How a Boy should Train to Become a Champion

By Lawson Robertson

Track and Field Coach, University of Pennsylvania
Head Coach American Olympic Teams 1924, 1928, 1932, 1936

Between the champion athlete and the dub athlete there is
but a bubble of difference. Yet that slight difference is the
key to victory.

How can the "dub" close this slight gap? By faithful attention
to the details of his sport—by everlastingly keeping at the job of
improving his methods until they approach perfection.

There is a lot in getting started right. In my twenty years of
coaching track and field athletics at the University of Pennsylvania
I have seen many of my students to take part in competitive sports until they have been
proved sound by a doctor's examination. Most students to take part in competitive sports until they have been
proved sound by a doctor's examination. Therefore it is imperative that the young athlete, even though he is
an athlete of championship class—is that he try hard to learn
the right way of doing things—what we call good form—in the
very beginning. Then he won't have things to unlearn. Unlearn-
ing always is harder than learning.

You Don't Have to be a "Natural Athlete"

There seems to be a pretty general opinion among most people
that championship athletes are born and not made. I have had occasion
in the past few years to study the life histories of some of the world's greatest athletes, and
I want to tell you, boys, that it has not been their natural qualities or their natural physical development that has made all
the best athletes into champions, nearly so much as one essential, which, in my opinion, is the most important characteristic of the
great athlete. That one characteristic is the ability—natural or
cultivated—of keeping everlastingly at it. The boy of average nat-
ural ability who has this sort of determination is much more likely
to develop into a champion than is the "born athlete" who lacks
the all-important quality of stick-to-itiveness. Cultivate the never-
say-die spirit! If you do—even though you do not become a cham-

one athlete in the end—you will be well repaid, for in the process
you are building character, and developing a task that will be helpful
to you when you go out into the world to do other and bigger things.

Don't Get "The Big Head"

If you have gone into athletics determined to win success, and
are beginning to show results that make you pretty well satisfied
with your work, don't let your success turn your head. As they say
in sport, don't get the big head. You will derive yourself of many of
the best things in life if you fail to win the friendship of your
associates. Don't make them despise you by boasting. Let the results
of the best things in life if you fail to win the friendship of your
associates. Don't make them despise you by boasting. Let the results
of your athletic ability. The scholastic requirements of today are so
high that no athlete can afford to neglect his studies. Therefore you
should make up your mind to make a good record for yourself in
the classroom as well as on the athletic field. Remember always that there are two parts to an education—the part you get inside
the class-room and the part you get outside from your association
with your athletic friends. They both are important, and you
should not neglect one at the expense of the other. Too few athletes
realize that they will not be permitted to compete unless they are
up to the standard in their studies. Don't forget that many star
school athletes fail to pass their college entrance examinations
because they have paid too much attention to athletics and not
even to their studies.

Physical Requirements

There really are no standard physical requirements for athletes.
In running and baseball—even in football and weight throwing—
small men have competed successfully against giants. However,
there is no doubt that in football, weight throwing, and some other
sports, the good big man usually will beat the good little man. Con-
centrate on the sport in which you will have the best chance of
success. Having chosen your sport, do not be discouraged if you
have a physical handicap. Proper training will overcome it. The
main thing that I want to impress upon you is that physical attain-
ments are relatively unimportant. It is spirit that counts most.
Determination to succeed will enable you to overcome any handicap.
You sometimes hear people talk about athletes losing young
men. These isolated cases are the result of boys starting strenuous
training without the precaution of taking a physical examination.
Therefore it is imperative that the young athlete, even though he is
apparently sound, should avail himself of this precaution. Most
physical defects can be remedied easily. Discover and correct them
before you enter college, for most colleges do not allow their
students to take part in competitive sports until they have been
proved sound by a doctor's examination.

At What Age Should a Boy Start Athletics?

I often am asked at what age a boy should start his athletic
career. It is perfectly safe for a boy to start easy training as soon as
he becomes interested in sport, but, at whatever age he starts, he
should be careful not to overtax himself. He should work up grad-
ually. Never let anyone put you to a task which is beyond your
power to accomplish, or that taxes you too severely in the early
years of your life. Start early if you want to, but go about your
training systematically. It is unfortunate that young boys in prepar-
atory schools are permitted to compete frequently in too-strenuous
competition before they have attained their full physical develop-
ment. The young athlete should conserve his strength, so that when
he enters college—when it is most important that he should be at
his best—he will have a big reserve of energy to do bigger things,
and perhaps realize his ambition of becoming a champion. There
are many glorious examples of boys who have burned themselves
out in high school and preparatory school competition.

