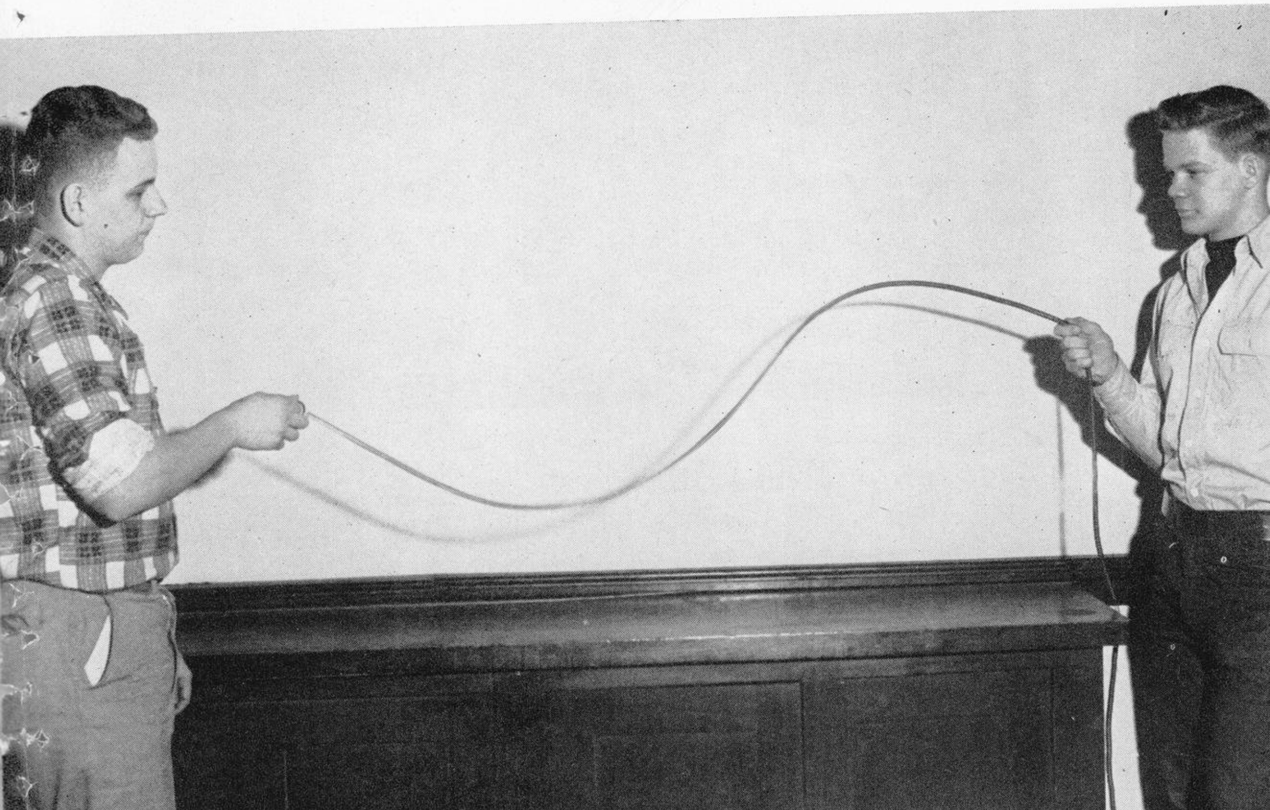
Sometimes pupils create their own instruments for experiments in sound. They learn to play tunes on a piano made of nails, test tubes holding different levels of water, and a cigar-box violin. They carry on conversations over tin-can telephones. Such projects provide pleasure as well as basic learnings in sound.

The noiseless bell

Phil and Charles discover that the bell can not be heard if all the air is removed from the bell jar by the vacuum pump. A vibrating tuning fork, causing the pith ball to jump about, demonstrates that sounds are vibratory in character.

Sound travels in waves.

These boys manipulate a spring to show in active form what a sound wave looks like—the nodes, anti-nodes, and parts of the wave. The pitch is determined by the number of vibrations per second. The wave length is inversely proportionate to the pitch—the shorter the wave, the higher the pitch. A jet plane roaring overhead illustrates the force of sound.



1100 feet a second

Sound travels through air at about 1100 feet per second. Many pupils will ask, "How do you know it travels that fast?" To find an answer to their question, they use a resonant tube and a tuning fork which gives data for the formula Velocity = Frequency × Wave Length.

Tuning up

Junior high pupils observe a demonstration with a sonometer. They learn that notes of different pitch can be produced by changing the length, tension, and size of vibrating wires, and thus obtain a better understanding of stringed orchestra instruments.

Light

For centuries men have been working to improve methods of producing light artificially. These children are learning how to make candles as one of the first steps in their study of artificial light.

Day and night, shadows and artificial lighting, all are usually accepted by young children as common daily experiences. As they become increasingly aware of their surroundings, they are interested in what happens and how it came about. What is light? Where does it come from? How is it carried from place to place? How does it form shadows? How does it help us to see?

Teachers often reply to this flood of questions by saying, "Let's try to find out". Simple experiments are suggested and carried out as a means of solving these problems. The children may test a variety of materials to see which are transparent, or they may compare the brightness of various sources of light. By making shadow pictures they learn that light travels in straight lines, and they learn the laws of reflection with the aid of light beams and mirrors.

Through the intermediate grades and junior high school this experimental problem-solving process continues as pupils investigate the more complex ways in which light behaves. They study cameras, telescopes, and other optical instruments in order to understand how lenses are put to use. Through experiments with prisms they also learn that white light is composed of a mixture of the many colors (of light) seen in the rainbow.

Gradually it becomes apparent to the children that many of the facts they have learned through experiences and reading are interrelated and interdependent. They learn that the factual statements predicting how light will behave under certain stated conditions become known as "laws" and "principles". They find that laws and principles enable them to solve many problems through reason and logic. Continuing experiences also develop the realization that there are many unsolved mysteries regarding the behavior of light, and that to fill these gaps in our knowledge, scientists have developed "theories".

In the senior high school, light is studied as a part of the course in physics. Pupils review and add to their store of factual information, more laws, principles, and theories. They learn more about the subject through mathematical studies and exact measurements of such things as the shapes and sizes of optical devices, the speed of light, color mixtures, and the angles of reflecting and bending light rays. They also study more of the theoretical explanations.

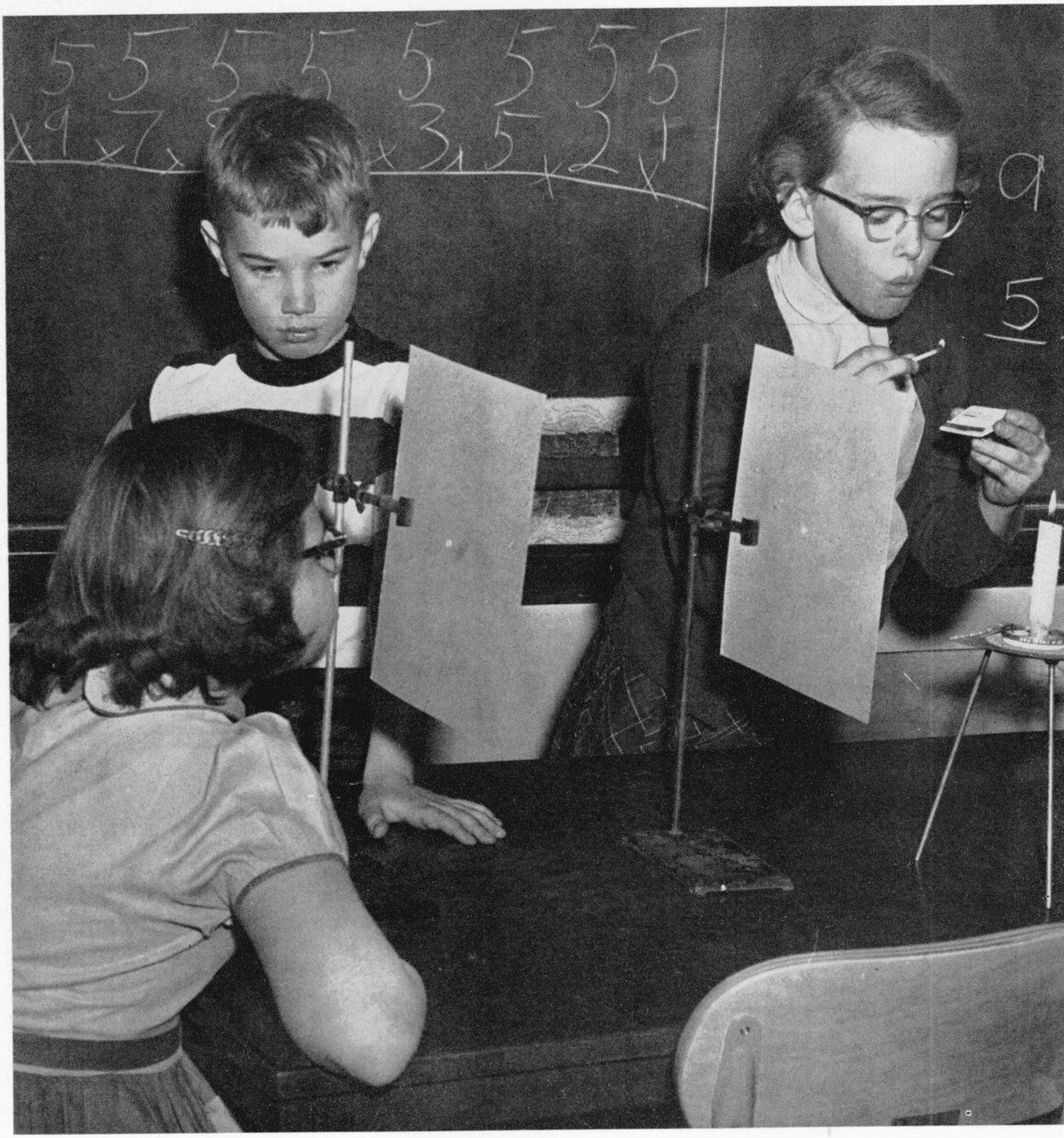
At this point the pupil has gained a working knowledge of light which is extensive enough to broaden his interests, to be useful in his hobbies, and to help him to become a more effective consumer and a better informed citizen. If he goes on to college, he has obtained a background for more advanced and theoretical studies.

From incandescence to fluorescence

Youthful scientists know many of the facts about light. They make candles, experiment with lamps, learn about the capillary action of lamp-wicks, and even delve into the chemistry of fuels.

Light travels in a straight line.

Fourth grade children set up apparatus to prove it. Lois sees the light when the holes in the cardboard and the light are in a straight line. However, light can be made to turn sharp corners by means of reflecting surfaces such as mirrors.

