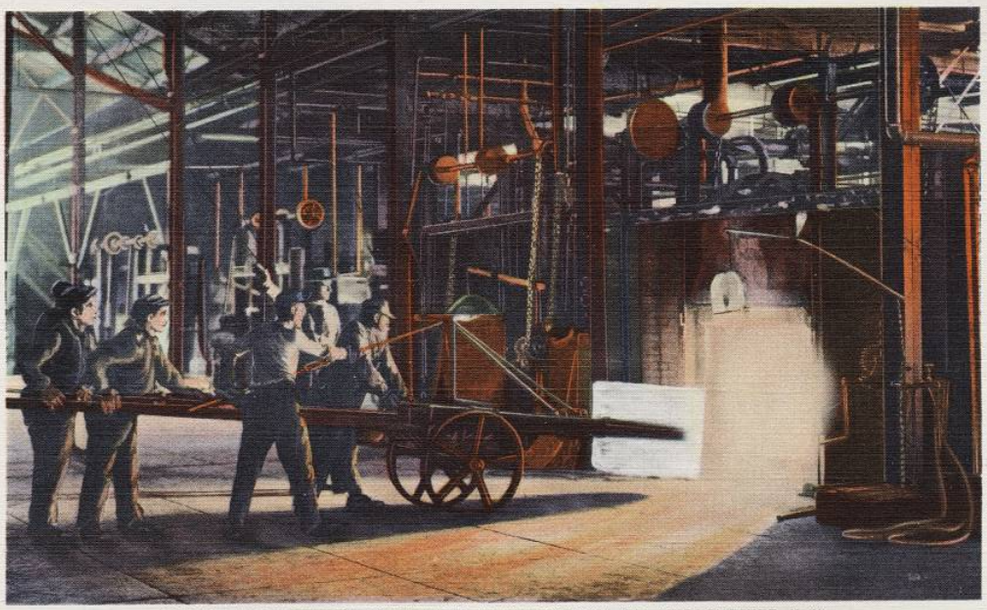
16

THE LIGHT•BENDERS



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IN THE GLASS PLANT OF THE BAUSCH & LOMB OPTICAL CO. AT ROCHESTER, N. Y.

AIR VIEW OF THE BAUSCH & LOMB OPTICAL CO. PLANT AT ROCHESTER, N. Y.

ESTER, N. Y.

DERS

DERS

THIS scene in America's leading optical institution shows a pot of molten glass being removed from the oven. The **Bausch & Lomb Optical Co.** is the only optical manufacturer in America making its own optical glass for eyeglass lenses, microscopes, telescopes, photographic lenses, etc.

C. T. ART-COLORTONE", MADE ONLY BY CURT TEICH & CO., INC., CHICAGO, U. S. A.

POST CARD

PLACE ONE CENT STAMP HERE

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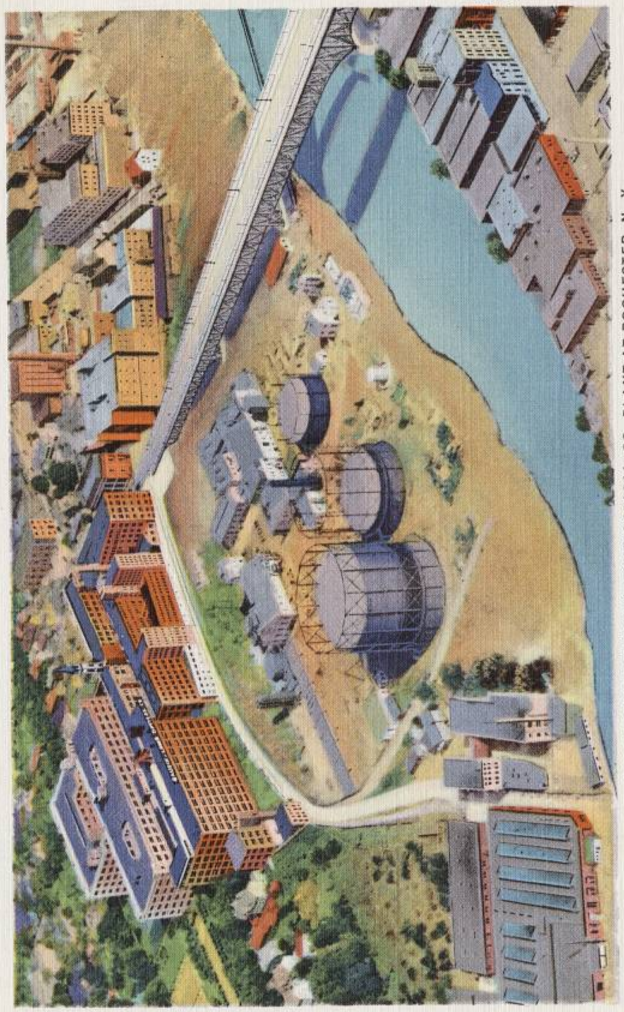

AIR VIEW OF THE BAUSCH & LOMB OPTICAL CO. PLANT AT ROCHESTER, N. Y.

ESTER, N. Y.

THE LIGHT • BENDERS

The object of this booklet is to better acquaint you with that interesting phenomenon "Light" and how the Bausch & Lomb Optical Company have put light to work for Science, Education, Industry and the benefit of mankind in general.

PUBLISHED BY THE
BAUSCH & LOMB OPTICAL CO., ROCHESTER, N. Y.