Proper Training

Eat plain, wholesome food, avoiding fried and greasy dishes
and heavy patrons. Training is regularly list, at the same times,
and exercise at the same time each day. Sleep nine hours every night
in a well-ventilated room. A short daily bath after exercise is a
necessity. If possible, take a half-mile walk before breakfast. Smok-
ing is, of course, out of the question.

The fact is that while a champion athlete is worth while, for
even if you do not succeed, remember that in the dust of defeat as
well as in the laurels of victory, glory is to be found.
The Great Forward Movement of Chemical Industry

Unlimited Opportunities and Astounding Miracles Await the Achievements of Future Chemists.

Results and accomplishments that have startled the world—discoveries that have contributed to the happiness and welfare of people and to the wealth and strength of nations, has been the reward of chemical research.

In times of stress, whether in peace or war, chemical industry has done its part with outstanding success, and out of the chemists' test tubes will come future re-actions that will revolutionize industry and see developments in chemistry that are likely to change our whole method of living.

New foods from barks and shrubs, now considered worthless, new medicines and drugs that will banish deadly diseases, new metals, fuels, fabrics, colors, perfumes, new uses for coal tar products, developments in production of liquid fuels, the manufacture of synthetic products, reclamation of waste piles and scrap heaps, are all problems that great industries will be constantly calling upon the chemist to solve.

In presenting this introduction the reader will no doubt be interested in an ancient tales from the new Gilbert Chemistry Manual, edited by Prof. Trest B. Johnson, Yale University, Ph.D. 1938, Ph.D. 1931 pertaining to the origin of the word Chemistry, Chemistry as a Science, The Chemist's Laboratory and Use of Equipment.

Origin of the Word Chemistry

The first literary work in which the word—"Chemistry"—is found was written by Plutarch, a Roman historian who lived from 46-220 A.D. In a treatise entitled—"Ais and Osiris"—that philosopher mentions that "Egypt" in the dialect of the country, was called the same name as the black of the eye, "Chemis," and from this he infers that the word meant "Black" in the Egyptian language. Some science historians believe that our word "Chemistry" means "The Egyptian Art." Others think that the word was coined to mean "The black art," Still others think that the word meant "The dark or hidden art." Another school of thinkers believes that the word has no connection with Egypt at all, but that it comes from the Hebrew word "Chemets," meaning mystery. Another possible derivation, according to some historians, is from the Arabic word "Chemia," meaning to hide, hence "the Hidden Science." In fact, a book of secrets was written in the time of the ancient Egyptians called "Kein." Probably no one will ever know definitely which one of these possible derivations is the correct one.

Origin of Chemistry as a Science

According to some historians, the origin of chemistry as a science dates back to the time of Tubal Cain, the father of workers in metal. Cain is also given to Hermes, the Egyptian god of art and sciences. His son is said to have colonized Egypt, which was foremost in the knowledge of chemistry in those ancient days for they had developed the arts of making glass, pottery, colors, embalming fluids and other practical products to a high degree, and the early Egyptians can really be said, therefore, to have had an advanced knowledge of applied chemistry. Then Paracelsus, the Greek physician, carried the study along and discovered the influence of chemistry upon medicine in the treatment of human ills, and it was through him that the action of several inorganic salts upon the human system became known. Following this period a long time elapsed, hundreds of years, during which time chemistry was empirically made by unknown workers in science, but which really had little influence upon the development of modern Chemistry.

Chemistry, as we know it today, is one of the newest of our sciences, and yet it is one which offers the greatest opportunities of advancement, research and fame for those today who are interested in the fuller things of life. Centuries ago there was no such thing as chemistry. Chemistry was preceded by alchemy. Alchemists were superstitious men and very often dishonest. He was a group of mystics, and if it had not been for this interest in the mysteries of energy and matter, modern chemistry would never have been born. We can now visualize the old alchemist working over his pots and retorts in crude laboratories and in dark caves. Shrouded in mystery, and his activities kept secret, his imagination fired with zeal and exercising patience, and with the purpose of a religious fanatic, he sought to make or find the philosopher's stone.