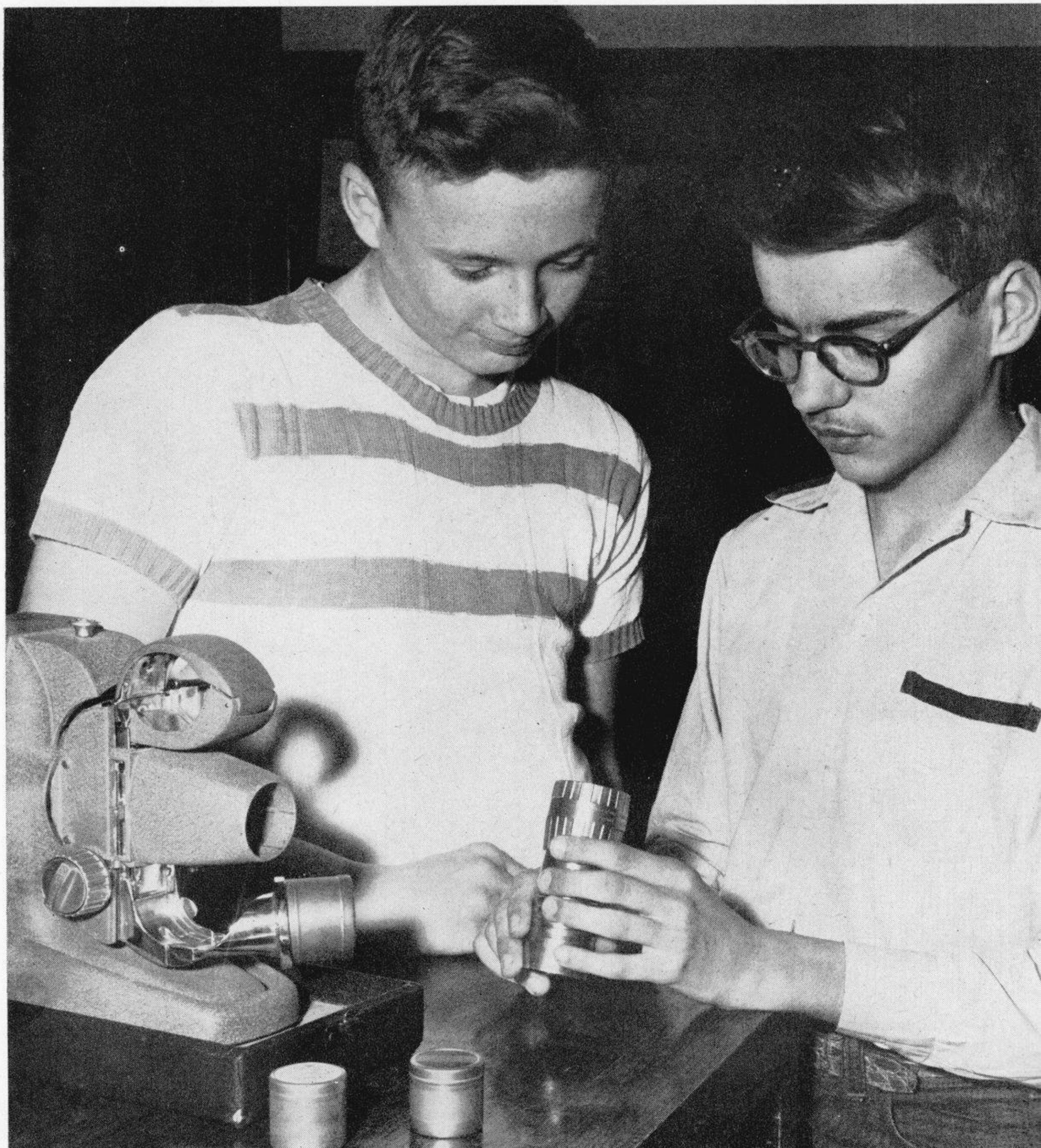


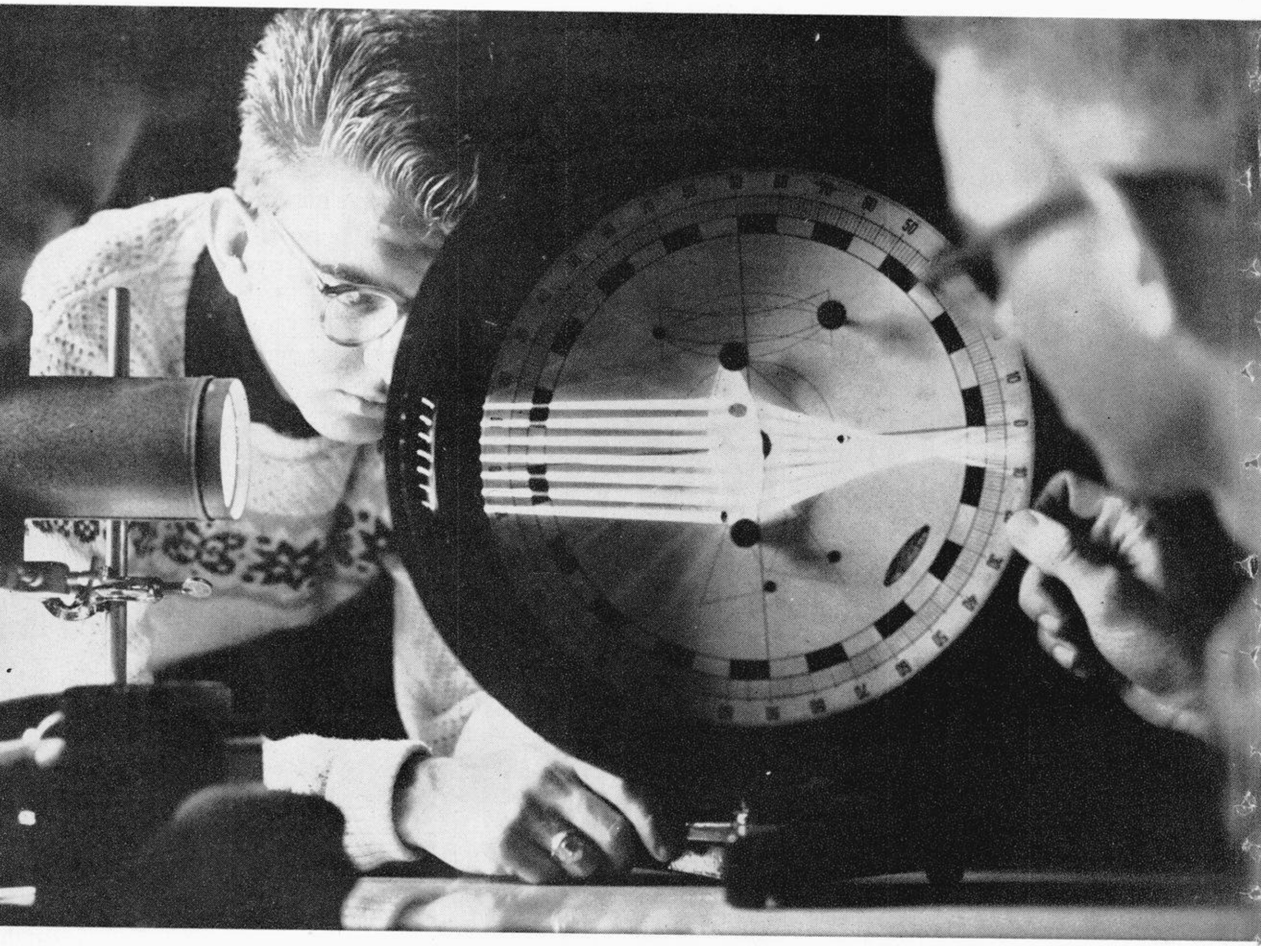
Her hands in the mirror

Mirrors, so common and yet so complex, are beginning to be understood in terms of scientific laws. Charlotte observes how the mirror reverses the image of an object. Further observation will help her to understand the law of reflection.

Good equipment requires careful handling.

The study of light helps boys and girls to understand the equipment used in taking and projecting pictures. They realize the importance of fundamental laws in the creation of new devices for work and amusement. Words like refraction, reflection, and illumination take on added meaning. Pupils can become competent operators of projection equipment.



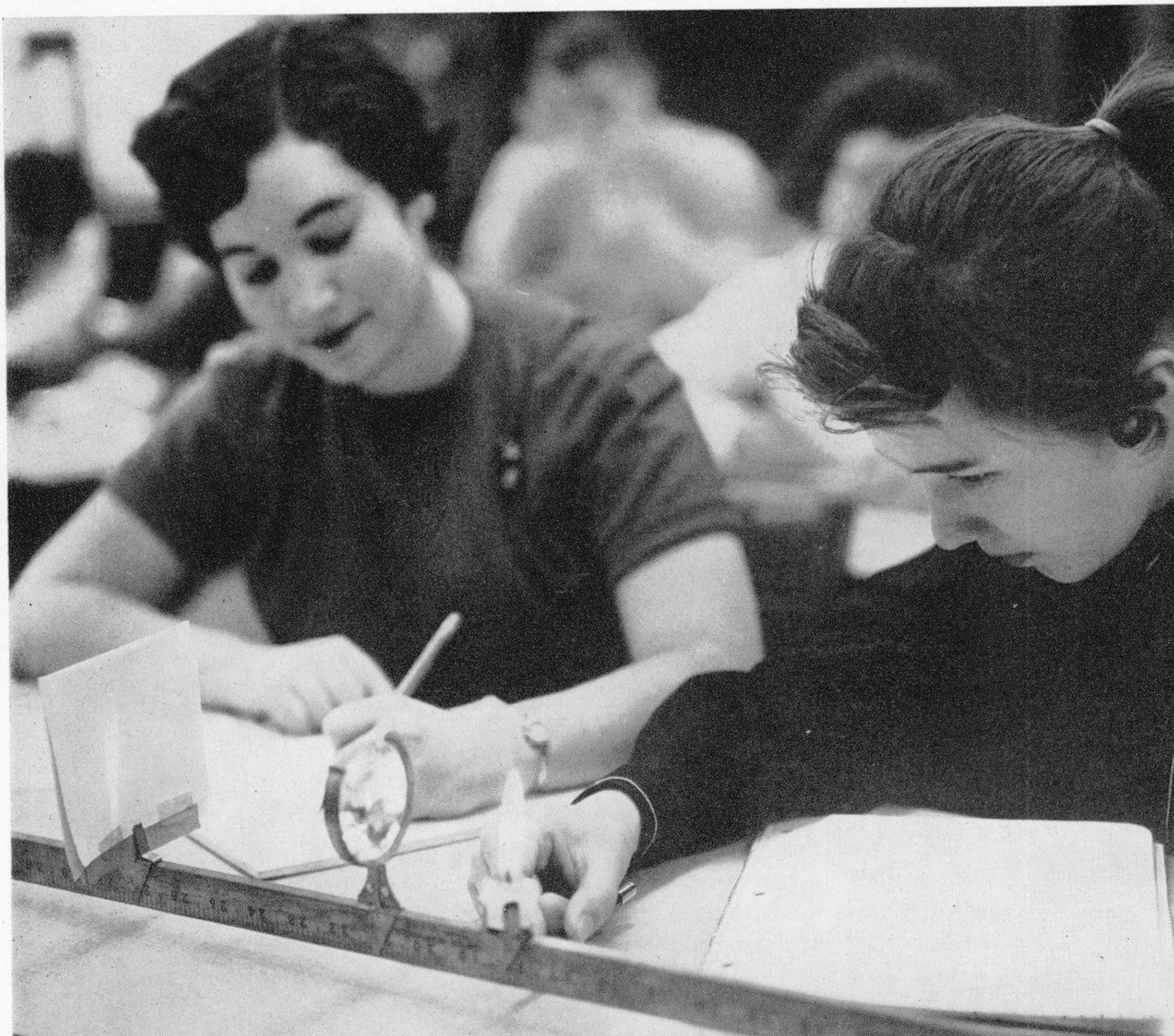


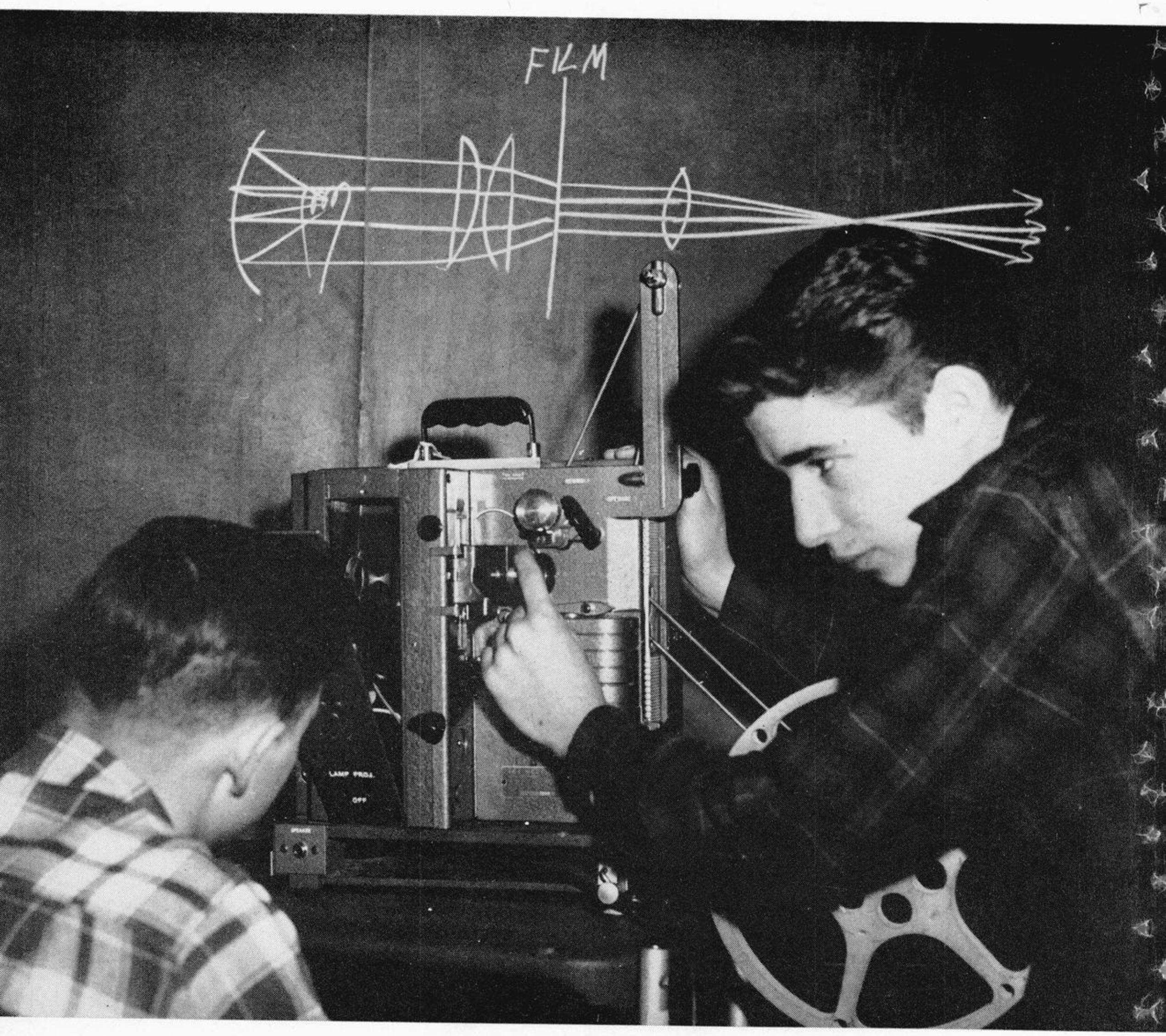
Tracing light rays

The boys have set up apparatus to show how parallel light rays from the projection lamp at the left are bent (focused) as they pass through the lens and meet at a common point. This behavior of lenses is put to practical use in the formation of images in such optical instruments as cameras, telescopes, and microscopes. The human eye operates similarly.