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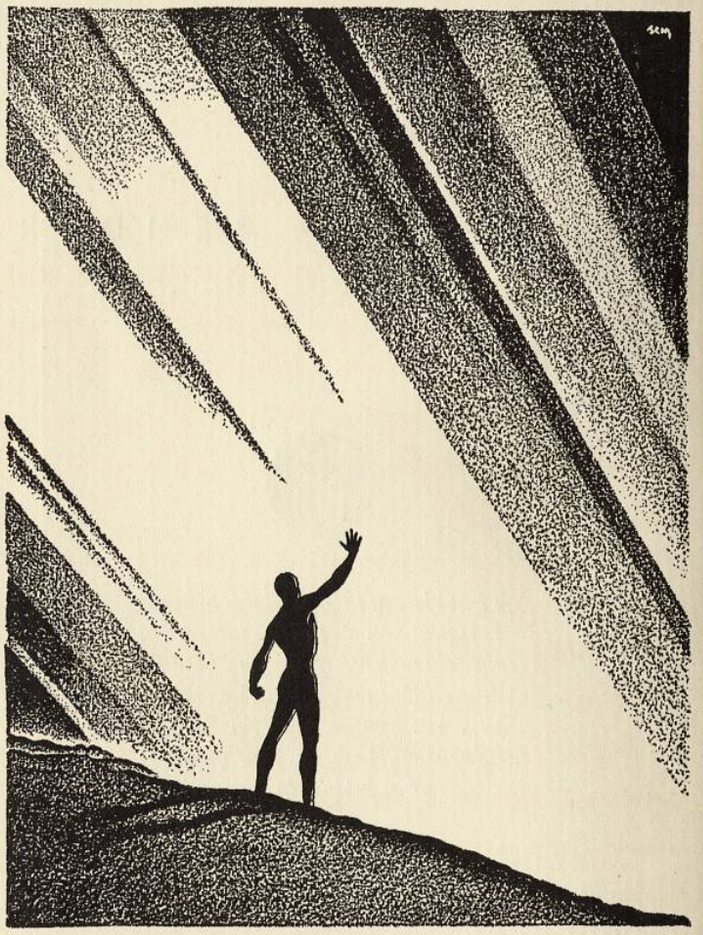
"C. T. ART-COLORTONE", MADE ONLY BY CURT TEICH & CO., INC., CHICAGO, U. S. A.

The Bausch & Lomb Optical Co. plant at Rochester—America's largest and leading manufacturer of optical products. Here are produced annually millions of eyeglass lenses and a complete line of highly precise scientific optical instruments. Illustration shows Bausch bridge and Genesee River at the right, part of the Bausch & Lomb glass plant at the lower left, Bausch & Lomb main buildings upper left, and below them the great gas tanks which supply the millions of cubic feet of gas used annually.



LIGHT—THE SYMBOL OF LIFE—
THE SOURCE OF KNOWLEDGE.

LIGHT!

In 1893 a beam of light left Arcturus, the highest star in the northern hemisphere. Forty years later, on May 27, 1933, it arrived at Chicago, was diverted to a photo-electric cell arrangement and was made sufficiently powerful to connect the lighting circuit for illuminating the enormous and marvelous Century of Progress Exposition!

Traveling at the terrific speed of 186,000 miles per second, the light from the sun reaches us in the comparatively short time of eight and 3/10 minutes. It gives us our day and its reflected glory in the moon brightens our night. It is as essential as air and water to life on the earth and without it vegetation and mankind would quickly disappear. What is the nature of this unusual medium?

In 1685 Sir Isaac Newton, the greatest scientist of his day, suggested that light consists of the tiniest imagin-

able bodies, or corpuscles, shot out from a light source at a high rate of speed. Five years later Christian Huygens, a contemporaneous genius, published his theory that light travels from its source in waves, much as water waves travel from a point of disturbance.

Now we believe that light behaves as if it were composed of infinitely small particles traveling as though it were a wave motion in the so called luminiferous "ether," and which it is said must be harder than steel. But what kind of a substance can that luminiferous ether be? Even Einstein isn't quite sure. However, Edison and his contemporaries in their numerous experiments did not discover what electricity really is, but they found out how to use it for the benefit of mankind. Likewise we have found out how to use light for the good of humanity.

After Newton and Huygens, further discoveries which increased our ability to bend light rays to our needs were made. With this ability we make eye-glasses, microscopes, telescopes and numerous other instruments.

MODERN OPTICS

The first American physicist in the optical field was Benjamin Franklin, who invented bifocal spectacle lenses usable for both distant vision and reading or sewing. In 1853 John Jacob Bausch, who shortly after became associated with Henry Lomb, opened a small optical establishment in Rochester, New York, for the manufacture and sale of spectacles and such optical instruments as were then available. Before then, glasses of the most inferior type were sold at the highest price, by peddlers, barbers, drugstores, almost anybody. Bausch & Lomb founded their business on the idea of one quality only—the finest. The early years of this young enterprise were filled with heart-breaking discouragements, but the pioneers persisted in their ideal of quality. Today Bausch & Lomb is one of the largest optical companies in the world. Many concerns have made cheaper optical goods than Bausch & Lomb. None ever made them finer.

Edward Bausch, the son of the founder, first visualized the possibility of also producing microscopes and other

optical instruments, in such quantities and at such prices that they would be within the reach of almost anyone who sincerely desired them.

In 1872 Edward Bausch made his first microscope. Today a Bausch & Lomb Microscope, magnifying up to 300 diameters, may be had for $18.50. Thousands of these are owned by young people of school age. Medical students in scores of colleges are happy in the possession of more elaborate Bausch & Lomb Microscopes, especially designed for their needs. World-famous scientists use Bausch & Lomb Microscopes of the utmost attainable resolving power, magnification and precision.

Other instruments followed — instruments that have enabled man to attain his present astounding knowledge in many fields and which are leading him, almost daily, to new discoveries.

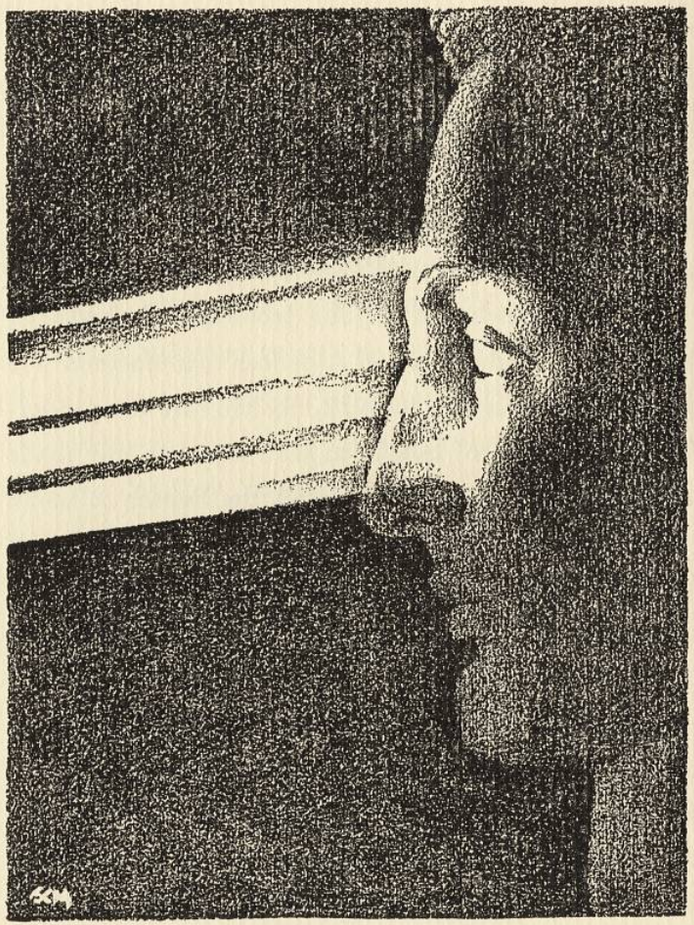
Everyone knows that optical instruments are responsible for much of our present scientific knowledge. Scarcely an item is used in our everyday life that does not in some part of its development rely upon optical instruments.