It was not until the early part of the eighteenth century that the scientists of the central European countries and the English Empire began to contribute fundamental knowledge which laid the foundation and paved the way for the development of this wonderful science. The Frenchman, Lavoisier (1743-94) may really be credited with being the father of modern chemistry.

There is hardly a science today that has greater economic influence, or holds more fascinating interest to scientists throughout the world than chemistry. If we are to understand and correctly interpret these hidden things of nature that most of us think are magical and mysterious, like a knowledge of chemistry, no large and progressive manufacturing industry can cope with its competitors today without a trained chemist to advise and assist in its development and the analysis of new materials which it buys.

The present-day physician without a knowledge of chemistry would be incompetent and unable to maintain an acceptable professional standing as a practitioner of medicine.

The great problems involved in the manufacture of synthetic drugs, dyes, perfumes, essential oils, of soil fertilization, and of the many substituted and artificial productions influencing modern civilization are every-day problems of chemistry. The regulation of our food supply calls for the efforts of thousands of experienced technicians who are employed as chemists in industry, municipalities and both our State and National governments. If we would have our country today improve its standards of living and at the same time accommodate itself to an increasing population, we must hereafter maintain on an even more liberal scale than ever before great laboratories of science devoted to the study of chemistry. The men and women working in these laboratories are among our priceless possessions. There is no sum that the world could not afford to pay these men who have that originality of mind and devotion and industry to carry forward in scientific advancement until its influence spreads to the comfort of every home. It was former President Coolidge who wrote as follows: "Wherever we look, the work of the chemist has raised the level of our civilization, and has increased the productive capacity of the nation."

Probably most boys are interested in science because they just naturally think they will like science. This is a perfectly good and natural thought. Many boys and girls are interested in science because they just naturally think they will like science. This is a perfectly good and natural thought. Probably most boys are interested in science because they just naturally think they will like science. This is a perfectly good and natural thought. Probably most boys are interested in science because they just naturally think they will like science. This is a perfectly good and natural thought. Probably most boys are interested in science because they just naturally think they will like science. This is a perfectly good and natural thought.
relationship between chemistry and its application to our chemical industries and to everyday life and to the beginner we advise the use of a Gilbert Chemistry Set for reasons of its completeness in equipment and the basic knowledge contained in the instruction books. There was a time when chemistry was regarded as beastly and sorcery. Chemicals were formerly looked upon as deadly poisons and chemical reactions were associated with explosions. The men who practiced the science of chemistry had to do it in secret because they were regarded by the people with superstition and dread and as related to the devil.

Today conditions are entirely different. There is now no need for secrecy. A chemist is looked upon today as a professional man to be treated with respect, and there is a growing desire to know more about this science. To satisfy, in some degree, the youthful thirst for chemical knowledge, and to afford the pleasure to boys to be derived from the intelligent performance of simple experiments, is one of the aims presented in Gilbert Manuals. The second aim is to develop the power of scientific reasoning and to give to the boy an elementary knowledge of the fundamental principles upon which modern chemistry is based.

Prof. Johnson advises that all experiments should be carried out with accuracy in order to obtain satisfactory results. Remember that nature is exciting in her methods of operation, and it is the problem of the scientist to seek the truth and operate according to the "rules of the game," so to speak, by careful experimentation. He further urges that you think for yourself, when you are performing experiments, first as to what you are doing the experiment for, second, weigh carefully the results obtained, and thirdly, draw some conclusions as to what the results really mean to you. It is by so doing that you will develop your imagination, and an investigative mind. The performance of your experiments will prove a pleasure to you, and at the same time you will contribute to your knowledge and also advance and develop the science of chemistry.

The Chemist's Laboratory

The chemist's workshop or laboratory has several special requirements if it is to be fully satisfactory. A room somewhat isolated to avoid interruption is desirable. Good ventilation is necessary, and at least enough heat at all times to keep water solutions from freezing. While a capable chemist seldom spills anything, even in spite of popular opinion, almost never has an explosion, it is better to have the laboratory plainly and simply furnished so that an accidental splash will do no damage. A plain wooden floor is better than a carpet, and concrete or linoleum are still better. The work table may be of plain lumber, with the top waxed frequently to protect it. A sink and a supply of running water are quite essential, but if he lacks these the ingenious boy chemist will find a way to provide himself with running water from a pail fitted with a siphon and hose. And you never will get too many shelves, cabinets and drawers for storage.