The mathematics of light

This simple apparatus consisting of ruler, clamp, paper, and lens is called an optical bench. The girls measure the distances from lens to object (candle) and lens to image (screen). They also compare the size of the image with the size of the object, using the results of their calculations to prove a mathematical formula in the textbook.



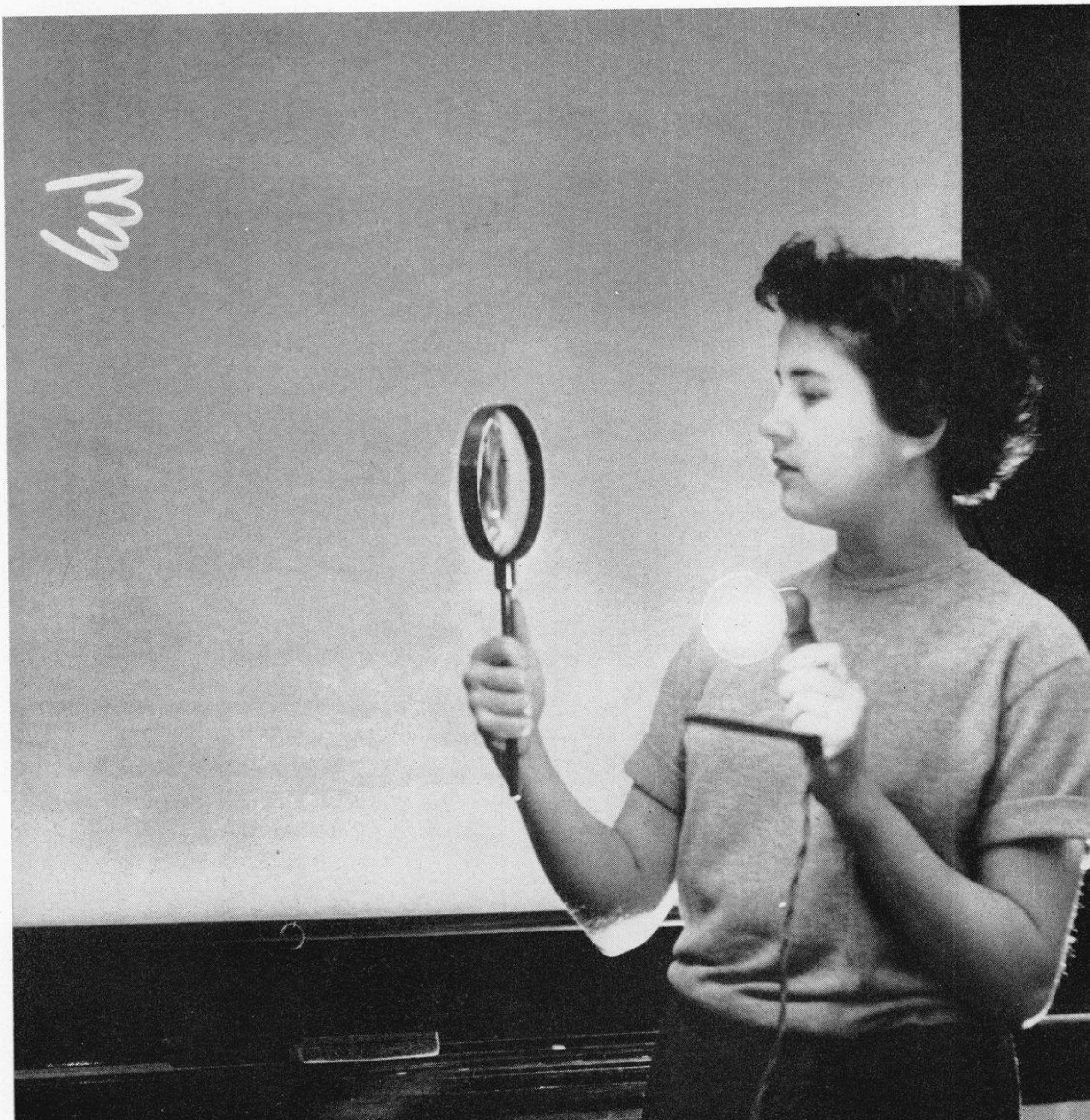


Lenses at work

On the blackboard is a simplified diagram of the optical system—light source, mirror, and lenses—of a motion picture projector. The projector is one illustration of the way in which the laws of lenses and mirrors are put into practical use.

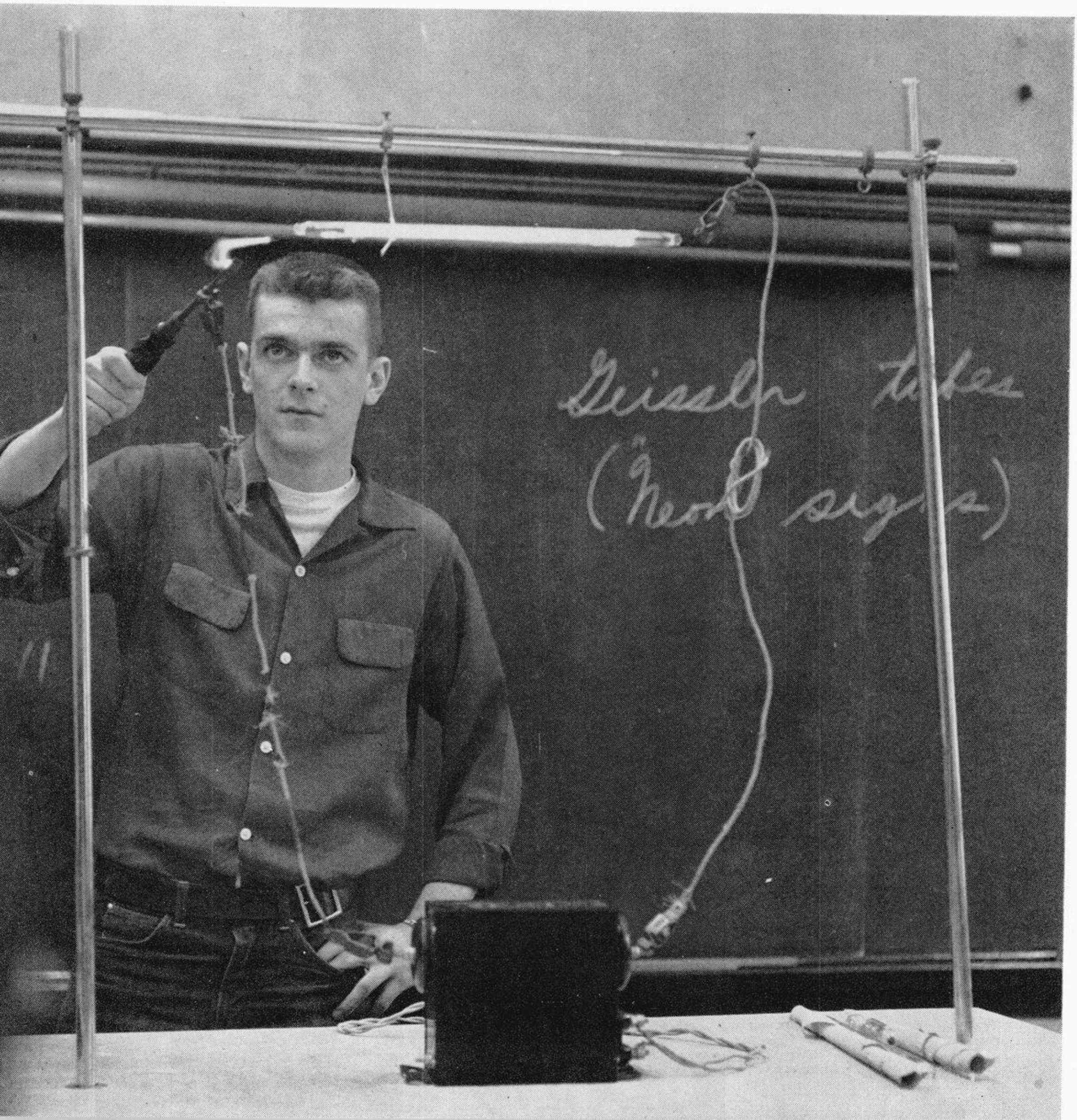
Forming an image with a simple convex lens

Using a simple lens, Nancy projects an image of a glowing light bulb filament on the screen. She observes the distances between the lens and bulb and the lens and screen, and the comparative sizes of the lamp filament and the reverse image.



High-voltage lighting —

Dick demonstrates the behavior of a Geissler tube which is almost completely evacuated. The tube contains a trace of neon or some other gas or combination of gases, and has a metal electrode sealed into each end. He applies 15,000 volts from a transformer to one end of the tube to make it glow. The tube can be bent into a variety of designs, familiar to everyone as "neon" signs.



History of the Science Program

The history of the science program in the Madison public schools covers a period of a hundred years. When the second annual report of the Madison public schools was published in 1856, there were four schools. One of these was the central or high school in the Congregational church on Webster Street. Among the courses offered were chemistry and physiology.

The next year, in 1857, the annual report carried the complete course of study. Physiology was taught in the grammar school (probably in the eighth grade). The high school offered physiology, physical geography, astronomy, geology, and the applications of the sciences to agriculture.

Other science subjects offered in the high school during the early years were botany and zoology.

In 1872, the course of study as printed in the annual report included a brief statement of what the children of each grade could be expected to learn in science. For instance, in the fifth grade under mammals were listed the kinds of mammals, such as two-handed, four-handed, flesh eaters, insect eaters, amphibious, gnawers, and cud chewers.

Eight of the 14 pupils in the graduating class of the high school in 1875 were enrolled in the scientific course. This course included one or more terms —fall, winter, spring—of six previously-mentioned science subjects and natural philosophy (physics). Nine first honors in natural philosophy were awarded to pupils in the graduating class.

By 1885 the science course of study for the primary department included the following:

First year, oral lessons on plants and native animals; second year, oral lessons on plant productions, the human body, and flowers. But no more science was offered until the second year of high school.

Apparently, little or no laboratory work was done in the schools, for in his annual report for that year the superintendent began to urge experimental work in science.

In the early 90s, the high school principal in his annual report deplored the lack of space in the old high school building for laboratories and suggested an annual appropriation for equipment. During the school year 1891–92, science was taught in every grade of the ward schools and high school, ending with psychology in fourth year high.

In his report for the year, 1894–95, the superintendent expounded at length on the science program of the elementary schools. The following statement of purpose of the teaching of elementary science was exactly the same for the next 16 years.

"In the lower grades more attention has been given to nature study, and the main purpose has been to train the pupils to observe, compare, distinguish, and to combine—to think. Another aim has been to so conduct the exercises as to inspire the children with a love of the beautiful and with a sympathy for all living things, and to teach them how to preserve and protect plants rather than to dissect them. . . ."

Prof. E. A. Birge, chairman of the high school visiting committee for the school year 1895–96, reported on the program. He was head of the University science department and later became president of the University. His report read as follows:

"In science there is the greatest room for unfavorable criticism; not so much in teaching as in equipment. The school is fairly provided with apparatus, but is entirely without proper laboratories. At least two laboratories are imperatively needed if the scientific instruction is to be at all adequate to the needs of the school and the city. . . . A couple of old tables on one side of a recitation room may take the place of a laboratory in a poor and small school, but are wholly inadequate to the needs of our students."

This report evidently brought results, for in 1897–98, the high school principal commented on the improved laboratories and urged more equipment, as follows:

"Additional laboratory room has been a great convenience, not only in physics, but in all science work. As far as room is concerned our three laboratories are quite equal to our needs at present."

But his satisfaction in the laboratories must have been short-lived, for in 1900 the high school visiting committee was sharply critical of the inadequate apparatus and the laboratories—physics in a basement room and two other science rooms in the attic. The committee insisted on fire escapes. Their apprehension was justified when fire broke out near the physics room on the third floor of the high school building February 27, 1906, at 2:50 P. M.[1] The 650 pupils were quickly evacuated from the building.

The fire evidently hastened the building of the new high school, plans for which had been completed in 1904.

The new high school (Central) with better facilities was finally completed in 1908. The superintendent's report for that year contained descriptions and pictures of various rooms, among them the biological laboratory.

According to a picture in the report for the school year 1914–15, the high school had a "wireless" station. No mention was made of the project.

Wartime activities such as gardens, savings, emphasis on health and diet, were reported in 1918. No annual report was printed again until 1923–24.

Health instruction became part of the physical education program in the early 20s.

As far as the general categories are concerned, the science offerings in the junior and senior high schools have been the same for a number of decades. But the content has been constantly adjusted to fit the times. There has been some variation in the three junior-senior high schools and in the general, vocational, and college-preparatory courses.

In the report for the year 1934–35, the program of natural science for grades 4, 5, and 6 was printed. In general, the theme for grade 4 was neighborhood science; grade 5, knowing and conserving the beauty of the community; grade 6, what man has found out about the earth. The plan was to proceed

[1] Date of fire supplied by Mr. Ralph C. Reda, Madison Fire Department.