OPTICAL GLASS and BAUSCH & LOMB

Prior to 1917 all optical glass was made in Europe, and when the United States entered the War, America's supply of optical glass was very nearly exhausted.

William Bausch, son of John Jacob Bausch, had long realized the need of glass of American manufacture. He began his experiments in 1912. By 1917 he was producing optical glass of quality at least equal to any made abroad. When War was declared, the Bausch & Lomb Glass Plant was rapidly extended in order to supply the need for such instruments as range finders, periscopes, binoculars, aerial photographic lenses, searchlight reflectors, etc.

The Bausch & Lomb factories occupy 1,000,000 square feet of floor space, and manufacture literally thousands of different optical products. B & L workers must be of an exceptionally skilled type. Much of their work must be so precise that it can be measured only with wave lengths of light, and it takes approximately 50,000 light waves to give the equivalent of one inch.



THE EYE—THE OPTICAL PORTAL THROUGH WHICH THE LIGHT OF KNOWLEDGE ENTERS THE MIND.

EYE DEFECTS AND THEIR CORRECTION

While the human eye is a simple optical instrument, in some respects it is more intricate than the most complicated device yet produced by man. The eye is comparable to an ordinary camera. Thus the eye has its lens, its film (the retina), its diaphragm (the iris), and its shutter (the eyelid).

When we look at an object, the lens of the eye focuses an image of the object on the retina, the optic nerves relay it to the brain which marvelously interprets the image to our consciousness.

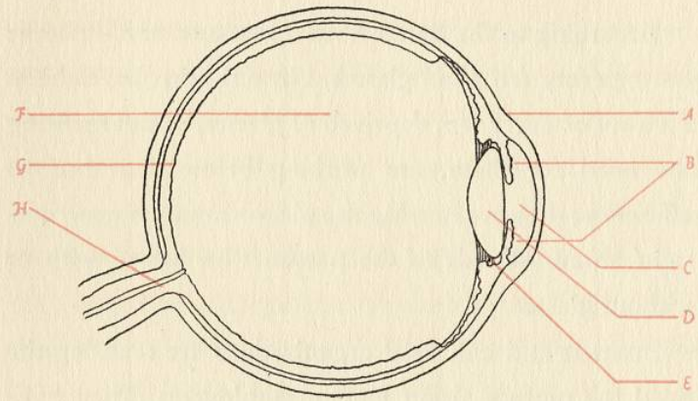
That, of course, applies to the perfect eye. But thousands upon thousands of careful examinations have shown that not half of us have perfect vision.

When a tooth begins to decay, it usually aches, and this kindly warning of Nature reminds us to consult a dentist. Unfortunately, the eye does not usually ache like a tooth. So, millions of people dissipate their usual efficiency by straining their eyes unduly, without any

suspicion that they need attention. The usual symptoms are attributed usually to other causes. These symptoms may include headaches, nervousness, indigestion, irritability, quick fatigue, constant tiredness, or just plain "nerves."

There are too many defects of human vision to describe them in detail. Myopia (near-sightedness), the inability to see objects except near to the eye with adequate clarity, is corrected by a concave lens of the required power. The opposite fault, hyperopia (far-sightedness), is corrected with a convex lens. Astigmatism, caused by unequal curvature of the cornea or the crystaline lens is corrected by cylindrical forms of lenses which afford the desired curve in different meridians according to the power required. Strabismus (crossed eyes) is often corrected by muscle training or by prismatic types of lenses. The presbyopia of middle life is due to the inability of the eye to focus on near objects within a certain range and in cases of distance corrections prevailing, bifocal lenses are prescribed.

The skilled refractionist, with the aid of the most pre-



THE EYE:

A.—Sclera or white of the eye.
B.—Iris which fixes the size of the pupil.
C.—Anterior Chamber, contains watery fluid.
D.—Lens.
E.—Suspensory Ligament which holds the lens.
F.—Vitreous, transparent.
G.—Retina, "the film".
H.—Central artery and optical nerve.

cise optical instruments, measures these and other optical errors which exist in various degrees and combinations, and by his measurement is able to determine the exact prescription necessary to give each eye the finest vision which optical science can afford.

According to the Better Vision Institute, seven people out of every ten need glasses, but only two have them. Five out of every ten, deprived of glasses, or not realizing the need for them, are working below their normal efficiency; they are missing the pleasures which good eyesight always affords to the person who has it, with or without glasses.

Business and industrial organizations are realizing the need for perfect vision among employees. They have proved the greater efficiency of employees with good eyesight, and for inescapable economic reasons they are beginning to insist upon an eye examination for every employee. The reward of the employers has been lowered costs, decreased waste, and increased production.

The licensed eye examiner of today has spent years in learning his profession. He has at his command optical instruments which enable him to determine the exact cause of a defect, should there be any.

Nothing worn by a human being must be so precisely made to his own personal needs as his eyeglasses. Hence Bausch & Lomb lenses and frames are sold only through

reliable houses. Only men of scientific training and professional reputation may offer Bausch & Lomb eyewear to the public.

Bausch & Lomb has made innumerable contributions to the eye comfort of America. It is the only producer of eyeglass lenses that makes its own glass and hence is the only one that can exercise absolute control of quality from sand to finished product. It is the originator of the "Orthogon," wide vision lens which affords the same perfect correction at the margin as at the center, and which is the result of years of mathematical computation and research.

A FLY MAGNIFIED 10,000 TIMES WOULD BE AS TALL AS A 10 STORY BUILDING. MAGNIFICATION HAS ENABLED SCIENTISTS TO COMBAT BACTERIOLOGICAL MONSTERS.