Now in picturing to you this ideal laboratory, we realize that few boys can have all this at once. In fact, a Gilbert Chemistry Set has been designed to be as far as possible a complete laboratory in itself. Boys can have all this at once. In fact, a Gilbert Chemistry Set has been designed to be as far as possible a complete laboratory in itself. But we feel sure you will enjoy it more if you can at least select for yourself a work table, drawers for storage, and a sink with a supply of running water. Your laboratory must be set up in a secluded corner in den or kitchen, or even in the woodshed, cellar, or attic, where your apparatus may be left set up undisturbed.

The Equipment and Its Use

Good technique can only be acquired by careful self-training. Learn what use each piece of apparatus is intended for, and the best ways boys can have all this at once. In fact, a Gilbert Chemistry Set has been designed to be as far as possible a complete laboratory in itself. But we feel sure you will enjoy it more if you can at least select for yourself a work table, drawers for storage, and a sink with a supply of running water. Your laboratory must be set up in a secluded corner in den or kitchen, or even in the woodshed, cellar, or attic, where your apparatus may be left set up undisturbed, and there will be room to expand as you build or buy new equipment and supplies.

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Winning a World's Championship

A Thrill of Thrills to the Athlete

It is only a few short years since A. C. Gilbert was crowned a world's champion. He won this distinguished honor in the pole vaulting event at London in the 1908 Olympic classic when he was a boy and in competition with the world's greatest athlete he soared to record heights and was acclaimed champion of champions.

Since those days when he was one of Yale's outstanding brilliant athletes his interest in athletics has never lessened and as a member of the Yale Track Advisory Committee he has done much in the development of other Yale stars who have brought records and glory and even world's Olympic Championships in his Alma Mater.

Mr. Gilbert has long been prominent as a member of the American Olympic Committee and it was on his return from Berlin, Germany where he witnessed the 1906 World's Classic that he received his most valued possession, a gold medal made into a watch fob, "Queen Alexandra presented it to me; it's one of my most valued possessions and winning a world's championship is certainly a thrill of thrills to the athlete."
Three Pennsylvania Boys Win Big Gilbert Chemistry Award

Many Other Young Chemists Rewarded for Their Interesting and Practical Experiments

Dean I. Walter and Messrs. Ralph and Roland Diehl, Capture $100.00 Prize in Nationwide Contest

An unusual and somewhat perplexing situation confronted the judges of the 1936 Gilbert Chemistry Contest when prizes were awarded. In fact, it was an interesting and unusual, for in the final judgment, it was noted that the big award was in favor of Walter and Diehl Laboratory of Hollidaysburg, Pa. What's going on, we are given prizes to boys, not business houses," shouted one of the judges, but it just happens that this business house, while it may not be a competition at this early date, is conducted by three youngsters who have an eye to the future and are actually operating on a paying basis right now.

Yes sir, the company is $100 richer today than it was before the contest started, and according to young Mr. Walter, who is manager, part of this winning is going right into the business for additional equipment and the rest will be equally divided between the three partners.

This is indeed an unusual circumstance, and decidedly different than any we have had to deal with before, and to have three young boys actually operating their own little plant is ample proof of their determination to succeed.

They have a well equipped laboratory and do electrical and mechanical work, picture developing and chemistry research. They do all their printing with their own press and rely effects obtained through blue, aluminum and organic compounds. They have a well equipped laboratory and do electrical and mechanical work, picture developing and chemistry research. They do all their printing with their own press and rely effects obtained through blue, aluminum and organic compounds. They have a well equipped laboratory and do electrical and mechanical work, picture developing and chemistry research. They do all their printing with their own press and rely effects obtained through blue, aluminum and organic compounds.

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Ohio Boy Has Novel Weather Forecaster

Ralph Koehn of Akron, Ohio, and a student in the Garfield High School has created a weather indicator which is extremely novel and interesting.

Apparatus--A glass bottle, burner, hydrochloric acid and copper strips.

Procedure--Dissolve the copper strips as quick in action, is obtained by dissolving three measures of sodium ferrocyanide in two test tubes full of hydrochloric acid and shaking vigorously before using. The advantage of this chemical is its strong attraction for water and it turns blue in the presence of water. It is a very interesting experiment and not without value.