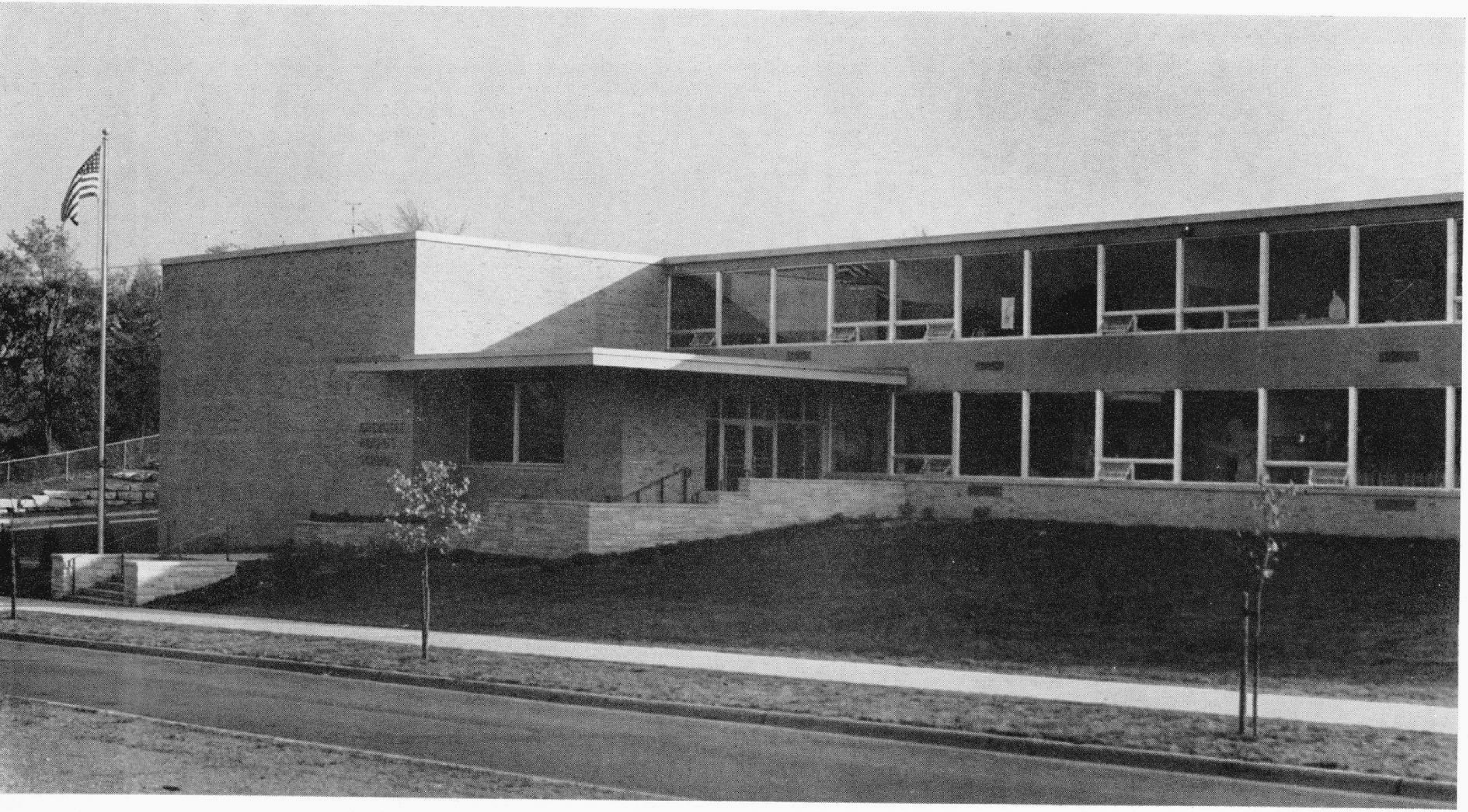
from the child and his immediate interests and surroundings to the more distant in time and space.

At that time science instruction in the primary grades was incidental. But teachers soon began working on science units for the primary grades. As these units were completed, they were duplicated and shared with other primary teachers, not only in Madison but also throughout the country.

In 1936–37 five general committees, including a committee on science and mathematics, were set up for the purpose of working on the secondary school curriculum.

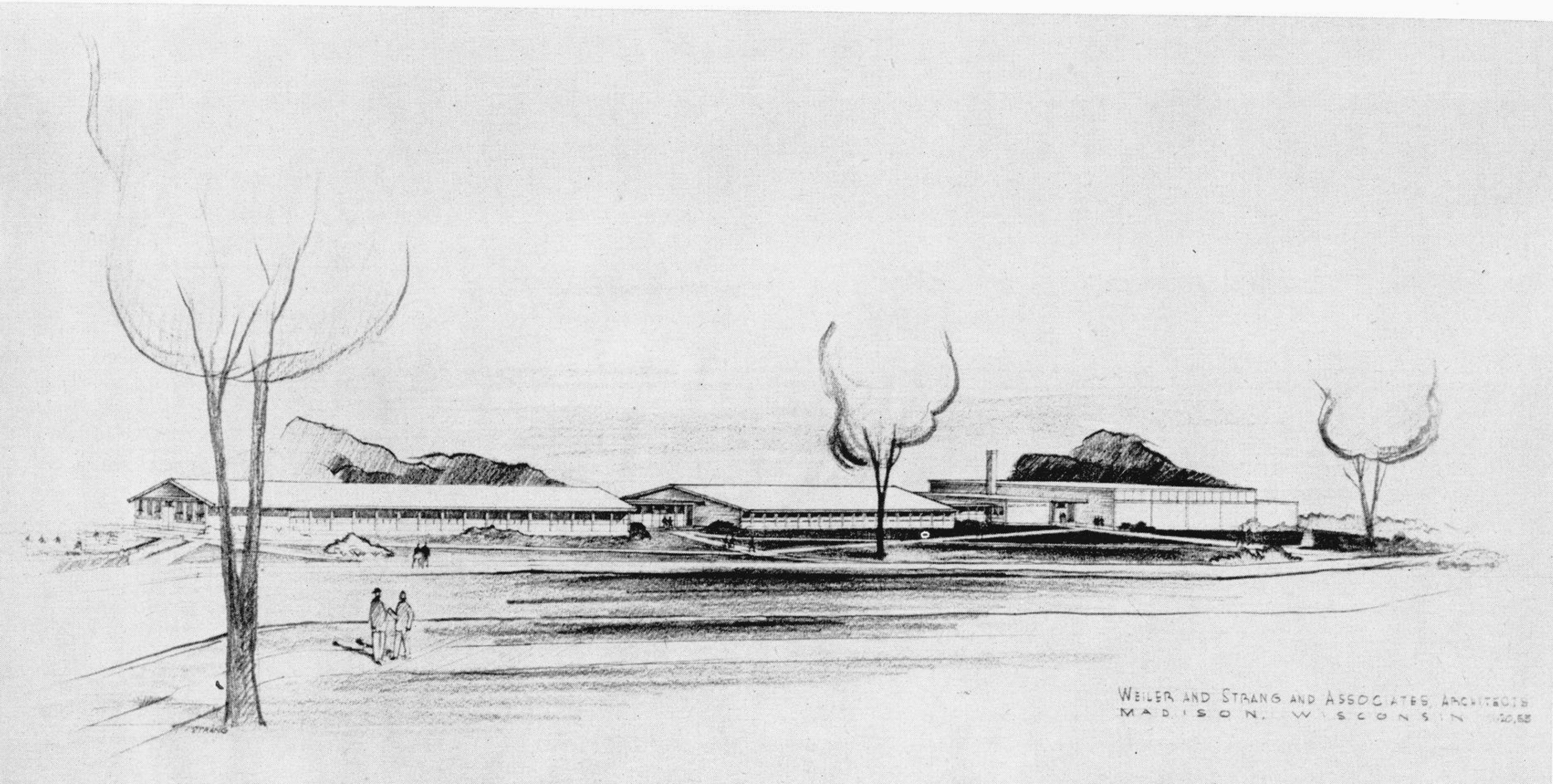
During World War II, courses were modified to fit war-time needs. Additional emphasis was placed on high school mathematics and science courses and physical education. Aeronautics and advanced biology were added to the curriculum.

Study and improvement of the science program has continued in the postwar years until today there is real effort to give all children basic science instruction and to make provision for the gifted students who may have careers in science. Members of the school staff work to establish worthwhile goals, to have an instructional program geared to children at their various stages of development, and to have the necessary supplies and equipment to put the science program into action. Through the science program they hope to develop citizens who understand the role of science in everyday living, and to increase the supply of trained scientists that the modern world demands.



Cherokee Heights School

Hoyt School



PROPOSED EAST HILL FARM ELEMENTARY SCHOOL, MADISON, WISC.

FOR THE RECORD

Additional School Sites

Spring Harbor

At the meeting December 6, 1954, the Board voted to request the mayor and Common Council to purchase as a school site approximately 7 acres of land west of Spring Harbor park from the Warner heirs for $21,500, funds to be taken from the school bond account. The city auditor made direct payment January 5, 1955.

University Hill Farm

Although the Board began the study of the University Farms area for a school site in the spring of 1953, the actual purchase took place in August, 1955. The 22.11-acre site was purchased from the University of Wisconsin with funds from the bond account at a cost of $2,750 per acre or a total cost of $60,802.50, according to a report to the Board August 28, 1955.

Waunona Way

At the meeting March 19, 1956, the Board formally approved payment of $7,600 by the city auditor directly from the school bond account to the owners for 3 acres of land in the Waunona Way area for a school site.

School Bond Issue

On January 3, 1955, the Board acted to request the Common Council for issuance of $3,420,000 in bonds to finance the construction of schools, including purchase of equipment and land. Also included was a request that the city attorney prepare a resolution for submission to the Common Council initiating the bond issue and providing for a referendum April 5, 1955.

Voters approved the school bond by a ratio of more than 6 to 1. More than 86 per cent of those who voted on the issue approved the school bond; 13.6 per cent voted against it.

At the April 18 meeting the Board voted to send a letter to the Madison PTA Council, commending and thanking them for their excellent work on the school bond referendum.

Cherokee Heights School

Opening for the 1955–56 school year, this combination elementary-junior high school will eventually be primarily a junior high school. Enrolled during the first year were 754 children, kindergarten through grade 7.

The two-story, L-shaped building has 27 classrooms besides the special-purpose rooms. Grouped around the foyer of the main entrance are the gymnasium, all-purpose room, school office, and library.

Extending along one wing of the first floor are the kindergarten and elementary classrooms. Completing the other wing are five laboratories for art, home economics, and industrial arts. The second floor contains 20 typical junior high classrooms, two music rooms, and a science room.

The exterior of the building is light brick with blue porcelain trim and many plate-glass windows. Interior walls are cinder block tinted in soft pastels with accents of dark green and earth brown.

Like other recently built schools, this new school has blonde woodwork, natural-finish furniture, green chalkboards, and asphalt-tile floors. Ceilings are soundproof.

The total budgeted cost of the school is $1,250,607, of which $1,030,771 is in base construction contracts.

More than 1,000 persons attended the dedication program in the new school Sunday, October 22, 1955. The cornerstone ceremony had been held August 15. During the period of construction, the school was known as the Crawford Heights site school.

Hoyt School

At the meeting June 6, 1955, the Board voted to request the mayor, Common Council, and park commission to return to the Board the school site in the Hoyt Park area which had been abandoned as a school site in July, 1946, when Midvale was contemplated.

By August an architectural firm had been employed to construct an elementary school of eight classrooms, a kindergarten, and an all-purpose room. The redwood and Kasota stone school in the wooded area was to be ready for school opening in September, 1956.

The Board named the school for Frank W. Hoyt,[1] the "grand old man" of the Madison parks system, at the meeting May 7, 1956. Mr. Hoyt was treasurer of the Madison Park and Pleasure Drive association for 40 years and helped to raise more than $400,000 to purchase land for parks and drives for the city. He and Mrs. Hoyt contributed part of the land in Hoyt Park.

The total budgeted cost of the school is $368,993.50, of which $308,826 is for base contracts.

University Hill Farm Site School

The Board approved tentative plans for the first three-section elementary school on the University Hill Farm site at the meeting October 17, 1955. Bids were opened June 28, 1956. The building is to be completed in time for school opening in September, 1957.

An innovation of the new school will be the reduced window area with special permission from the Wisconsin Industrial Commission for the exception to the school building code. Providing a vision strip will be classroom windows about four feet high.

Additions to Schools

Herbert Schenk

The Herbert Schenk addition of 12 classrooms was ready for school opening in the fall of 1955. The budgeted cost is $255,948 with base contracts of $200,405.

[1] Mr. Hoyt's father, Lansing W. Hoyt, was a member of the Board of Education 100 years ago in 1856, according to the second printed annual report. The next annual report listed him as treasurer with his term expiring in 1859.

Franklin

Opening for the second semester in 1956 was the new Franklin school wing of eight classrooms and a teachers' room. Also included in the contract were the complete rebuilding and renovation of the home economics room, shower and locker rooms, and extensive renovation of the gymnasium.