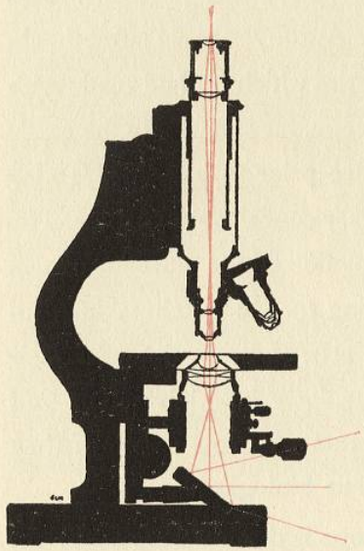
MICROSCOPIC WORLDS

"I can show you a new world, a world that has existed since the beginning of time, a world that surrounds us, that is in every place at which we look, yet a world that no man has ever seen before."

In the middle of the 17th Century an obscure janitor in the town of Delft, Holland, made this statement. This self-taught experimentator, Antony van Leeuwenhoek, was referring to the discoveries which he had made with a home-made model microscope, far superior to the crude simple magnifiers in existence prior to his time. Today we have a microscope for every conceivable purpose. The simple magnifier is the companion of the more inquisitive person and the daily working tool in watchmaking, engraving and other similar arts. Microscopes, in their simplest form, are used regularly by high school and college students. In their more complex designs they are treasured by our eminent biologists.

The physician's miscroscope is designed especially for

the medical profession. The petrographical type is extensively used by the geologist and by ceramic, mining and oil engineers. The metallurgist's instrument is particularly designed for observing the grain or crystal structure of a piece of metal. The research microscope is an extremely elaborate and highly perfected instrument. There are other models designed to fit the particular needs of the tool maker, the paper manufacturer and the brewer.



The red lines indicate the path of light through the optical system of a Bausch & Lomb Microscope.

The Microtome cuts the tissue of any part of the human or animal body into slices as thin as 25,000 of an inch. The micro-manipulator affords tiny mechanical fingers and dissecting knives with which these tiny organisms may be handled and dissected.

The Centrifuge holds two or more tubes, revolved at a tremendous speed. The particles suspended in the liquid are forced by centrifugal action to the bottom of the test tubes, gathering in layers according to their weights. The microscopist removes and examines the solids.

The Physician uses the Haemacytometer to count blood corpuscles or other particles in a solution. It is also used in the dairy industry to determine the number of bacteria in milk.

One of the most marvelous inventions is the new Centrifuge Microscope. With it one can see objects which are whirling at the rate of 10,000 revolutions per minute, or a peripheral speed of four miles a minute! Micro organisms, while being revolved at this terrific speed, can be watched through the microscope as though they were standing still.

THE TELESCOPE, WHICH HAS BRIDGED BILLIONS OF MILES OF SPACE TO REVEAL NEW UNIVERSES, IS UNFOLDING NEW ASTRONOMICAL FACTS DAILY IN ITS CONQUEST OF THE HEAVENS.

THE CONQUEST OF SPACE

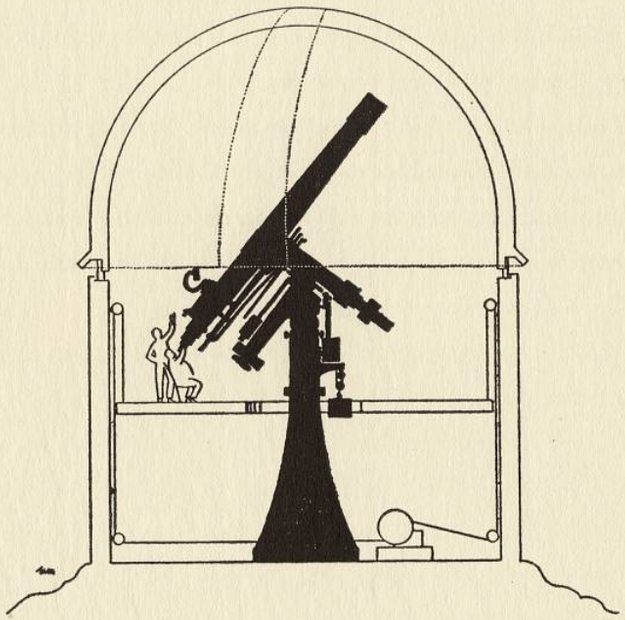
In 1609 A. D. Galileo made the universe shrink! So far as vision is concerned, he did just that, by producing the first truly practical telescope.

Today the reflecting telescope at Mt. Wilson Observatory, California, enables us through its 100-inch reflecting lens to study stars so far away that, should they suddenly cease to exist, the light which last left them would take millions of years to reach our earth.

Most of us are inclined to think of telescopes in terms of astronomers and observatories. However, Bausch & Lomb offers models that are relatively inexpensive, especially suited for use in the home or school. Not only do they bring us the wonders of the heavens, but they enable our eyes to span great distances on land and sea and to observe far away objects as though they were near at hand. They are ideal for use at country homes, summer resorts, yacht clubs and other points of vantage.

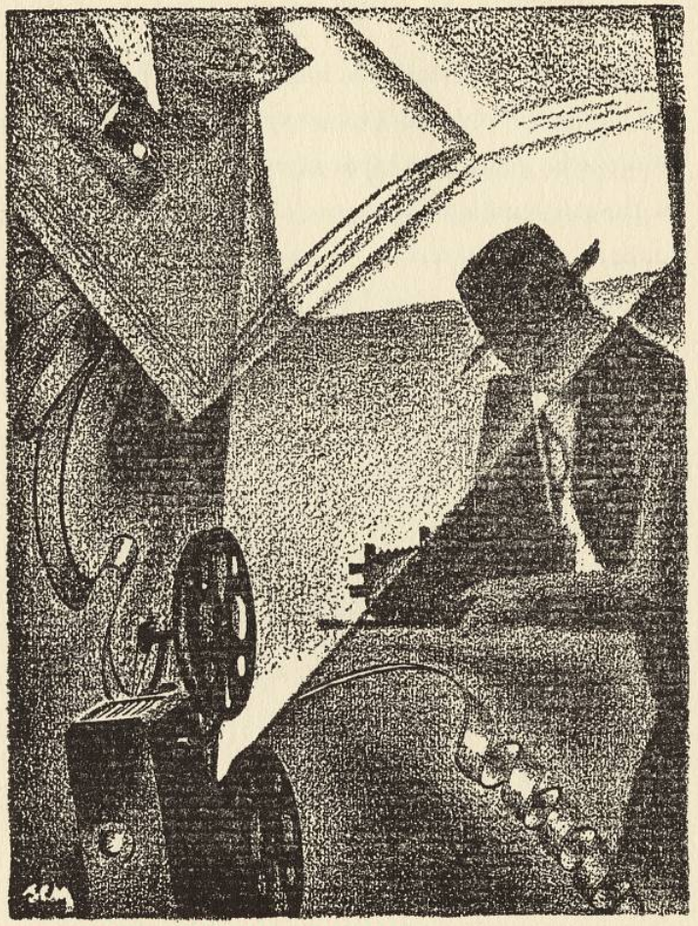
The Coin Telescope is a similar type of instrument

fitted with a coin mechanism which enables the user to employ the instrument for a predetermined length of time by inserting a dime or a nickel. This instrument has