Ultra Violet Light Produces Fluorescence

Marshall Albert of New Haven, Conn., is deeply interested in Chemistry and for a boy his age is well versed on the subject. Marshall, who is 14 years of age, and a junior at Hillhouse High School, recently gave a very interesting presentation at the factory with his Argon Glow Lamp and cleverly demonstrated fluorescence in minerals.
Moreover Marshall proved that fluorescence, which is that property that some bodies have of emitting light while exposed to the action of certain rays, is not confined to minerals alone for he divides fluorescent materials into four groups as follows: (1) chemical compounds and solutions or mixtures, (2) minerals, (3) solutions found about the home, and (4) miscellaneous objects.

He showed how numerous materials react to the ultra-violet rays and demonstrated color changes under the incandescent light and the Argon Glow Lamp.

There are many miscellaneous things which showed fluorescence under the lamp. The ornaments and hands of a "radiotite" wrist watch were especially interesting because the "radiotite" coated portions not only glowed a very bright green under the ultra-violet lamp, but continued to glow very brightly for several minutes after the lamp was turned off.

Then again a solution which had been prepared by allowing a parsnip root, cut into sections, to rot in water, though somewhat colorless and slightly murky in ordinary light, turned light blue under the ultra-violet rays.

"Three-in-One" lubricating oil fluoresced bright blue, while some transparent yellow glass "agates" became a very bright green under the lamp.

One of the most interesting of minerals was a specimen of zinc ore that had frankllinite scattered through a non-fluorescent matrix. Under the lamp, the spots of frankllinite glowed a bright green while the matrix was a dark purple, because of its reflecting some of the visible light of the glow lamp. The result reminded one of fireflies at night.

The demonstration proved that the property of fluorescence is a helpful aid in the analysis of different substances and that the ultra-violet ray is of value in chemical experimentation.

Oklahoma Boy Does Things with Blueing

Bob Rorschach of Tulsa, Oklahoma, diluted one teaspoon full of Mrs. Stewart's concentrated liquid blueing; about 5 to 10 added sodium hydroxide, stirring the mixture until the blue color disappeared and a brown precipitate formed. Precipitate was next filtered into a test tube, washed several times with hot water and allowed to go into the filtrate. He then passed hydrochloric acid over the precipitate and let it filter into the filtrate. As the first drop of acid touched the filtrate, a blue tinge came into the liquid, and as more acid was used, layers of white and blue were formed.

Texas Boy Wins

Hughes Powell, a student in the Texas Senior High School of Texarkana, Texas, presented numerous chemistry experiments all of which were very interesting, and his experiment—"Creation of Artificial Life"—was of exceptional merit.

Hughes Powell is a member of the local chapter of the Texas Junior Academy of Science.

Another Texas Winner

Fleming Giddings of Wesco, Texas, submitted a very interesting experiment on the Synthesis of Water, by Weight. This netted Fleming one of the $10.00 prizes.

Other $10.00 Prize Winners

NELSON DERSTINE ...........................................Hatfield, Pa.
HAROLD KULP ................................................Hatfield, Pa.
H. DECHAMBRE ................................................Paris, France
LUCIEN F. KULSKI ............................................Hattfield, Pa.
MISS JUNE BOWERS .........................................Pittsburgh, Pa.

"Do You Know?" Answers

QUESTION—How to test a rabbit for fever

Answer—Insert a needle and work it out with your fingers. The rabbit's temperature will cause a blue line to appear on the skin. The rabbit is then killed and the blood is taken out. If the blood is blue, then it is not fevered.

QUESTION—What chemical make wood fingerprint?

Answer—Wood is composed of a variety of materials, such as starch, cellulose, and lignin. The fingerprint is made by applying a chemical reagent to the wood, which reacts with the starch or cellulose. The fingerprint is then developed by applying a second chemical reagent.

QUESTION—How to test yourself for "cold sweat"?

Answer—Make a small piece of blue filter paper with the type and add it to the paper towel. If the paper towel is white, add acid is usually required, by an aged temper or by delayed death. Normally the acid should be either a strong or an only slightly dilute.

QUESTION—What is "valueless reversionary"?

Answer—One of the most helpful and striking demonstrations for laboratory or home work is that of aahorlurein or hoflurein in liquid light. Certain chemical reactions, usually called the "reversionary" or "reversionary" reversionary, result in the development of light with a visible yellow light. Such a light is usually associated with the discovery of something important.