Dedication of the new wing was held January 29, 1956 at 2:30 p. m.

The total final cost was $187,765.94, of which $160,160.81 was in base contracts.

Mendota

Contracts were awarded March 19, 1956, for the fourth addition of Mendota school and May 2 for the fifth addition. The fourth addition consists of six classrooms and two kindergartens, and the fifth, gymnasium, locker rooms, and school office.

The total budgeted cost is $317,422.50 of which $278,025 is in base construction contracts.

Cherokee Heights School Boundaries

The Cherokee Heights elementary school district is the area in Nakoma west of Waban Hill, Nakoma Road, and Whenona Drive. The Cherokee Heights junior high school district includes the elementary school districts Nakoma, Midvale, Hill Farm area, and Dudgeon area west of Gilmore street.

Optional to Cherokee Heights junior high or to West junior high is the Dudgeon area east of Gilmore street and the Hoyt district south of Regent street.

Truax Field Runways and School Sites

At the Board meeting June 4, 1956, the superintendent reported on a land-use map prepared by the city-planning office for the Mendota–Lakeview area. He indicated some of the plans for extension of runways at Truax Field and their possible effect on the Mendota school, a proposed school in Lakeview Heights, and the Sunnyside school.

Administrative Changes, Additions

John Thrower

John Thrower, psychiatric social worker, became school social worker in the department of child study in September, 1954. He replaced August Vander Meulen who had been in charge of attendance, visitation, transportation, and census. Mr. Thrower came to Madison from Leavenworth, Kansas, where he worked as a psychiatric social worker for the United States Army Disciplinary barracks. His duties include attendance and visitation, and group and individual social work.

Bernice E. Leary

Bernice E. Leary, curriculum consultant of the Madison public schools since 1942, retired at the end of the school year 1954–55. She made countless contributions educationally to the children and teachers of Madison during her period of service. She authored "Learning to Read in the Madison Public Schools," the biennial report for 1943–45, which was reprinted in 1949.

Miss Leary and curriculum committees together have turned out many bulletins and guides for use in the schools. Requests for copies, which are sold at cost, come from many other cities, states, and foreign countries.

Miss Leary is continuing to share her talents by serving as a reading specialist to foreign lands through the sponsorship of the federal government. Three times during her tenure in Madison the Board of Education granted her leaves of absence for this special service—twice to Germany and once to Thailand.

Emery Bainbridge

Principal Emery C. Bainbridge, Emerson school, was appointed acting principal of new Cherokee school June 3, 1955. Previous to entering the Madison school system, Mr. Bainbridge was principal of the elementary-junior high school at McFarland.

Mabel Hammersley

Mrs. Mabel Hammersley, science teacher at Emerson school, was appointed acting principal at the meeting June 3, 1955. She has taught at Emerson since 1929.

Arthur H. Mennes

Arthur H. Mennes became curriculum consultant for the Madison public schools in August, 1955. Formerly principal of Central high school, Sheboygan, Mr. Mennes had lived in that city 14 years. Previously he taught in Minnesota schools.

A native of Wisconsin, Mr. Mennes received his BA from St. Olaf's and his MA and PhD from the University of Wisconsin. He also did graduate work at Cambridge, England.

Charles Wirls

Charles Wirls, clinical psychologist, became assistant in the child study department September 1, 1955, replacing Donald Bratrude who resigned half time to go into private practice. Mr. Wirls came to Madison from the Children's Aid Society, Cleveland, Ohio, where he had been chief psychologist for the past three years.

Lucile Clock

In March, 1956, the Board approved the request of Principal Lucile Clock to be relieved of administrative duties and return to kindergarten teaching. Miss Clock had been principal of Dudgeon school since it opened in 1927 and prior to that, teacher at Randall school.

Dorothy Rule

Dorothy Rule, sixth grade teacher at Midvale school, was named teaching principal of new Hoyt school by the Board of Education at the meeting June 4, 1956. Miss Rule has been with the Madison public school system since 1934. She taught at Randall school before going to Midvale when that school was opened in 1951.

Miss Rule received her degree from the University of Minnesota and taught at Bangor before coming to Madison.

Alonzo L. Anderson

The Board approved the appointment of Alonzo L. Anderson acting principal of Dudgeon school at the meeting June 13, 1956. Mr. Anderson taught at Dudgeon four years. He received his BA from Milwaukee State College and his MA from the University of Wisconsin.

Art Department Report

One way of evaluating the art program is to observe the work displayed at the annual Salon of School Art, and the exhibits held in the various schools in cooperation with PTA meetings. Another means of evaluating the art program is to see the work in individual classrooms where art is used to extend science, social studies, reading, and other school subjects. Art work for school plays and programs also shows how it enriches school activities.

Many features of these exhibits show the trend the art program is taking.

First: There is conscious effort on the part of the art teachers to build a broad program which will stimulate the imaginations of all children. There is an increasing emphasis on the creative use of a wide variety of materials. (The "materials approach" is a recent development in the teaching of art.) Children are encouraged to create in two as well as three dimensions.

Second: Painting and drawing projects which involve the expression of the child's feelings and emotions are carefully balanced with the crafts, or "materials" part of the program.

Third: Paintings, drawings, murals, and constructions which include observations are not being neglected but re-emphasized on a personal basis.

Fourth: Crafts involving special hand tools, machine tools, copper enameling and ceramic kilns are also being used increasingly in the program. Through the use of this special equipment, we are not only able to stimulate more children but also to teach them how to use tools for creative projects.

Behind the art program is a staff of 25 art teachers who often gather for after-school workshops to experiment with new materials and with old materials for a new approach.

The art department has participated in a number of parent-pupil and parent-teacher art workshops devoted to actual experimenting with materials the children use in school. Parents have enjoyed working with paint, clay, plastic, copper enameling, and finger paint and have developed a better understanding of the art program and the creative approach to art.

—Ruth Allcott, *director*

Child Study and Services

Guidance and special services continue to be provided on a decentralized plan. On the elementary level speech correctionists, visiting teachers, and psychologists operate on an itinerant schedule. Six speech correctionists, two psychologists plus one half time, three visiting teachers, and one remedial reading teacher serve the 16 elementary schools.

On the high school level two full-time guidance counselors serve each high school, assisted by members of the department of child study when need is expressed. One work-experience coordinator, four-fifths of the time of two of the visiting teachers, and a part of the psychologists' time is planned for grades 7–12.

Group counseling or therapy has been extended down into the elementary schools. This past year 91 children were seen in groups of 5 to 10 in an effort to assist them in working out various problems which in some way have seemed to effect their school adjustment. This plan is in keeping with the emphasis being placed upon "prevention and remediation" at as early a time as possible.

In addition to supervision of guidance in coordination with building principals, the department has responsibility for directing one rest and nutrition center at Washington school, four classes for the deaf and hard of hearing and one sight-saving class at Lapham school, seven classes for the mentally handicapped located at Longfellow, Lowell, and Central, one trainable class at the south side Neighborhood House, the Orthopedic schools at Washington and the State Hospital, instruction for the homebound, and remedial reading in four schools.

On May 16, 1955, the Board elected Miss Ruth Woodworth as teacher of Madison's first class in braille for totally blind children. The class was housed at Lapham school. Four children were enrolled during the first year, 1955–56.

—Carl H. Waller, *director*

Curriculum Study

For many years the Madison schools have identified curriculum problems and have shared the best practices of all the school personnel. This means working together on a cooperative approach to curriculum planning which includes all grade levels from kindergarten through grade twelve.

Curriculum study and improvement—through teacher committees, study groups, and faculty meetings have one common task—that of improvement of the learning experiences for the children in the Madison schools. The activities of the various committees obviously are many and varied.

Curriculum improvement for the school year 1954–55 centered in the social studies program for the elementary grades. A total of 51 teachers, principals, and librarians served on committees, while all teachers recorded classroom experiences used in the development and publication of social studies units.

At the opening of the school year 1955–56, all teachers answered a questionnaire concerning curriculum suggestions for the Madison schools. This study has been the basis for curriculum organization, activities, and study this year and could be summarized as follows:

1. The city-wide curriculum planning council of 22 teachers and administrators acted as a steering committee offering suggestions, pooling ideas and opinions concerning curriculum needs for our children.

2. Twenty study groups dealt with special curriculum problems as chosen and studied by the faculties of individual buildings. Over 100 teachers participated in these study groups.

3. A 40-member city-wide committee studied the language arts curriculum from kindergarten through grade 12. This committee will continue its study during the coming school year.

4. A 30-member city-wide committee studied and evaluated the social studies program from grades 7 through 12. This committee will continue its work during the school year 1956–57.

5. A 27-member city-wide audio-visual aids committee made a study of further use and improvement of our visual materials and services.

6. A 50-member committee evaluated supplementary textbooks to be recommended for use in the Madison schools. Six committees totaling 40 members selected basic textbooks in third grade reading; in English grammar for grades 7, 8, 9, and 12; and in high school general science, biology, bookkeeping, and business English.

7. A 6-member committee revised a previous bulletin on health education.

8. Testing and evaluation. Achievement and reading tests were given to all pupils in grades 1 through 6. Also, achievement tests were administered to all pupils in grades 9, 10, and 11. Special attention was focused on achievement in written expression for grades 10 and 11.

Teacher participation on curriculum study and in-service education have produced excellent results. The procedure of working cooperatively on curriculum problems which individual teachers or groups of teachers encounter has helped to improve the learning experiences of our Madison boys and girls.

—ARTHUR H. MENNES, *consultant*

Music in the Madison Public Schools

Vocal music is elective in grades 9 through 12. More than 1,380 pupils were enrolled at this grade level in chorus classes and choirs during the 1955–56 school year.

All instrumental music is elective. During the last school year over 1,450 pupils played standard band and orchestral instruments, grades 5 through 12, about 95 per cent of whom began their instruction in the Madison public schools.

Each of the 4 junior high schools and Franklin school have elective boys' glee clubs, girls' glee clubs, and mixed choruses. In these groups, there were over 916 voices.

All children of the primary grades receive a minimum of 60 minutes, upper grades 90 to 120 minutes, and seventh and eighth grades 100 minutes of music instruction a week.

In addition to regular music classes there were select choirs of fifth and sixth graders in each of the 16 elementary schools, totalling 910 voices.

Over 1,000 high school pupils presented a Spring Music Festival at the University of Wisconsin Stock Pavilion. Many felt we had reached our highest standard of performance.

Each senior high school band played from 50 to 58 public or school performances. We were able to parade six public junior and senior high school bands on Memorial Day.

All 16 elementary schools were represented in a 54-voice All-City Boys' Choir. All rehearsals and concerts were on out-of-school time. It was organized to provide an opportunity for gifted singers and to develop interest in boys' singing through junior high school.

—LEROY KLOSE, *director*

Health, Physical Education, Recreation, Safety

Physical Education

Physical education in Madison's 19 schools is taught by 31 teachers of physical education: 16 in the elementary schools, 12 in high schools, and 3 dividing time between elementary and high schools.

First, second, and third grade children are assigned physical education teachers for one or two 30-minute periods a week. Fourth, fifth, and sixth grade boys and girls are separated, men teachers taking the boys and women teachers meeting with the girls for physical education activities which require 135 to 150 minutes per week. Most classes number no more than 35 children.

Junior and senior high school pupils are required to take part in physical education two or three periods per week, where facilities permit.

All elementary schools offer an after-school intramural sports program for fifth and sixth grade boys and girls once or twice a week.

Intramural activities for all junior high girls are available two afternoons a week after school and to junior high boys on Saturday afternoons.

An intramural program for senior high girls is offered two afternoons a week.

Senior high school boys take part in an extensive interschool program which includes competition in football, basketball, volleyball, baseball, track and field, cross country, curling, hockey, tennis, golf, and wrestling. Approximately 1,000 boys from the three junior and senior high schools took part in the interscholastic program in the school year 1955–56.

Health

A one-semester health education course in grade 11 is now required of boys and girls in two of the Madison high schools. This course is being taught by senior high school men and women physical education instructors.

The Madison health department organized the Salk polio vaccination program in our schools and 89 per cent of our first, second, third, and fourth grade boys and girls received two shots of vaccine.

The health department has also been active in the mobile chest x-ray program. There were 6,357 chest x-rays taken as part of our school program. The Board of Education requires that all school employees have a biennial chest x-ray.

Safety

The bicycle-safety teaching program has been carried on for several years. Classroom teachers, physical education teachers, and the Madison police department cooperated in presenting the program. The classroom teachers covered ordinances and safe-riding rules, the physical education teachers taught skillful riding of bikes, and a member of the Madison police department gave a talk in each school, reviewing the ordinances which apply to bike riders and auto drivers, and explaining the work of the Madison Bicycle Court.

Recreation

The recreation program has expanded as the schools and city have grown. Twelve school buildings were used in the winter season for children's Saturday school recreation centers, six of them being used Friday and Saturday evenings for teen-agers. Adults attended activities in seven buildings.

Ninety-seven men's and women's teams played basketball and 43 teams played volleyball. The softball program for men and women enrolled 109 teams, baseball enrolled 22 adult teams, and boys' baseball, 108 teams.