This cross-section shows the mechanism of an observatory telescope. The slotted dome revolves as shown by the dotted lines and the observation platform can be raised or lowered.

proven to be of remarkable interest to the public in observing distant objects. Operators of office buildngs and resorts who place telescopes where a commanding view of the surrounding country is obtained will be well rewarded. The Binocular is really two telescopes so mounted that they serve both eyes. People, who realize how Binoculars, in effect, transport them miles away in an instant, carry a pair consistently. A good Binocular is the working tool of the Army and Navy officer, sportsman, the explorer, the forest ranger, and the joy of the motorist and traveler.



PICTURES, THE UNIVERSAL LANGUAGE, ON PAPER OR SCREEN, ARE THE CONTRIBUTION OF OPTICAL SCIENCE TO EDUCATION AND ENTERTAINMENT.

PICTURES
THE UNIVERSAL LANGUAGE

Since the dawn of time man has made pictures. We have been able to learn much of the Stone Age because ancient man scratched crude pictures of the animals and people of his day on the wall of his cavern.

Until wood cuts were invented, we had no way of reproducing pictures. Today there are numerous ways, (halftone printing, lithography, rotogravure), but practically all methods require the use of some sort of an optical system.

It can be readily understood the great part which pictures play in education. Remember the old school geography? This is actually the child's first journey to foreign lands, for he sees pictures from the four corners of the earth. Were it not for these pictures a child would build up every conceivable type of grotesque "mind-pictures" and he would have only a true picture of those things with which he came in personal contact.

What an important part pictures have played in our present day business and commerce! Fortunes have been

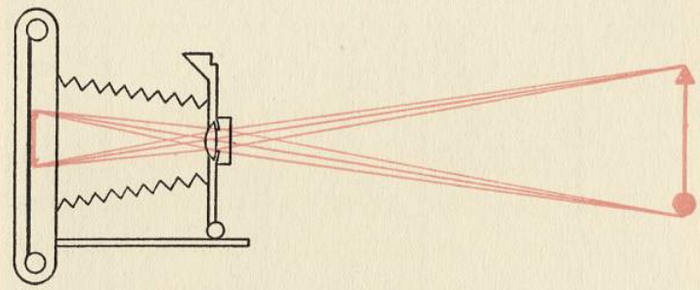
built up from business enterprises by the use of pictures in their advertising. The advertising man will tell you that a picture with a few words of copy often can tell the story more quickly and better than a page of printed words. With the development of various types of photography has come the realization of the value of photographic records. Modern industry maintains huge files of photographs of their products, the development of their plant, the personnel of their offices and factory, the interior of their plant, various operations in the production of their products, and many other valuable and interesting reference pictures.

Most of our newspapers, magazines and books are copiously illustrated. Police Departments keep records of crimes in the form of pictures—fingerprints, portraits of convicted prisoners, the scene of the crime photographed from different angles. Science, with the development of the photomicrograph, has found pictures of tremendous value to show the world the result of experiments and the proof of discoveries. And now with the application of motion pictures to photomicrography, records may be

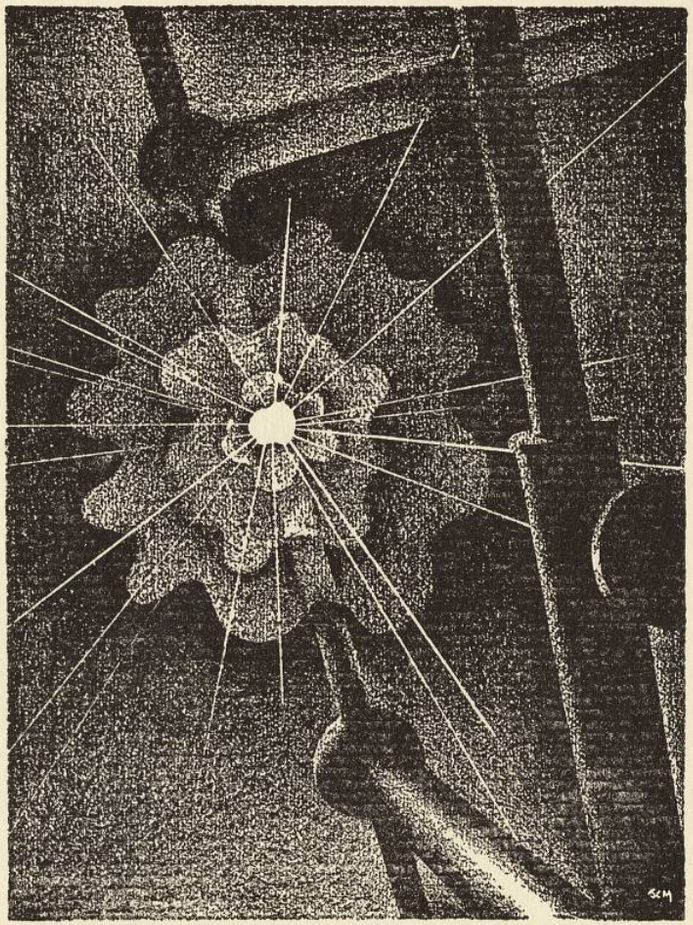
kept of the development, growth, habits and movement of microscopic life.

Without lenses still photography and moving pictures would be impossible. Lenses take the pictures, project them. With the aid of lenses sound is turned into light and then back into sound to produce talking pictures.

In short, much of our knowledge of other people and other times, most of the mental images derived from all sorts of publications, all of the enjoyment of the motion picture, photography in all of its varied forms, and the graphic arts of today would not exist without the aid of modern optics.



The path of the rays of light which travel from an object through the camera lens and onto the sensitized photographic plate or film is shown above. Note that the image is inverted.



KNOWLEDGE OBTAINED THROUGH RESEARCH AIDED BY OPTICAL EQUIPMENT HAS LED TO OUR PRESENT HEIGHTS IN THE AGE OF METALS.