This phenomenon is very interesting because it has long been known, but has not yet been explained scientifically. The phenomenon is called the "reversionary" reversionary, and it is usually associated with the discovery of something important.

The demonstration requires the solution of a single, simple equation. The demonstration requires the solution of a single, simple equation.

Small nails or laboratory experiments, the fluid phosphor is most satisfactory. A clear glass or laboratory experiments may be used, and the fluid phosphor is used in the same way as water. A clear glass or laboratory experiments may be used, and the fluid phosphor is used in the same way as water.

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Inventor of Erector tells how to become member of Gilbert Engineering Institute

The highest award an American soldier can receive is a Congressional Medal of Honor. The highest award a civilian can receive for saving another's life is a Carnegie Medal.

Likewise, the highest honor a boy engineer can win is membership in the Gilbert Engineering Institute for Boys. Founded by Mr. A. C. Gilbert, the inventor of Erector, the Institute is maintained for the purpose of encouraging and recognizing original achievements in Erector engineering. Upon election to the Institute, each new member is awarded a handsome "Diploma of Merit" bearing his name.

What To Do To Join

If you have an Erector Set, or if you are getting one for Christmas, you doubtless will want to join this illustrious group of boy engineers. Naturally, the first question is what to do to become eligible. There's no better man to tell you than Mr. Gilbert himself. Here's his advice:

"The important thing to bear in mind is that membership is strictly on a merit basis. The only "pull" that is recognized is your own pull of ambition. Now let's see just what that means."

"When you first start building Erector models, the chances are you build those illustrated in the instruction manual. The lifting beam engine, drawbridges, dump truck, airplane beacon, etc. "Later when you have gained experience in Erector engineering, you will begin to think of new and original models of your own—a piece of machinery, mechanical device, engineering project, etc. Perhaps you will get your ideas from an illustration you've seen in a book or magazine, from a trip you've taken or a visit to some factory.

"Whatever your new model is, when you've finished it, just make a sketch or photograph and mail it to me. If it is approved by the Institute's Board of Directors you will then be elected to membership and receive your Diploma of Merit inscribed with your name. "In addition, if your original model has exceptional merit, you will be given a cash award of from $5.00 to $10.00."

"Does all this sound hard? Certainly not to red-blooded boys. Building original models is the most interesting and thrilling thing you can do in Erector Engineering. Why not decide right now that you are going to win an Institute Diploma during the coming year?"

A FEW PRIZE WINNING MODELS

BY

GILBERT

BOY ENGINEERS

MINIATURE OBSERVATORY

with Dome Removed

THOMAS TALLOTT TAYLOR

MONTPELIER, IND.

THOMAS TALLOTT TAYLOR

MONTPELIER, IND.

MOBILE SIEGE and COAST DEFENSE GUN

JACK HIGHAM, TORONTO, ONT., CAN.
With the Mounted Police in Canada

A Story of George Thompson's Adventure with a Half Breed

George Thompson was a big, powerful, rugged chap—honest as the day is long, absolutely fearless and always keen for adventure. His wonderful physique and sterling character qualified him for membership in one of the world's greatest military organizations—the Canadian Mounted Police.

The work required was to patrol the wilds of Western Canada, keep order in the little towns where there was no established government and to see that goods were not smuggled in or out of the trading posts or that no whiskey or any kind of liquor was smuggled in to the Indians.

Northern Canada at this time was a vast, unsettled country with a trading post only here and there, where the Hudson Bay Company bought furs from the Indian trappers in exchange for tobacco, blankets, etc. The Police Patrol went as far north as Herschel's Island, twenty miles inside of the Arctic Ocean near the mouth of the Mackenzie River. If you look this up on your map you'll see what long, lonely trips these fellows had to take and when an order was given, a man could not report until his mission was accomplished, even if it took his life.

They trained for a year at Regina before going out into the country on active service and George Thompson said that the training was pretty stiff. He was thrown from a horse in the riding ring and when he woke up he was in the hospital with two ribs broken but not another thing could be done after his discharge from the hospital until he had ridden this same vicious horse and mastered him. That is the way they hardened these men so that no danger could be great enough to bring a thought of fear to their minds.