Thirty-five playgrounds were in operation under the direction of a full-time staff of 70 leaders and supervisors.

The Madison Theatre Guild presented 33 performances of 6 different plays to audiences which totaled 16,000 persons. The Summer Youth Theatre toured the playgrounds, presenting a different production each week on the "Stagecoach".

The Madison Community Center continued its wide variety of program activities for senior high school "Loft", for the Young Adult Club, for the Older Adult Club, and for the Golden Age Group. In addition, the building was used for a great many meetings by many groups of Madison residents.

—GLENN T. HOLMES, *director*

Revised Policy on Evening Use of Schools

Following is the revised policy on evening use of schools adopted by the Board, December 5, 1955. The requests falling in these categories may be granted and permits issued by the supervisor of buildings and grounds without further action of the Board.

1. Organized groups such as boy scouts, girl scouts, cubs, brownies, Y.M.C.A., Y.W.C.A., and Junior Optimists, without cost, provided there are no overtime costs involved and they comply with the following schedule for their regular meetings:

Age	*Midweek*	*Weekend**	*Adult Supervision*
8–9–10	6:30 to 8:00	6:30 to 9:00	1 adult per 5 children
11 to 18	6:30 to 8:30	6:30 to 10:00	1 adult per 10 children

* Friday or night before school holiday.

2. All requests from PTA's, mothers' clubs, parent-study groups, pre-school and kindergarten groups, scout committees of parents, den mothers, etc., without cost, provided there are no overtime costs.

3. Requests for use by city officials for holding hearings, voting booths, etc., without cost except for overtime which may be charged.

4. Recurring requests by outside groups which have previously been approved by the Board, cost rate and overtime to be charged in this category as previously determined by the Board of Education.

All the above permits granted by the supervisor of buildings and grounds to above groups, unless otherwise indicated:

1. Shall meet the minimum attendance requirement of the Board which according to the minutes of the Board of Education April 20, 1936, is as follows: "When the group meeting is less than 10 persons it is believed that the logical place for it is in a home rather than in a school. Therefore, when the attendance falls below 10, any permit granted by the Board shall be discontinued. If the number attending is less than 50, it would not justify meeting in one of the small auditoriums; if it is less than 200, it would not justify a meeting in one of the high school auditoriums."

2. Shall not involve any overtime costs to the Board of Education.

3. Shall not be issued, or shall be revoked if issued, if previous use of a building by a requesting group has resulted in unsatisfactory conduct by participants or unsatisfactory care in the use of the building.**

The supervisor of buildings and grounds shall report to the Board of Education at each regular meeting, through the agenda of the superintendent of schools, all permits issued under the above policies since the last meeting of the Board.

Federal Aid

Federal assistance first became available to the Madison public schools during the 1953–54 school year. Under Public Law 874 the federal government agreed to give financial aid to a community when 3 per cent or more of its pupils in average daily attendance had parents who lived on or worked on federally owned property. However, pupils of parents working on federal property but serving purely local needs, such as postal employees, could not qualify.

The reactivation of Truax Field and the staffing of the Veterans' Hospital enabled the Madison public schools to qualify for aid. The Board received the report that on December 15, 1954, an aid check had been received from the federal government in the amount of $44,730.94 to cover the 1953–54 school year. Since this original qualification, the Madison public schools have continued to meet the requirements of Public Law 874 and have received federal aid.

Integrated School District

Madison was again declared to be an integrated school district by the state department of public instruction, according to reports to the Board August 16, 1954 and August 15, 1955.

As a result of this action Madison receives as state aid the maximum of $35 per high school pupil and $30 per elementary pupil in average daily attendance per year.

School Bus Transportation

The Board of Education approved the following school bus transportation plan:

** A building permit report is filed after each building permit has been exercised. The custodian in charge and the principal of the building are required to rate the conduct of occupants and the condition of the building after use on five-point scales from excellent to very poor.

For the School Year 1954–55:

East side children from Truax Field, Mendota (grades 7, 8 and 9), Washington Heights, Oak Park Trailer Camp, Superior street, Sherman Terrace to Lapham, Lincoln, Lowell, Mendota, Sherman, East high, 8 buses per day, double shuttle in some instances for serving two areas.

West side children from Findlay Park, University Park, Sunset Village, East Hill Trailer Camp, Orchard Ridge, Blackhawk Park, Mohawk Park, Indian Hills to Dudgeon, Nakoma, Randall, 7 buses per day.

South side children from Waunona Way to Longfellow and West high, 2 buses per day.

Handicapped children, 3 buses, 8 cabs, and 1 limousine per day.

For the School Year 1955–56:

East side children from Truax Field, Mendota (grades 7, 8 and 9), Superior street, Washington Heights, Oak Park Trailer Camp, Sherman Terrace to Lapham, Lincoln, Lowell, Sherman, Mendota, East high, 8 buses per day, double shuttle in some instances for serving two areas.

West side children from Findlay Park, Blackhawk Park, Mohawk Park, Indian Hills, Orchard Ridge, Hill Farm, Hoyt Park to Cherokee Heights, Dudgeon, Nakoma, Randall, 8 buses per day, double shuttle in some instances for serving two areas.

South side children from Waunona Way to Longfellow and West high, 2 buses per day.

Handicapped children, 3 buses, 6 cabs, and 3 limousines per day.

Insurance on School Busses

Glenn W. Stephens, president of the Board, directed that the Checker Taxi company and Badger Bus Lines, Inc., be required to submit a copy of their insurance policies which covered the vehicles used in the transportation of school children to the city attorney for his examination and approval at the meeting September 7, 1954.

The secretary reported at the meeting December 6 that the policies appeared to comply with the Board of Education specifications and Wisconsin statutes, in the opinion of the city attorney.

School Insurance Revisions

Dean Erwin A. Gaumnitz, chairman of the Board's insurance committee, reported at the meeting of August 16, 1954, regarding the revisions in the school insurance program.

He described these revisions of the policy as providing greater coverage for all locations on a blanket basis, the use of replacement cost as the basis of valuation, the elimination of the coinsurance clause with its restrictions, the inclusion of architects' fees in the coverage, and the continued participation in the City Fire Insurance Fund. He stated that these revisions had been obtained at no additional premium cost.

The Board, following a study and report by Dean Gaumnitz, re-affirmed its approval of the insurance program in its meeting on October 18, 1954.

New Elementary Report Card

After several years of study, a committee presented a new tentative report card to the Board at the meeting on October 3, 1955. The Board approved the report card for use in all elementary schools.

Preliminary work on the report card had been done in several schools where parents, teachers, and administrators contributed their ideas. The final task of pooling ideas and reconciling differences was done by a committee of elementary principals.

An effort was made to report to parents the total growth of the child both as an individual and as a member of a group. Since there is usually confusion and inconsistency in the use of traditional marks, an effort was made to find more universally understood terms.

Children are marked in each subject—above-grade level, below-grade level, or at-grade level—according to how they perform with relation to other children. Marks for effort in each subject give further information on the extent to which a child works up to his ability in the different areas. Provision is also made for comments, suggestions for improvements, words of praise, or confidential information.

In order to insure that the report will be treated confidentially by teacher, pupil, and parent, it is sent home in a sealed envelope with another enclosed for its return.

Summer Conservation Course

Paul Olson, teacher of the summer conservation course and principal of Midvale school, reported on the summer project at the meeting March 5, 1956. To illustrate his report he showed movies of the project.

The course is jointly sponsored by the Board of Education and the Wisconsin Conservation Department. The conservation committee of the Dane County Board provided transportation for the boys.

Twenty-six boys took the four-week course in 1955, which included instruction in forestry and game and stream management. They received one semester credit for completion of the work.

The Board authorized the course in conservation for not more than 32 boys for the summer of 1956. The project will be on a tract of land in the Token Creek watershed, which includes 102 farms. The participating boys will do the work on the stream, in the woods, and in game management. The land will be available for development for 5–10 years.

Work-Experience Program

More than 2,534 senior high school pupils worked in more than 650 places of business in the work-experience program of the schools in the 10 year period up to June, 1955, according to a report to the Board by Lloyd Benson, work-experience coordinator. The work-experience program originated in 1942 as a war measure.

On the average, about 130 pupils worked each semester. Their work was checked three times a semester and a written report on each pupil was filed.

Summer Speech Class

At the meeting April 2, 1956, the Board approved a summer training program for children with speech problems in the Washington school. The action was contingent upon agreement by the School of Education at the University of Wisconsin, which rents the building for summer school.

The costs of the program were to be paid by the Board which would be reimbursed by the Bureau for Handicapped Children.

Shelter Markings in the Schools

The director of civil defense for Madison and Dane county requested of the Board of Education August 16, 1954, that shelter markings be placed in all schools. The Board left the matter with power to act in the hands of the superintendent and director of safety. The schools later designated air-raid shelters.

Tuition Pupils

The number of tuition pupils has decreased considerably during the past few years, according to reports to the Board by the secretary.

Annexations have eliminated many elementary tuition pupils. The junior-senior high school tuition group declined considerably with the opening of Monona Grove high school and the retention of grades 7 and 8 at Shorewood Hills school. Following are the totals for the biennium:

Year	Elem. School (Kdg.–8)	High school (9–12)	Specials (Handicapped)	Total
1954–55	131	749	50	930
1955–56	103	528	51	682

Tuitions payable for the school year 1954–55 amounted to $313,269.53. For the school year 1955–56 tuitions payable dropped to $254,814.09, reflecting the declining total of tuition pupils.

Tuition Rates

Following are the tuition rates per week during the past biennium. They were approved by the Board September 7, 1954, and September 9, 1955.

Year	Grades 9–12	1–8	Kindergarten
1953–54	$10.587	$8.63	$4.315
1954–55	10.52	8.87	4.435

Tuition Waived for Foreign Pupils

The Board of Education granted the request of Mrs. John Wrage, representative of the American Field Service, for exemption of tuition during the 1954–55 school year to three foreign pupils, a Japanese boy at West, a Finnish girl at East, and an English girl at Central, September 7, 1954.

Scholarships and Awards

Ramsay Scholarship

At the meeting June 15, 1956, the Board approved the Ray-o-Vac Scholarship plan in honor of the founder, J. B. Ramsay, for a $400.00 scholarship for a Madison area high school graduate for the years 1956–60.

The award will be given to the graduating pupil who has the best record of preparation for University work in engineering, chemistry, physics, and mathematics, and will be continued for four years. Ray-o-Vac will deposit the $1,600 with the University of Wisconsin.

Altrusa Scholarship

The Board approved the Altrusa College Tuition Scholarship May 2, 1955, which gave a girl graduate from Central, East, and West $100 and for the future a $100 scholarship to one girl graduate, alternating with each high school.

Gift for Driver Training

The Madison Insurance Board presented $300.00 in the summer of 1954 and again in the summer of 1955 for use in the summer driver-training program.

Gifts for Pupils

1954–1955	Roundy's Fun Fund		$ 850.00	
	Sight-Saving Class	$ 20.00		
	Deaf Classes	80.00		
	Remedial Classes	300.00		
	Orthopedic Hospital Classes	200.00		
	Child Study and Service	250.00		
	Madison Shrine		200.00	
	Washington Orthopedic	200.00		
	(Made by Shrine as supplement to Roundy's Fun Fund above)			
	Madison Orthopedic School Service Fund		50.00	
				$1,100.00
1955–1956	Roundy's Fun Fund		$1,200.00	
	Sight-Saving Class	$ 25.00		
	Deaf Classes	100.00		
	Remedial Classes	420.00		
	Orthopedic Hospital Classes	250.00		
	Child Study and Service	255.00		
	Strawbridge Players	150.00		
	Madison Shrine		255.00	
	Washington Orthopedic			
	(Made as supplement to Roundy's Fun Fund above by Shrine)			
	Madison Orthopedic School Service Fund		75.00	
	($25.00 earmarked for library)			
	Alpha Gamma Delta alumnae		$ 200.00	
	Pythian Committee for Crippled Children in Wisconsin		250.00	
	(Above $450.00 used to purchase Bell and Howell projector for orthopedic classes)			
	Kiwanis Club		50.00	
	Madison Rotary Foundation		125.00	
				$2,155.00

Teacher Establishes Scholarships

In her will Miss Hazel Duling directed that her estate be used for scholarships for students in three Wisconsin high schools in which she had taught. Each year six youths in Appleton, Berlin, and Madison East high schools receive an award of $100.

In 1955 six East high school boys who planned engineering careers won the awards. Miss Duling requested that one East high school girl, who planned to become a practical nurse, also be given an award that year. In 1956, five boys and one girl, all going into engineering, received the scholarships.

The directors of the fund were three teacher friends of Miss Duling. They made the final selection of youths for the awards.

Plan for New Program for Gifted Pupils

The superintendent reported to the Board February 6, 1956, of a meeting of Madison public school and University representatives to discuss an enriched or accelerated program for gifted high school pupils. This group had recommended that a joint committee, authorized by the Board of Education and the University faculty, be set sup to consider such a program.

The Board approved the appointment of a committee of five to seven members to represent the Board. Those appointed were Arthur H. Mennes, curriculum consultant, Carl H. Waller, director of child study, Earl D. Brown, A. J. Barrett, and R. O. Christoffersen, the three senior high school principals. Dean Erwin A. Gaumnitz and the superintendent are ex officio members.