ANALYZING MATERIALS

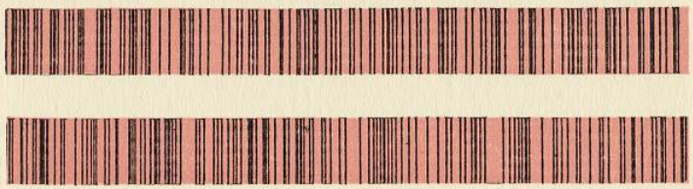
Along the white stretch of bleached sand streaks a roaring mass of metal. Over 250 miles per hour,—better than four miles per minute was the speed of this man made automobile! It would seem that this metal rending speed would disintegrate the very material from which this car is constructed. Much less romantic but equally as amazing is the automobile tire which carries the American public on its travels. The fabric and rubber in the average tire bounces, knocks, and skids over twenty thousands miles of all kinds of road. Many other feats of endurance of materials could be called to attention. Daily marvels are happening which seem beyond the realm of possibility—which a few generations ago were beyond the wildest vision of mankind but are now commonplace events.

All of these accomplishments are due to long and arduous research. And rare is the piece of research which does not require the use of an optical instrument. One of

the optical instruments which is made specifically for the purpose of analyzing materials is the Spectrometer.

The design of the Spectrometer is based upon the fact that light can be broken up into its component colors. With it we are able to determine the elements which compose the stars. It is also used in the medical profession for analyzing organic materials; in the mining industry for analyzing rocks, ore and various minerals; in industry for quantitative analysis of raw materials.

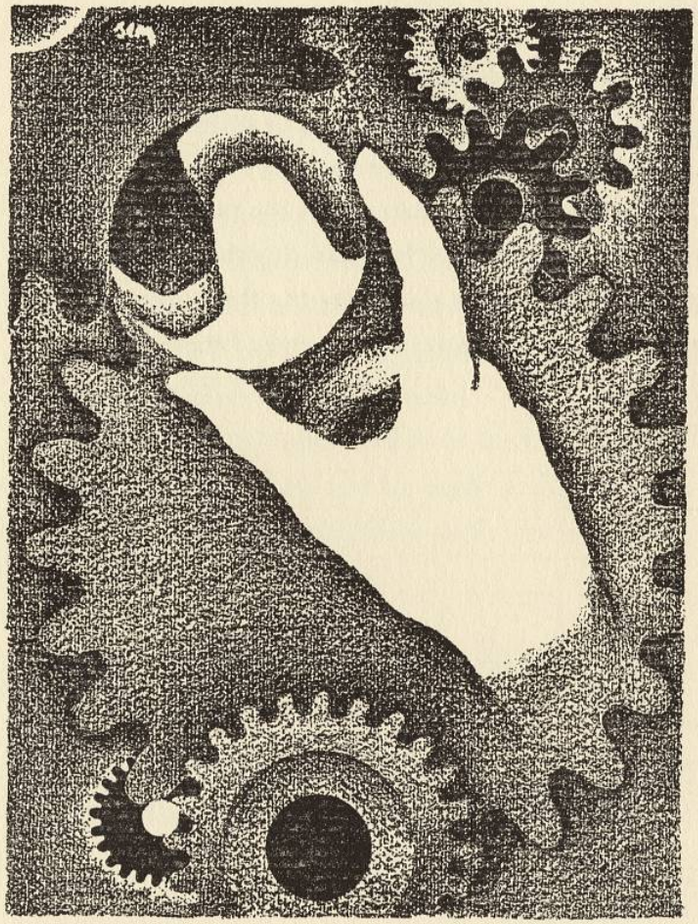
Spectrographic equipment varies in size from the small hand spectroscope which can be easily carried in one's pocket to the large Quartz Littrow outfit which weighs in the neighborhood of a half ton.



Represented above are the Fraunhofer lines in the spectrum of two different materials. The composition of each is indicated by the presence of the lines typical of that material.

The Colorimeter reveals the amount of a substance present in a liquid by comparing its color with that of a solution of known concentration.

The Refractometer determines the refractive index of a transparent substance by measuring the degree to which a ray of light is bent upon entering that substance. The Saccharimeter measures the amount of sucrose in a sugar solution.



ACCURACY HAS MADE POSSIBLE THE MECHANICAL WONDERS OF THE AGE. OPTICAL SHOP INSTRUMENTS ARE AIDS TO EXTREME ACCURACY.

SCIENCE ENTERS THE WORKSHOP

Optical instruments are used in Machine Shops to obtain a closer, better, more highly magnified picture or view of the material or part upon which work is being performed; to secure smoothness of surface, to obtain closely fitting parts, and thereby produce dependable, durable products.

A Metallograph of the proper magnification will reveal the size, shape and general characteristics of the grain or structure in a piece of metal. It is due to this fact that we are able to have automobiles and airplanes that travel hour after hour at a speed which would rend inferior metals apart. In fact, modern metallurgy, with its resultant skyscrapers, bridges and machines, is founded entirely on miscroscopic analysis.

The Contour Measuring Projector is used to check the contours of small machine parts, such as gears, hobs, cutting tools and the like. A beam of light casts an exact but magnified shadow of the part on a master pattern or screen. Errors and irregularities are instantly detected.

The Toolmaker's Microscope carries accuracy into the workshop, so that rigid specifications may be maintained. It permits measurement to an accuracy too fine for the human eye or a mechanical device to gauge.

Before starting a machine on mass production, the machine must be set up properly, its tools must be properly ground. Only in this way can the machine run hour after hour and produce parts which will pass inspection. The Optical Protractor is used to assure that a piece of work is set up in the machine at the proper angle. It is correct to one minute of arc—equivalent to an angle between two points twelve inches apart and over five eighths of a mile distant.

