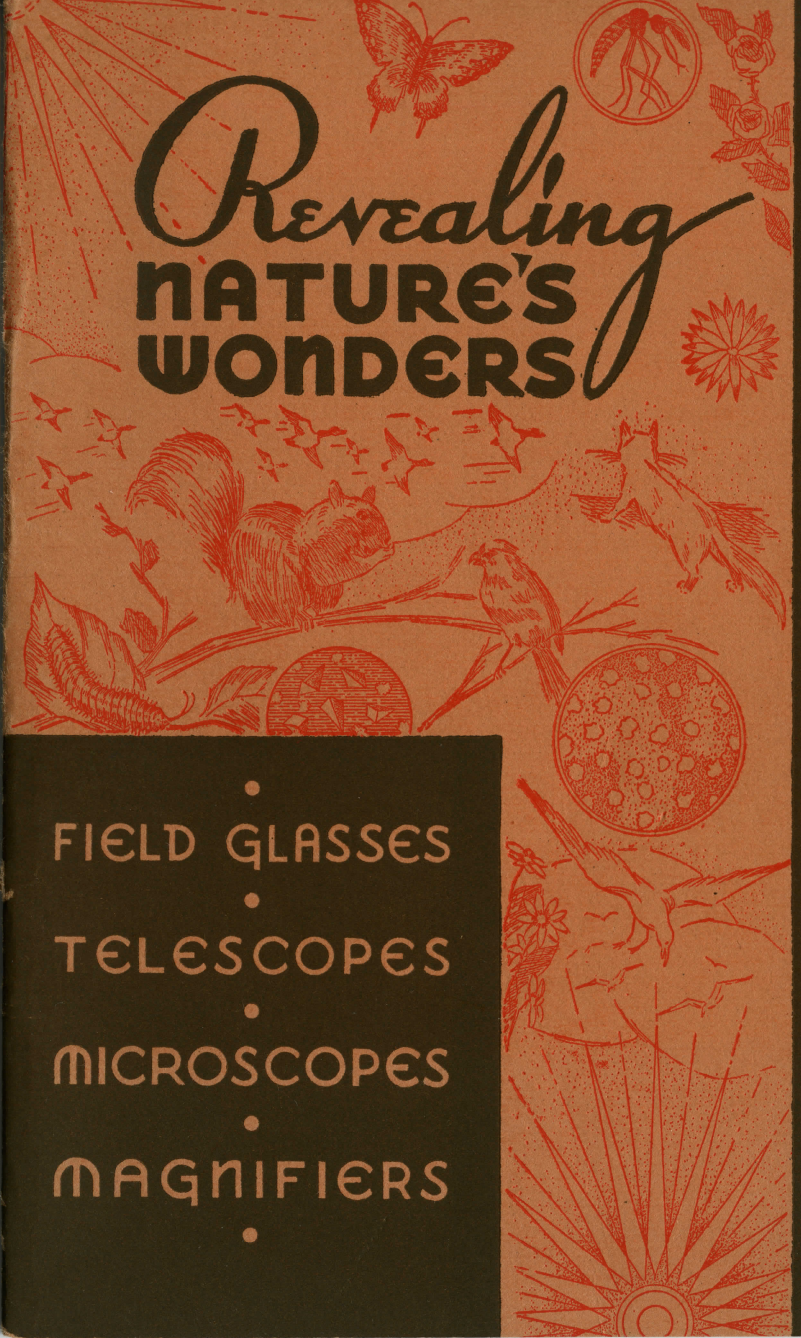
Revealing NATURE'S WONDERS



- FIELD GLASSES
- TELESCOPES
- MICROSCOPES
- MAGNIFIERS

Wollensak Optical Company

Photomicrographs
by Courtesy of
NEW YORK BIOLOGICAL SUPPLY CO.
of NEW YORK

1934

FIELD GLASSES
MICROSCOPES » MAGNIFIERS
TELESCOPES

CATALOG No. 10

WOLLENSAK OPTICAL COMPANY
ROCHESTER, NEW YORK, U. S. A.
(In Business Since 1899)