The winters were long and severe and when an order was given in the winter to patrol so many miles due north, etc., they had to take a dog team of usually five dogs to carry their blankets and provisions. This sounds like a picnic, just riding about with five dogs dashing through the unbroken snow banks but all the riding a man can do is to step on the team to steady it going down hill or over a particularly bumpy piece of ground. For he may travel hundreds of miles without passing a traveling post or village and unless he has enough provisions for himself and his dogs, it means death. The dogs eat dried fish and one dog eats a pound of fish each day, so you see in two weeks a team of five dogs will eat 70 pounds of fish alone.

It was necessary to either travel a limited distance between two trading posts or else have stores of food "cached" along their route of travel. This was done during the summer months when traveling was easier. If you are a Boy Scout you know what a cache is but I'd better explain in case some of you don't know. Usually a tree or two trees not far apart have stripped of their bark about six or seven feet, then two more posts are put into the ground and a rough platform is built on top for the food. Flour, sugar, bacon and sometimes "penmaniac" (chiseled meat mixed with bear's grease and occasionally raisins) are left covered over with rubber blankets and the back and boughs of the trees. By smoothing the back off, the wild animals that prowled around that region cannot get any purchase for their claws so they cannot climb up and get the food.

It is a law of the forest that no person disturb another man's cache and the full blooded Indian is almost invariably trustworthy and honest. Thompson said that the Indians there were very friendly and rarely quarreled with, or stole from the whites. It is the half breeds that make all of the trouble and one of Thompson's most thrilling experiences came through a half bred named "Sechamish," which in our language means "Mosquito." Sechamish lived not far from Fort McMurray, where Thompson was stationed and one night he broke into the Hudson Bay Store and stole some tobacco or "estumoc," and a rifle.

A member of the Mounted Police was assigned to track down the thief. It didn't take him long to find the guilty person but when he smacked Sechamish's cabin, a loaded rifle was painted straight at him and the half breed told him that if he tried to make the arrest he would be shot. Canadian Mounted Police don't stop at threats so Thompson's friend advanced and sure enough got a bullet right through his heart. When he didn't return another man was sent out to find him and soon he returned to headquarters with the body.

In the meantime, knowing that he would be punished if he remained in that section of the country, Sechamish got together four of his Indian friends and started to escape. Indians are all naturally a lazy lot. They work only to provide themselves with necessities and as a good dog team is worth at least $125, there wasn't one of the five that owned one. So they hastily gathered their few belongings, putting them along with as many provisions as they could carry, into packs which they strapped on their backs. Then with their rifles they started off on snow shoes.

You can travel very fast in this manner if you know how to manage them, but even though they lost no time, they soon realized that the police were not far behind. Thompson and five others had been ordered out to get Sechamish "dead or alive" and they weren't losing any time either. They were following the trail very closely but the Indians had gotten a fairly good start and were still a few miles ahead.

If it had been summer time they could have hidden the trail, but with snow everywhere the only method left was to follow the police by taking different directions. Five miles ahead there was a small clearing. If they could reach this spot they had devised a clever and elaborate system of ambush and defense.

Each took a different and circuitous route all leading to the clearing but so complex that when the police arrived at the spot where they parted, a couple of hours had passed and the Indians were waiting in getting them located.

The Indians knew that the police would surround the clearing and rush them so they made a number of loopholes of about one hundred yards in length through the heavy undergrowth of the forest. Continued on next page
With the Mounted Police in Canada

The Mounted Police was a well-established force when Thompson and his men reached the spot. Just as they had assumed, the police began to surround the clearing preparatory to making a charge. While they were holding a hurried consultation over just what move each man was to make, a shot whizzed by Thompson so close that he struck his coat and the man standing next to him dropped dead. Another and another in quick succession, and by the time the police had thrown themselves on the ground for protection, four of those five-six-footers had been picked off and "went west," as the boys say.

A man thinks fast when his wit stands between him and death. Thompson and his remaining companion, lying flat in the snow couldn't waste time daydreaming. Each crawled slowly forward until they had reached a tree trunk large enough to shield them. In getting on their feet again, Thompson lost his balance and this act threw him to one side just enough to put his head on a level with the opening the Indians had made in the foliage. Bang! He had ducked just in time but in spite of merely losing his life he was happy, for he had now reached a position from which he could give the Indians a close of their own medicine.

It was then a five to two fight with the odds against the white men. They took off their caps and stuck them on the tree trunks so that they would show just enough to let the Indians think them still there. Then they crawled several feet away. With extreme care they rose, aimed—fired. These men were dead shots and before the Indians had time to get under cover, three had fallen and the fight was even.