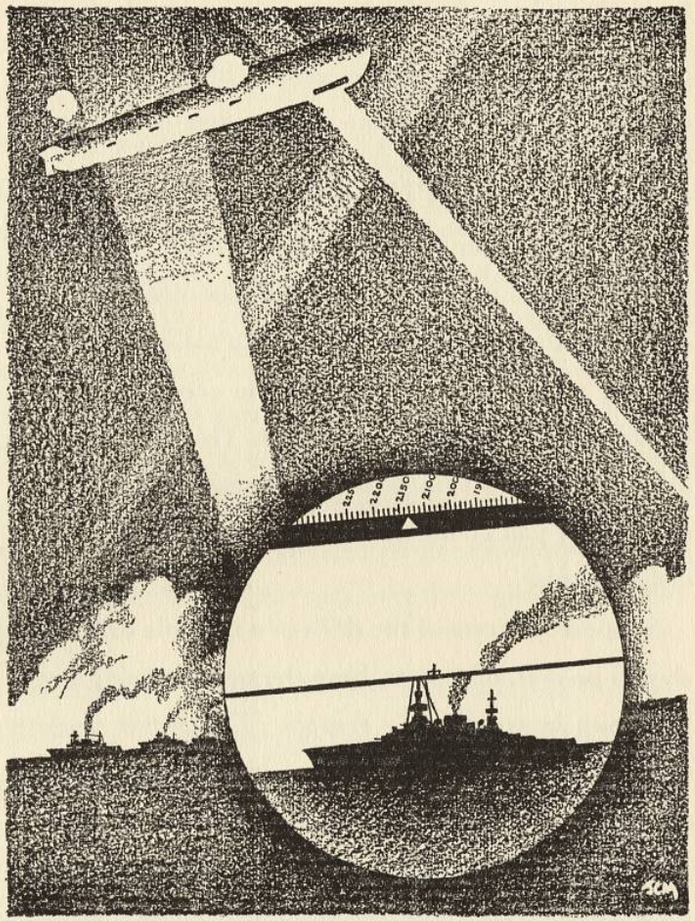
Another instrument has been developed that the machinist and tool maker can use under conditions which will not permit the use of any mechanical testing instruments. This instrument is the Shop Microscope and it is small enough to be carried conveniently from one place to another. It is only 8″ long, carries its own illuminating unit, and is used as a utility magnifying and inspection instrument. It is a valuable instrument in itself and it is

doubly valuable when used in making observations which can later be checked on one of the other optical instruments.

The Optical Index Device is an attachment which is used in connection with the dividing head on machine tools for drilling holes at an equal distance from each other on a circle and other work of this nature. It assures a lining up of the work that is more accurate than the dividing head without the attachment. This instrument enables you to see measurements in thousandths of an inch as easily as you could see measurements of 1/8″ on the ordinary ruler.

Suppose that one of the drills in a multiple drill set-up should be dull, off center, have the wrong cutting angle, or wrong in some other respect. The entire machine would be operating inefficiently, and not only the one defective drill, but all drills are slowed up in their work.

In such instances the optical drill gauge is practically indispensable; with it drills can be gauged so that every measurement on them is as near accurate as it is humanly possible to make them.



IN THE SCIENCE OF WAR, RANGEFINDERS, PERISCOPES AND BINOCULARS ARE THE FAR-SEEING EYES OF THE ARMY AND NAVY.

OTHER OPTICAL INSTRUMENTS

The number and variety of optical instruments is almost unlimited. In war, as in peace, they play their part. They are the eyes of the Army and Navy. Rangefinders, from small portable models to the huge instruments 26′ 6″ long, play an important part in offensive and defensive warfare. Imagine being able to hit a target which a gunner cannot even see, a target as far as nineteen miles distant! This is possible with the aid of a rangefinder. Periscopes, Gun Sights, Bore Sights, Searchlight Reflectors, some of the latter five feet in diameter, which are used by the coast guard and on battleships, all are optical instruments essential in modern warfare.

In contrast with these instruments of warfare is a simple optical instrument which very few people consider as such, the mirror. Curved mirrors of extreme precision have many uses. Thousands of them are used in

Hollywood for illuminating movie sets. The airplane pilot, as he speeds through the night, depends upon the searchlight with reflecting mirror, to guide him on his way. Tiny mirrors of optical precision help the throat specialist, dentist, and others in their work.

These are just a few of the special optical instruments produced by Bausch & Lomb. In addition they manufacture optical parts and units that are used in a wide variety of industries.

A special catalog of standard lenses, prisms and other optical parts is available on request to scientists and laboratory workers.

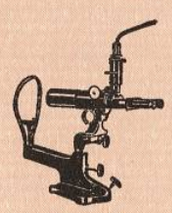
We have but to look around us to see the important part which all of this optical equipment plays in our everyday life as well as in the advancement of science. Optical instruments have given us our present day civilization, and without question they will lead us still further to more remarkable developments.

ON THE FOLLOWING PAGES

The Bausch & Lomb Optical Company manufacture literally thousands of products which are used in science, education, industry and the everyday walks of life. The following pages illustrate and describe a few typical instruments of the complete B&L line.

Ophthalmic Lenses: Bausch & Lomb eyeglass lenses include single vision and bifocal types in white and tinted glass. Orthogon has become justly famous as the leading wide vision type.

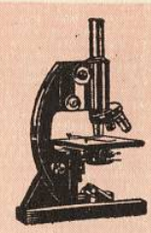
Frames and Cases: Bausch & Lomb frames and mountings enhance the appearance and are afforded adequate protection by cases styled and manufactured by Bausch & Lomb.



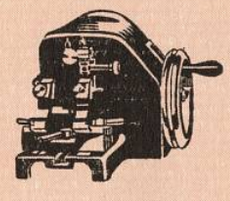
Ophthalmic Instruments: One of the major factors in correcting one's eyesight is accuracy. B&L Ophthalmic Instruments assist the refractionist in making accurate examinations.

Ophthalmic Shop Equipment: Lenses must be properly surfaced and mounted according to the prescription. B&L equipment assures this work being properly performed.

Microscopes and Accessories: Microscopes, which Bausch & Lomb manufacture in numerous types and models, are used in the industrial, educational and professional fields.

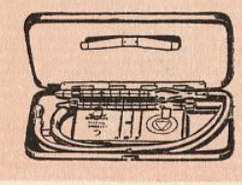


Microtomes: The Microtome is an important instrument to the microscopist who examines cross sections of specimens. The microtome cuts sections as thin as 1/25000 of an inch.

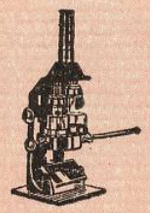


Centrifuges: These instruments revolve test tubes at a high speed, settling the liquid contents in layers according to weight. The microscopist can then examine the segregated materials.

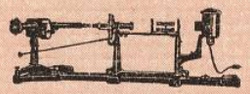
Haemacytometers: Instruments which enable medical microscopists to systematically examine known quantities of blood and to perform blood counts.



Refractometers: Refractometers are used to measure the refractive index of a transparent substance, by measuring the degree to which a ray of light is bent when it enters that substance.



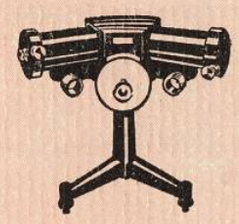
Colorimeters: Colorimeters are used to analyze solutions by comparing the color of an unknown with that of a solution of known concentration.