Following University faculty authorization, President E. B. Fred appointed Lindley J. Stiles, dean of the School of Education, Clyde M. Brown, professor of engineering, S. T. Burns, professor of music, and F. Chandler Young, assistant dean of the School of Letters and Science.

Psychiatric Service

Dean Erwin A. Gaumnitz and Carl H. Waller reported to the Board February 6, 1956, on recent meetings of committees studying juvenile delinquency, child welfare services, and recommendations of the Hunter report.

Mr. Waller stated that there was need for part-time psychiatric service attached to the child study department and available to the schools when emergency situations arise. The Board granted authorization to secure part-time psychiatric service as needed on a diagnostic and consultative basis and allocated funds for such services.

Class Size

During the past biennium the median class load was 29 in Madison public elementary schools and also in the junior-senior high schools, excluding physical education and music classes.

For the school year 1954–55, 86.98 per cent of elementary classes and 68.85 per cent of high school classes ranged in size from 25 to 35 pupils. For the school year 1955–56, 86.70 per cent of elementary classes and 70.59 per cent of high school classes had from 25 to 35 pupils.

PTA Council Publications

Party Code for High School Pupils

Board members received printed copies of the Party Code at the meeting December 6, 1954. Emphasizing that "cooperation is the key to happy family life", the all-city high school services committee of the Madison Council of Parents and Teachers prepared the 10-point party code for use by parents and pupils. The leaflet was printed by the Vocational school.

Parents and Youth—Their Rights and Legal Responsibilities

During the summer of 1956, the high school service committee published a booklet to help parents and youth to have a better understanding of the law. The PTA committee had the cooperation of the Rotary club, the Wisconsin State Journal, and the Democrat Printing company in the project.

Booklet for PTA Convention

Madison schools issued a special booklet, "Capital Schools", for the state PTA convention in this city in April, 1956. Cuts from old reports were used to illustrate the 16-page booklet which also contained general information about the school program, a list of Board members and principals, and a map showing school locations.

French Classes

The Board of Education approved the continuation of the experimental classes in elementary French at Randall school for the 1954–55 school year at the meeting September 7, 1954, and for the 1955–56 school year, October 17, 1955. The classes meet before school in the morning.

Extended Employment in Summer

Seventy-five teachers participated in the extended employment program during the summer of 1954, according to the report of Lawrence Johnson, director, to the Board September 20, 1954.

The work was organized under the general headings of teaching, accounting, child study, curriculum, buildings and grounds, and general work. Teaching included remedial reading, driver education, conservation, music, and art.

Other types of work included research, preparation of reports, compiling and editing summaries and bulletins, furniture refinishing and repair, distribution of supplies, textbook work, and an extensive list of jobs on buildings and grounds.

Time on the job of the workers varied from one week to 10 weeks, the latter for the director who spent extra time organizing and summarizing the work.

During the summer of 1955, 76 teachers were employed under the extended employment program, according to a report to the Board by Larry Johnson, director, October 17. Types of work were similar to those of other summers together with a number of new projects. He showed the Board slides of various projects.

New Teachers

In the fall of 1955 the Madison public schools began the school year with 117 new teachers, a record number. Two of the new teachers were exchange teachers. They were C. Maria Kahn of Sutton Coldfield, Warwickshire, Birmingham, England, and Mrs. Annie Leong of Honolulu, Hawaii.

Special Leaves of Absence

Madison teachers may have leaves of absence to teach in American Dependency Schools in foreign lands with the Board approval March 5, 1956. But the Board will grant no more than three such requests in any one year.

Change in Substitute Teacher Rate

With the beginning of the 1955–56 school year, the substitute-teacher daily rate was increased from $12 per day to $13 per day, by action of the Board August 15, 1955.

Changes in the Teachers' Salary Schedule and COLA

No cost-of-living increase was granted for the period July 1 to December 31, 1954, because a $90 across-the-board basic salary increase had been granted effective January 1, 1954, with that provision.

On January 1, 1955, COLA was frozen at $1,198.20.

President Glenn W. Stephens appointed a Board committee at the meeting December 6, 1954, to meet with representatives of the salary committees of the Madison Education Association and the Madison Federation of Teachers to consider a modification of the teacher salary schedule in line with recent salary adjustments for civil service employees. Members were Mrs. E. J. Samp, Ray F. Sennett, Prof. Erwin A. Gaumnitz, and Mr. Stephens.

At the meeting March 21, 1955, the Board approved the recommendations of the joint committee of the Board and the two teacher groups for the revision of the teachers' salary schedule to include a three-part change in the salary schedule as follows:

1. A $100 across-the-board increment to take effect retroactively to January 1, 1955;

2. Spreading the schedule over a period of 15 years instead of 18 years as previously and having a $200 increment at each step;

3. Longevity service increments to become effective in September, 1955, provided the teacher presents additional evidence of further study, travel, or other professional growth, or unusual service to the Madison school system as follows:

At the beginning of the 18th year of service 2% of the basic salary, 22nd year 4%, 26th year 6%; or

At the teacher's maximum classification beginning the 4th year 2%, 8th year 4%, 12th year 6%.

On January 1, 1956, COLA, which had been frozen at $1,198.20, was adjusted to $120 yearly increase for all except those whose base salary plus COLA prior to the increase exceeded $6,980.20. For the teachers whose salaries were below this figure the new COLA was $1,318.20.

Necrology

Hazel D. Duling, teacher, September 4, 1954
Katherine L. Jones, teacher, September 15, 1954
Mrs. Carrie Styles, food service worker, September 30, 1954
Venice Slagg, teacher, November 30, 1954
Floyd Ferrill, teacher, December 10, 1954
Nell M. Brennan, teacher, September 2, 1955
Marguerite E. Shepard, teacher, May 4, 1956

STATISTICS AND FINANCIAL STATEMENT

ENROLLMENT FOR ALL SCHOOLS

	1954–55		1955–56	
Public Schools				
Elementary school		9,064		9,539
Resident	8,980		9,522	
Non-resident	84		17	
Handicapped		223**		259**
Resident	173		200	
Non-resident	50		59	
Junior–senior high school		5,757		5,814
Resident	4,886		5,240	
Non-resident	871		574	
Total Public School Enrollment		15,044* **		15,612* **
Vocational School (under 18 years of age)				
Resident	163		164	
Non-resident	42		26	
Total Vocational School Enrollment (under 18)		205		190
Parochial Schools				
Elementary school		3,293		3,422
Resident	3,053		3,108	
Non-resident	240		314	
High school		639		672
Resident	543		535	
Non-resident	96		137	
Total Parochial School Enrollment		3,932		4,094
Wisconsin High School				
Resident	214		164	
Non-resident	179		218	
Total Wisconsin High School Enrollment		393		382
Total Enrollment All Schools		19,574**		20,278**

*Does not include part-time parochial or orthopedic hospital pupils (see page 164).
**Does not include pupils enrolled in Trainable Group (severely mentally handicapped); nine in 1955, eight in 1956

SUMMER SESSION ENROLLMENT

	1955	1956
Central High School*	436	439
Instrumental Music	509	586
Summer Band	98	83
Driver Education	458	562
Remedial Reading	129	261
Physical Therapy	----	15

*Administered by the extension division, University of Wisconsin.

COMPARATIVE TOTAL ENROLLMENT—1945–55

SCHOOLS	1945		1950		1954		1955	
	K–6	7–8	K–6	7–8	K–6	7–8	K–6	7–8
Dudgeon	379	---	432	---	549	---	611	---
Emerson	756	---	917	---	843	---	840	---
Franklin	325	70	355	63	350	82	374	71
Lapham	448	31	459	---	615	---	603	---
Lincoln	233	---	384	---	316	---	316	---
Longfellow	406	---	437	---	564	---	541	---
Lowell	665	---	772	---	660	---	710	---
Marquette	783	---	731	---	775	---	743	---
Mendota	------	---	------	---	144	---	340	---
Midvale	------	---	------	---	812	---	934	---
Nakoma	320	77	366	98	576	78	606	---
Randall	705	---	837	---	747	---	741	---
Herbert Schenk	------	---	------	---	433	---	586	---
Sherman	------x	---x	277	---	645	---	546	---
Washington	594	---	609	---	616	---	573	---
Total Elementary	5,614	(178)*	6,576	(161)*	8,645	(160)*	9,064	(71)*
Remedial	110		130		121		129	
Crippled	58		59		56		49	
Deaf	33		36		32		30	
Sight-saving	12		10		17		15	
Total Handicapped	213		235		226***		223***	
Central Junior	573		444		556		561	
East Junior	1,095		1,042		1,219		1,362	
West Junior	827		633		798		955	
Junior high school pupils in elementary schools*	178		161		160		71	
Total Junior High (Grades 7–9)	2,673		2,280		2,733		2,949	
Central Senior	598		576		568		586	
East Senior	1,233		1,246		1,284		1,359	
West Senior	1,055		774		848		863	
Total Senior High (Grades 10–12)	2,886		2,596		2,700		2,808	
Total High School	5,559		4,876		5,433		5,757	
GRAND TOTAL**	11,386		11,687		14,304***		15,044***	

*Junior high school pupils, grades 7–8, enrolled in elementary schools.
**Does not include part-time parochial or orthopedic hospital pupils.
***Does not include pupils enrolled in Trainable Group (severely mentally handicapped); eight in 1954; nine in 1955.
xSherman school annexed to city in November, 1944. Enrollment for 1944–45 294 (grades 1–6—234; grades 7–8—60). Not included on previous reports because of litigation over annexation until September, 1945.

COMPARATIVE TOTAL ENROLLMENT—1946–56

SCHOOLS	1946		1951		1955		1956	
	K–6	7–8	K–6	7–8	K–6	7–8	K–6	7–8
Cherokee Heights	------	---	------	---	------	---	554	200*
Dudgeon	368	---	485	---	611	---	489	---
Emerson	761	---	882	---	840	---	824	---
Franklin	337	73	324	67	374	71	379	75*
Lapham	441	22	489	---	603	---	588	---
Lincoln	250	---	373	---	316	---	326	---
Longfellow	401	---	437	---	541	---	538	---
Lowell	655	---	778	---	710	---	752	---
Marquette	779	---	709	---	743	---	732	---
Mendota	------	---	------	---	340	---	349	---
Midvale	------	---	------	---	934	---	858	---
Nakoma	357	64	418	75	606	---	486	---
Randall	730	---	927	---	741	---	737	---
Herbert Schenk	------	---	------	---	586	---	803	---
Sherman	255	---	331	---	546	---	588	---
Washington	602	---	541	---	573	---	536	---
Total Elementary	5,936	(159)*	6,694	(142)*	9,064	(71)*	9,539	(275)*
Remedial	143		131		129		144****	
Crippled	54		51		49		65	
Deaf	30		40		30		28	
Sight-saving	10		15		15		18	
Braille	------		------		------		4	
Total Handicapped	237		237		223***		*** 259****	
Central Junior	491		448		561		549	
East Junior	1,066		1,103		1,362		1,301	
West Junior	761		656		955		882	
Junior high school pupils in elementary schools*	159		142		71		275	
Total Junior High (Grades 7–9)	2,477		2,349		2,949		3,007	
Central Senior	592		569		586		617	
East Senior	1,263		1,223		1,359		1,244	
West Senior	1,077		797		863		946	
Total Senior High (Grades 10–12)	2,932		2,589		2,808		2,807	
Total High School	5,409		4,938		5,757		5,814	
GRAND TOTAL**	11,582		11,869		15,044***		15,612***	

*Junior high school pupils, grades 7–8, enrolled in elementary schools.
**Does not include part-time parochial or orthopedic hospital pupils.
***Does not include pupils enrolled in Trainable Group (severely mentally handicapped); nine in 1955, eight in 1956.
****Includes 14 East specials.

PART-TIME ENROLLMENT

Year	Parochial* Total Number Pupils	Parochial* Equivalent Full-time Pupils	State Orthopedic Hospital Total Number Pupils	State Orthopedic Hospital Equivalent Full-time Pupils
1947	477	33.72	142	32.02
1948	476	33.47	168	39.64
1949	544	38.67	197	39.11
1950	605	37.14	185	36.77
1951	755	39.66	175	29.46
1952	644	40.88	209	44.90
1953	579	43.50	183	52.30
1954	596	48.10	168	31.20
1955	523	46.50	185	29.10
1956	477	37.60	178	29.90

*Home economics and industrial arts for grades 7 and 8.