It was now a fight from tree to tree. Thompson made a lucky shot and picked off the fourth Indian leaving Sechamsh whom they wished to capture, alive if possible.

Thompson's companionship was gradually working around behind Sechamsh and at the right moment when Sechamsh's rifle was raised to fire, he slipped the Indian in the right arm. Even though he was suffering great pain and physically out of the fight, Sechamsh did not surrender. He dropped behind a rock just as Thompson turned his gun on himself and fired his last shot.

It was a sad journey back to Fort McMurray but even though it had cost the lives of five brave men, the mission had to be performed.

20th Century Marvels of Transportation

The Smoking Room

The smoking room is located on the lower deck, entrance to it being gained through a swinging door so designed that it opens on itself, thus reducing to a minimum any fire hazard. The smoking room is attractively decorated and furnished with upholstered seats and chairs and with tables for serving refreshments from the adjoining bar. Windows along one side of the smoking room provide light and a chance to view the scenery. The kitchen is likewise located on the lower deck of the quarters, all cooking and refrigeration being electric. The electric stove has four hot plates in addition to two baking ovens and one warming oven. The dining room is the largest room in the quarters and adjoining this is a steward's pantry, located over the kitchen and connected with it by an electrically operated dumb-waiter, by means of which food is brought from the kitchen to the steward's pantry and from there served in the dining room.

In addition to simple toilet facilities, a bath room with shower is provided in the quarters.

Soil Replaced by Chemically Treated Water in Scientist's Vegetable Garden

Chemistry is continually moving forward with new discoveries being made every day. Just think, today scientists are actually growing vegetables and flowers in chemically treated water and without the aid of soil, and the results obtained are said to be far superior to vegetables grown in soil.

Dr. W. F. Gericke of the University of California claims you don't need to have a farm in order to be a farmer. Under his method all you need is a tank of water, chemicals, rabbit wire, excelsior and year seeds, and with this equipment he has been accomplishing wonders for the past seven years, growing fruits, vegetables and flowers in his own greenhouse. These tanks are 10 feet long, 2½ feet wide and 8 inches deep covered by ordinary "rabbit wire" and a layer of excelsior or coarse sawdust. He plants his seeds on this layer of excelsior and covers them with another layer and leaves them to grow. This covering of excelsior serves a double purpose in that it helps to keep the temperature of the water at 70 to 85 degrees Fahrenheit and also acts as a support for the growing plants.

Gradually the seeds begin to sprout, sending the roots down into the water where they absorb both moisture and nourishment. Dr. Gericke does not tell us exactly what chemicals are placed in the water but he states they are exactly the elements which plants obtain from soil and he has demonstrated that his harvest of tomatoes, for instance, far surpasses that of the ordinary farmer in both quantity and quality. The doctor has been able to obtain tomatoes from his plants for eight or nine months of the year and in comparing his tomatoes to those grown in soil he obtains two to three hundred tons per acre whereas the farmer obtains only five tons.

The doctor experimented on tomatoes also and his crop was twenty times the normal rate per acre. This tobacco also grew many times beyond the normal height of the plant and was found to be of superior quality.

Dr. Gericke's experiments are not limited to tomatoes and potatoes, but also include beets, carrots, lettuce, beans and even certain types of flowers. In practically every instance the plants grow far beyond their normal size and the harvest is many times the normal rate. Tests are now being made in greenhouses in California and Montebello, Calif., to ascertain just how successful this process is and further tests in different sections throughout the country will be made to determine what methods must be used on different crops and under different climatic conditions. Dr. Gericke hopes to be able to write directions that will be available for all people to use and if he is successful the value of such a method is unlimited, especially in overcrowded countries like Italy and Japan where the climate is mild. A food shortage would then be unheard of.

Roads of Salt

Several experimental highways in the surfacing of which common rock salt was used have been constructed in the United States. The roadways are made of ordinary rock salt, and they are built to withstand devastating floods in areas where they occur. About 200 miles of these salt highways have been laid down in various parts of the country, and after several months' use carrying heavy traffic they have proved entirely satisfactory. The rock salt not only compacts the clay but also crystallizes in the road surface and retards evaporation of moisture, thereby keeping the surface moist and firm and providing practically a non-skid road.