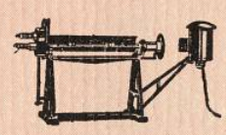
Spectrographic Apparatus: This equipment is used by the analyst to determine what elements make up the material he is analyzing.

Scopometers: These instruments are used in the laboratory to determine the turbidity of a solution.

Monochromators: The Quartz Ultra-Violet Monochromator is used by the physicist or scientist to furnish a source of ultra-violet monochromatic light.

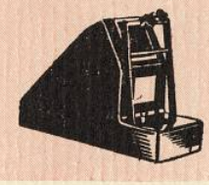


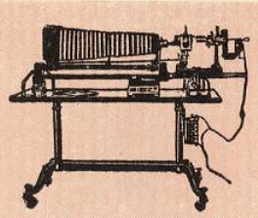
Saccharimeters: The saccharimeter is used by the sugar chemist to determine the amount of sucrose in sugar.



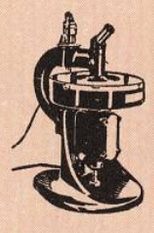
Polariscopes: Polariscopes furnish a means for quickly and easily locating strains in glassware. It is used in the optical, ceramic industry.

Opacimeters: A recently developed instrument for the paper industry. With it the paper manufacturer can readily determine the opacity of various papers.

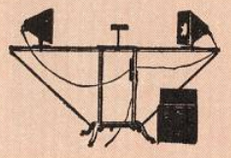




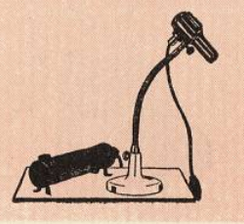
Photomicrographic Apparatus: This equipment enables the microscopist to keep a record of his observations so that he may refer to them whenever necessary.



Centrifuge Microscopes: This instrument enables the microscopist to observe micro-organisms while they are being revolved at the rate of 10,000 times per minute.

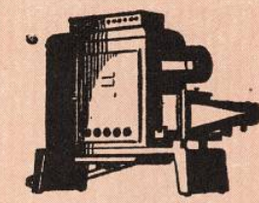


X-Ray Stereoscopes: With this equipment the physician can see pictures of internal organs in true stereoscopic relief, thus aiding him greatly in a diagnosis.

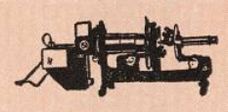


Operating Lamps: These lamps furnish the surgeon with the proper illumination so necessary in the various operations he performs.

Balopticons: Bausch & Lomb Balopticons aid in visual instruction and are used throughout the educational field to assist teachers in their classroom lectures.

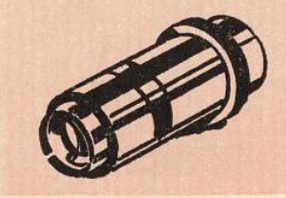


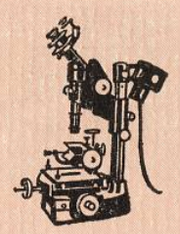
Micro-Projectors: Projectors which throw an enlarged image of a microscopic object onto a screen so that it can be viewed simultaneously by a group.



Euscopes: The Euscope is a micro-projector which has its own opaque and translucent screen. It can also be used to make photomicrographs.

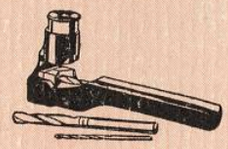
Projection Lenses: Bausch & Lomb Cinephor projection lenses are used by motion picture theatres throughout the world.



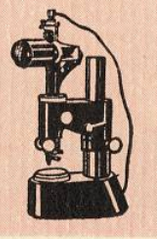


Toolmaker's Microscopes: With the aid of the Toolmaker's Microscope, laboratory accuracy in measurement is brought into the shop of the machinist and toolmaker.

Contour Projectors: This instrument is vitally important in checking the accuracy of small machined parts by comparing an enlarged shadow of them with master charts.



Shop Instruments: Bausch & Lomb Shop instruments are important factors in obtaining a high degree of accuracy in the metal working industry.



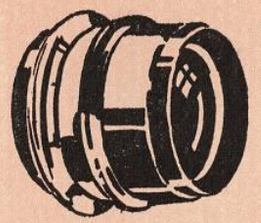
Optical Comparators: Wherever a number of similar parts are to be measured, the Optical Comparator offers an extremely accurate and rapid means of inspection.

Binoculars: B&L Stereo-Prism Binoculars are the eyes of the outdoor world. They are the tool of the outdoor worker and an added source of enjoyment to the sportsman and traveler.

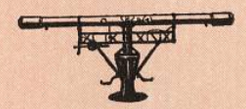
Telescopes: Well suited for terrestrial or celestial purposes for individuals or schools. Magnifications from 24X to 120X.

Gem Microscopes: This low priced microscope is an excellent source of entertainment and education for the amateur microscopist.

Magnifiers and Readers: Bausch & Lomb Magnifiers and Readers have gained a name for themselves as glasses of fine quality. They are made in a large variety to suit all purposes.



Photographic Lenses: Photographers, both movie and still pictures, the world over, know Bausch & Lomb lenses to be of exceptionally fine quality.



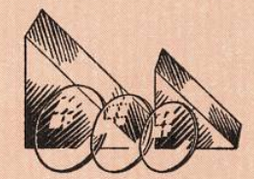
Range Finders: The rangefinder is one of the most important instruments in modern warfare. With its aid, a gun can be trained on a target that the gunner cannot see.

Battery Commander's Telescope: The Battery Commander's Telescope is another important military instrument, especially for observation from concealed positions.

Reflectors: Bausch & Lomb manufacture many styles of reflectors, ranging in size from small dental mirrors to huge searchlight reflectors, five feet in diameter.

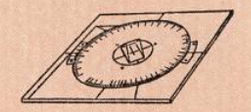
Optical Glass: Bausch & Lomb is the only American optical manufacturer that makes its own glass. This fact facilitates the control of quality from the raw material to the finished product.

Optical Parts: Several thousands of optical parts are listed in the B&L optical parts catalog. Bausch & Lomb furnishes optical parts for many manufacturers.



Optical Test Glasses: Test glasses are used wherever exceptional accuracy of surface is paramount. These test lenses measure to an accuracy of a wave-length of light.

Tangent Meters: An optical-mathematical instrument that measures the tangent to a curve at any point, eliminating tedious computation.



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