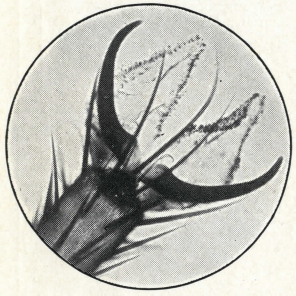
WOLLENSAK MICROSCOPES

THEIR WHYS AND WHEREFORES

NO longer do the amazing revelations of the microscope belong only to the scientific laboratory. Today the hidden structure of fabrics and materials is revealed in manufacturing plants and retail stores at a price so low that a few years ago it would have seemed unbelievable. School students and adults enjoy in their homes the adventurous exploration and breath-taking disclosures of a hidden world even more extensive than the seen world in which we live. The magic of modern manufacturing has made powerful microscopes simple to use, wonderfully penetrating and surprisingly low in cost. There is probably no hobby which retains its fascination for a lifetime and costs so little to gratify as the use of a microscope.

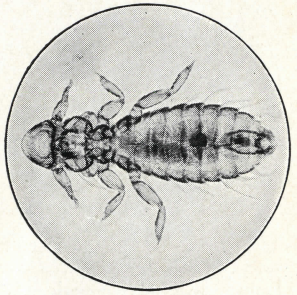
THE EYE TO NATURE'S WONDERS

The interesting subjects that present themselves for microscopic observation are far too numerous to permit of being counted. The most commonplace object, under the microscope, reveals itself as a world of startling beauty or oddity that would never be even suspected by the naked eye. Ponds, creeks, dried fruits, low-growing vegetables, grasses, leaves and scores of other sources conceal literally thousands of infinitely small living creatures that bring astonishment under microscopic examination; the slime under the common lily pads, for instance, when magnified reveals a turmoil of battling voracious life of seemingly endless variety. Sea weeds and pond plants, under the microscope, display exquisite patterns unbelievably delicate in their complex structure. And from the seas, sand and marine surroundings we can go to the woods and meadows, examining leaves, bark, moss, fungi, pollen, seeds; everything that we see with the unaided eyes we may expect to become infinitely more



Foot of Housefly

awing in the disclosure of sensitive living creatures that are positively astounding when magnified under the microscope. When enlarged, the common moss becomes a veritable forest in which live tiny insects that can be clearly seen busying themselves with their life's routine of eating, struggling, breeding, dying. Examine a leaf—any leaf—and see the pores through which they breathe and live and remember that those very pores keep you alive, for without leaf and pores there would be no vegetation, and without vegetation there could be no animal life. Study the hairs that grow close to each leaf surface and which hold the moisture that they need for continued existence. A splinter of a decayed log or a tiny drop of ditch water proves to be the stamping grounds for scores of odd shaped, frightful-looking monsters cruel beyond belief to other tiny inhabitants of their crowded world. Everywhere life swarms, and preys on other life, visible to your eyes under the microscope.



Chicken Louse

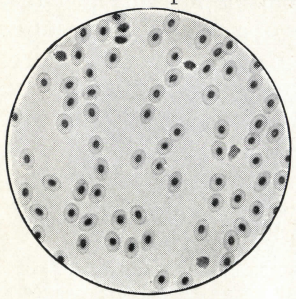
If for any reason your activities are confined indoors or away from the woods or lakes, your microscope adventures need not be curtailed, because in the pantry can be found dozens of splendid subjects; a bit of ordinary onion skin, for instance, shows itself to be a gorgeous area of filigree work; a grain of sugar resembles a glowing chunk of glass. With a razor blade, make tissue-thin slices of apple, carrot, potato or any other vegetable or fruit and treat yourself to an absorbing view of their almost incredibly beautiful lacy structure.