CENSUS TOTALS BY SCHOOL DISTRICTS, AGE GROUP 4–19 INCLUSIVE

School Districts	1946	1951	1955	1956
District #8	251	248	207	224
Dudgeon	622	743	803	803
Emerson	1,653	1,825	1,938	1,919
Franklin	779	930	1,030	1,049
Hoyt Park	------	------	------	631
Lapham	1,503	1,440	1,475	1,457
Lincoln	243	250	273	298
Longfellow	1,687	1,478	1,670	1,625
Lowell	1,721	2,044	1,524	1,489
Marquette	2,014	1,752	1,769	1,807
Mendota	------	------	427	691
Midvale	------	------	2,135	1,970
Nakoma	569	811	1,327	1,574
Randall	1,998	2,215	2,867	2,851
Schenk	------	------	1,116	1,477
Sherman	475	817	1,130	1,100
Truax	------	399	444	418
Washington	2,009	1,783	1,700	1,537
Washington Heights	------	------	97	128
Total	15,524	17,888	21,931	23,048

CENSUS TOTALS BY AGE GROUPS

Age	1946	1951	1955	1956
Birth to 3	4,929	7,594	9,163	9,624
Age 4 through 19	15,524	17,888	21,931	23,048
Age 20	1,046	999	940	955
Total	21,499	26,481	32,034	33,627

COMMUNITY USE OF SCHOOL BUILDINGS

	1954–55	1955–56
Community and Civic Groups		
Airco Association	1	1
Audubon Society	5	5
Augustana College Choir	-----	2
Barbershop Quartets	3	6
B'Nai B'Rith	4	-----
Candidates and Voters Meeting	1	5
Cherokee Garden Club	-----	1
Civic Orchestra	-----	13
Dane County Humane Society	1	-----
Drum and Bugle Corps	5	5
Elections and Election Activities	65	33
Harmony Holiday	1	-----
K. Hubbard Dance Recital	4	5
India Student Association	-----	1
Izaak Walton League	1	-----
League of Women Voters	-----	2
Legion Convention	20	-----
Madison Business College	-----	2
Madison String Sinfonia	1	-----
Madison Veterans' Council Benefit	-----	2
Memorial Day Activities	-----	1
Midvale Heights Community Association	2	3
Midwest Singers	2	-----
Military Information Meeting	-----	1
Nakoma Welfare League	2	4
National Sales Executive Club	2	-----
Nineteenth Ward Meeting	1	-----
One-Way Street Meeting	1	-----
Orchard Ridge Square Dance	9	-----
Park Dept. Life Guard Association	-----	3
Philharmonic Chorus	2	5
Public Health	5	51
Ray-O-Vac Employees	3	1
Red Cross First Aid	-----	10
Red Feather and United Givers	1	2
Sewerage Diversion	1	-----
Shrine Christmas Party	2	2
Sunset Village Club	2	2
SPEBSQSA	-----	2
Vocational Nurses Graduation	-----	1
Westmorland Community Association	2	1
Wirth Court Mothers Club	1	-----
Wisconsin Knights Templar	1	-----
Total	151	173
Teacher Organizations	21	19
Adult School-Related Organizations (such as the PTA)	445	294
School Activities	261	243
School Athletic Program	376	351
Youth Activity Organizations (such as Boy Scouts)	341	349
Special Classes (such as Driver Education)	811	912
Recreation Program	1,571	1,248
Grand Total	3,977	3,696

*This list shows the groups which used the buildings and the number of times the schools were used, but with no reference to the number of rooms used or the number of hours used in each case.

FINANCIAL STATEMENT — BALANCE SHEET AS OF JUNE 30

ASSETS

	1955	1956
FIXED ASSETS		
Land and Land Improvements	$ 1,207,941.25	$ 1,247,287.17
Buildings and Attached Structures	8,365,551.26	8,430,028.14
Machinery and Equipment	1,085,698.54	1,129,136.32
CURRENT ASSETS		
Cash in Bank	88,072.08	143,427.70
Board of Education—Petty Cash Fund	50.00	50.00
SUNDRY ACCOUNTS RECEIVABLE		
Accounts Receivable—General	20,545.39	19,728.62
Tuitions Receivable	95,581.71	84,923.10
INVENTORIES		
Stock Room	24,804.45	38,695.12
Fuel	16,474.88	19,038.13
TRUST FUNDS		
Samuel Shaw Prize Fund	936.30	938.80
C. R. Stein Scholarship Fund	2,420.37	2,425.37
William McPyncheon Trust Fund	9,914.92	9,885.78
Theodore Herfurth Scholarship Fund	5,991.25	6,020.00
Industrial Players' Injury Benefit Fund	33.94	337.33
Ralph B. Jones Memorial Fund	557.95	562.21
Allan J. Shafer Jr. Memorial Fund	1,424.05	1,449.05
Genevieve Gorst Herfurth Speech Fund	2,000.00	2,000.00
Helen Davis Faculty Memorial Fund	637.50	1,003.00
Gisholt Scholarship Awards	250.00	300.00
	$10,928,885.84	$11,137,235.84

LIABILITIES

	1955	1956
FIXED LIABILITIES		
Bonded Indebtedness	$ 4,138,500.00	$ 5,086,500.00
State Trust Fund Loans	58,822.00	51,612.00
OTHER LIABILITIES		
Award of Industrial Commission to Jess Lyon	5,833.20	3,909.24
RESERVES—PETTY CASH		
Music Department	2,885.61	4,847.10
Crippled Children's Fund	200.00	200.00
Braille Class Fund	------------	145.00
TRUST FUND RESERVES		
Samuel Shaw Prize Fund	936.30	938.80
C. R. Stein Scholarship Fund	2,420.37	2,425.37
William McPyncheon Trust Fund	9,914.92	9,885.78
Theodore Herfurth Scholarship Fund	5,991.25	6,020.00
Industrial Players' Injury Benefit Fund	33.94	337.33
Ralph B. Jones Memorial Fund	557.95	562.21
Allan J. Shafer Jr. Memorial Fund	1,424.05	1,449.05
Genevieve Gorst Herfurth Speech Fund	2,000.00	2,000.00
Helen Davis Faculty Memorial Fund	637.50	1,003.00
Gisholt Scholarship Awards	250.00	300.00

PROPRIETARY INTEREST

FIXED SURPLUS	6,456,035.85	5,664,430.39
CURRENT SURPLUS	242,442.90	300,670.57
	$10,928,885.84	$11,137,235.84

REVENUES

REVENUE RECEIPTS AND ACCRUALS

July 1, 1954 Through June 30, 1956

Particulars	1955	1956
STATE FUND APPORTIONMENT		
In City of Madison	$ 273,211.07	$ 278,062.40
TAXES LEVIED BY COUNTY SUPERVISORS		
In City of Madison	121,100.00	128,450.00
CITY SCHOOL TAXES		
In City of Madison—General Fund	3,422,876.99	4,016,336.26
In City of Madison—Recreational Department	164,479.39	170,647.72
In Joint School Districts 6, 8 and 9	29,003.25	53,878.12
STATE AIDS		
For Deaf School	22,607.13	26,114.32
For Special Schools	32,978.73	39,010.60
For Speech Correction	16,319.59	22,596.53
For Crippled Children—Washington School	44,962.34	35,583.93
For Crippled Children—Orthopedic Hospital	13,089.85	14,965.00
For Crippled Children—Other Schools	399.50	264.00
For High Schools	126,447.29	123,355.00
For Sight Saving	4,858.81	6,974.33
For Transportation—Elementary	16,488.00	20,252.00
FEDERAL AID		
In City of Madison	88,596.84	40,456.18
TUITIONS		
Central Senior High School	12,286.98	15,771.46
Central Junior High School	6,217.79	7,762.03
East Senior High School	125,303.08	108,281.99
East Junior High School	63,500.56	50,086.64
West Senior High School	69,661.12	60,368.59
West Junior High School	40,736.13	27,202.68
Elementary Schools	46,879.88	20,072.25
Deaf School	4,826.95	10,107.37
Crippled Children	10,970.09	5,947.35
Sight Saving	1,336.76	2,953.83
Exceptional	605.14	534.83
RENTALS		
C.H.S. Auditorium and Gymnasium	556.82	264.57
E.H.S. Auditorium and Gymnasium	477.27	283.73
W.H.S. Auditorium and Gymnasium	917.00	918.98
Elementary Gymnasiums	597.37	102.00
OTHER RECEIPTS		
Board of Education	2,108.67	1,005.84
Recreational Department	14,055.97	11,324.17
CLEARING ACCOUNTS		
For Social Security and Employee Retirement	104.77	146.21 (Red)
For Withholding Tax	32.26	4,349.51 (Red)
	$4,778,593.39	$5,295,438.98

SUMMARY OF EXPENDITURES

TOTAL OPERATION, MAINTENANCE, AND CAPITAL

July 1, 1954 Through June 30, 1955

	Operation	Maintenance	Capital	Total
Administration Building	$ 128,315.15	$ 3,569.22	$ 2,735.93	$ 134,620.30
Central Senior High School	240,366.00	46,081.72	17,985.37	304,433.09
Central Junior High School	157,411.45	2,263.70	198.31	159,873.46
East Senior High School	426,217.44	81,258.76	12,771.62	520,247.82
East Junior High School	274,843.84	665.30	422.97	275,932.11
West Senior High School	306,905.04	46,890.58	10,600.80	364,396.42
West Junior High School	210,017.14	958.63	579.48	211,555.25
Mendota School	55,964.06	1,300.21	4,707.61	61,971.88
Dudgeon School	119,564.87	4,846.94	5,603.77	130,015.58
Emerson School	174,982.21	11,665.44	6,257.12	192,904.77
Franklin School	117,609.58	5,073.59	4,044.60	126,727.77
Schenk School	107,982.27	1,203.49	6,824.23	116,009.99
Cherokee Heights School	616.02	----------	----------	616.02
Lapham School	138,677.64	3,996.90	2,271.24	144,945.78
Lincoln School	69,518.43	7,878.16	3,743.14	81,139.73
Longfellow School	122,456.16	4,676.25	5,082.38	132,214.79
Lowell School	160,765.18	12,217.73	2,893.79	175,876.70
Marquette School	161,011.81	1,990.82	118.04	163,120.67
Nakoma School	124,951.79	7,475.55	3,765.56	136,192.90
Randall School	158,641.60	17,066.42	5,096.82	180,804.84
Washington School	146,190.70	2,923.10	3,177.15	152,290.95
Sherman School	126,428.87	3,672.79	3,912.33	134,013.99
Midvale School	169,954.92	1,832.33	6,908.58	178,695.83
Recreation Department	173,626.63	2,700.95	901.20	177,228.78
Rethke Property School Site	------------	----------	561.70	561.70
Undistributed*	553,077.20	4,262.20	1,234.73	558,574.13
	$4,426,096.00	$276,470.78	$112,398.47	$4,814,965.25

*Includes: curriculum; guidance; special education classes such as deaf, remedial, orthopedic, sight-saving, braille, and nutrition; supplies for art, physical education, home economics, manual arts, and music in the elementary schools; transportation and trucks; and liability insurance.

SUMMARY OF EXPENDITURES

TOTAL OPERATION, MAINTENANCE, AND CAPITAL

July 1, 1955 Through June 30, 1956

	Operation	Maintenance	Capital	Total
Administration Building	$ 138,581.91	$ 3,247.54	$ 9,546.91	$ 151,376.36
Central Senior High School	260,814.48	51,071.55	4,804.82	316,690.85
Central Junior High School	154,465.51	1,564.35	647.36	156,677.22
East Senior High School	439,313.12	49,644.01	32,049.61	521,006.74
East Junior High School	296,067.52	559.29	1,890.68	298,517.49
West Senior High School	326,074.75	39,671.98	13,906.56	379,653.29
West Junior High School	199,074.31	911.88	728.09	200,714.28
Mendota School	56,126.58	884.55	599.13	57,610.26
Dudgeon School	120,776.58	4,704.73	4,823.23	130,304.54
Emerson School	176,150.30	14,621.22	5,923.86	196,695.38
Franklin School	130,929.06	14,036.82	3,068.87	148,034.75
Schenk School	151,435.59	882.66	4,523.46	156,841.71
Cherokee Heights School	167,719.61	1,127.19	12,677.53	181,524.33
Lapham School	145,251.66	3,080.86	1,963.35	150,295.87
Lincoln School	82,468.52	7,754.69	3,519.69	93,742.90
Longfellow School	122,120.90	6,977.59	4,767.49	133,865.98
Lowell School	166,332.57	14,922.66	5,608.68	186,863.91
Marquette School	162,158.63	7,422.78	2,098.47	171,679.88
Nakoma School	113,703.51	10,316.54	7,349.59	131,369.64
Randall School	165,808.12	14,480.29	6,199.65	186,488.06
Washington School	147,493.74	14,215.11	3,421.04	165,129.89
Sherman School	131,653.07	5,314.94	3,318.24	140,286.25
Midvale School	179,445.86	1,216.51	12,713.37	193,375.74
Hoyt Park School	1,327.65 a.	----------	----------	1,327.65 a.
Recreation Department	179,635.62	1,215.73	----------	180,851.35
Undistributed	601,905.18*	3,449.88	1,110.90	606,465.96
	$4,814,179.05	$273,295.35	$147,260.58	$5,234,734.98

*Includes: curriculum; guidance; special education classes such as deaf, remedial, orthopedic, sight-saving, braille and nutrition; supplies for art, physical education, home economics, manual arts, and music in the elementary schools; transportation and trucks; liability insurance.

a. Credit

GRADUATES FROM MADISON HIGH SCHOOLS

(Including February)

Year	Central	East	West	Total
1947	197	392	315	904
1948	203	405	360	968
1949	157	340	301	798
1950	179	356	250	785
1951	167	361	250	778
1952	129	346	244	719
1953	153	319	260	732
1954	145	348	268	761
1955	136	341	282	759
1956	172	406	290	868

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