The apparently mysterious antics and habits of insects can best be understood by microscopic examination. What holds the ordinary house fly clinging to the ceiling? How can it walk up a smooth glass window? Just examine a leg of this creature; see the ingenious pair of claws resembling ice tongs, and between these a soft gummy pad for holding the fly to the window pane where the claws fail to serve. See, on the legs, the comb of hairs for dusting powdery dirt from wings; take a look at its eyes, proboscis, wings and you will spend many happy hours. Yes, and likely as not you'll find

small parasites feeding off its body. When the fly has been thoroughly dissected and studied, with new wonders turning up over and over again, turn to some other insect, the bee, spider, ant, etc. Study the jeweled shingles of the butterfly's wings and body, not equalled in beauty by any man-made ornaments.

START A SLIDE LIBRARY

So, you see, the microscope at home offers unlimited possibilities as a source of pastime and education. And as your knowledge in this study increases you will want to start a slide library. Preparing and maintaining a slide library richly enhances this most interesting of studies. This library can be quickly started and easily maintained; there are simple books on this subject that hold interesting and helpful information, which can be had at the public library or book dealers.

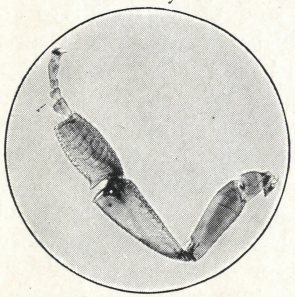


Frog Blood

Aside from its educational value at home, the Wollensak Microscope figures prominently in industrial and scientific laboratories, offices, high schools, on farms, etc. Its compact size makes it particularly suited for field examinations.

THE PRINCIPLE OF THE MICROSCOPE

Almost every one is familiar with magnifiers or hand reading glasses; these, when held between the eye and an object, make the latter appear in large proportions. Now, if with another lens we magnify again the already magnified image of the object, we would have a fair idea of the principle of the microscope. The small lens known as the objective lens at the lower part of the tube gives the initial or primary magnification of the object, and this image is remagnified by the eyepiece or

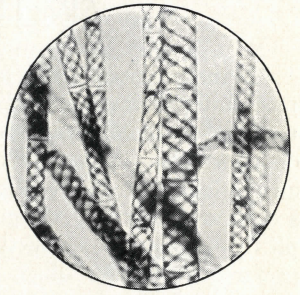


Honey Bee Leg

ocular lens at the top of the tube nearest to the eye, thus producing high magnification that is possible only in instruments with the construction of the microscope. While this sounds very simple, it nevertheless requires extreme precision in mounting and accuracy in grinding, centering and cementing the lenses, to assure perfect alignment and setting of all the lenses, if a clear, color-free and well defined image is to be had. The greater the magnification, the larger will any errors appear to the eye, for the microscope magnifies impartially. Knowing this, the makers of Wollensak Microscopes take special care to provide a reliable optical system. For this reason alone you are justified in having as your microscope a genuine Wollensak.

ABOUT MAGNIFICATION

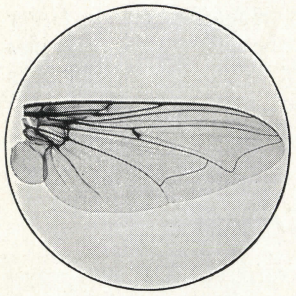
The magnification of a microscope is referred to in two ways. The most generally accepted term to indicate the magnifying power of the instrument, as employed by all experienced microscopists, is "Diameters" or "Power," usually indicated by the letter "X." This term means exactly "*diameter* magnification." For example, if we examine an object that actually measures one hundredth of an inch in diameter and magnify it until it measures one inch across, we have 100 *diameter* magnification or 100-power or 100X. The other method of indicating the magnification and which, because it is deceptive, is least used is "Times" or "Areas." This means the total *area* magnification of the microscope and is the square of the diameter. If, for instance, a microscope gives a magnification of 100 *diameters,* it has a *times* or *area* magnification of 100 multiplied by 100, or 10,000. All Wollensak Microscopes are honestly designated by the scientific method — that is, magnification by *diameters.*



Pond Scum

Selecting a microscope that gives extremely high magnifications is not always a sound practice, especially if it is to be used for gen-

eral purpose work by amateurs. Even professional microscopists seldom find use for the very high powers. The magnification generally used rarely exceeds 400X. Consider a flea's head, for example. If you wish to see the entire head with all the parts in their relative positions, you would be compelled to use the lower powers; higher magnifications would disclose but a *very minute part* of the head. And this applies to thousands of subjects that might be placed under the microscope for observation.



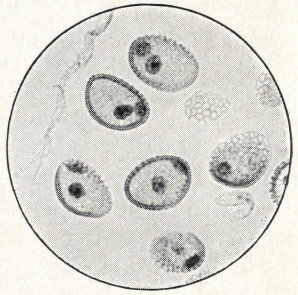
Wing of Housefly

Wollensak Microscopes are so constructed that they give a variable range of magnifications by simply drawing out the length of the optical tube. These tubes are accurately calibrated in steps of 25X and, therefore, eliminate the element of guess in predetermining the powers. We guarantee that Wollensak Microscopes magnify as indicated—another reason why your choice should be a Wollensak.

SIMPLE TO OPERATE

To the uninitiated the microscope may seem like a highly technical and extremely complicated instrument. As a matter of fact, the Wollensak Microscopes are as simple to use as an ordinary pair of binoculars. They can be operated by an intelligent child. Wollensak Microscopes are especially designed for simplicity in use — a third reason for preferring a Wollensak.

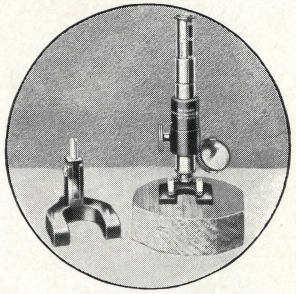
After placing the object or glass slide on the stage (the table-like projection midway on the instrument), the mirror below the stage is adjusted until it reflects the most light up onto the glass slide. The tube containing the optical system is moved up slowly by turning



Pollen of Lily

the focusing knob on the side of the instrument. Easily and quickly the object on the slide is found and sharply defined.

The 150X, 235X and 425X Wollensak Microscopes have detachable bases. This feature is of inestimable value. It permits microscopic examinations of solids and other bulky subjects that are too large to be placed on the stage—mineral specimens, rocks, metals, furniture, watch-mechanisms, shoe leather, etc. Another advantage is that, with the base detached, the microscope can be used to examine objects on glass slides, by pointing the instrument horizontally towards a window or lamp, in the manner of a telescope, thereby eliminating the need of adjusting the mirror. This is especially useful in class study or where several people wish to view each slide.

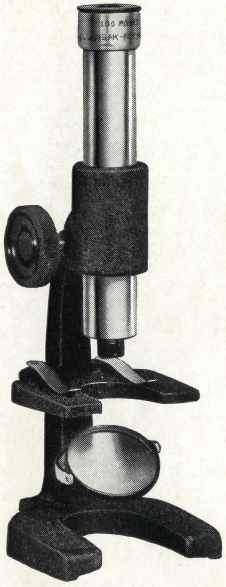


Detachable Base For Examining Solids

PHOTOMICROGRAPHY

Photomicrography—photos made through a microscope—is a fascinating phase of microscopy, preserving for years on the finished print the miracles that every microscope adventurer encounters. Photomicrographs can be made at home by almost anyone, with practically no previous experience, if the instructions which accompany each Wollensak Microscope are followed. Few of the inexpensive Microscopes on the market are suitable for making good photomicrographs, but with the 150X, 235X and 425X Wollensak Microscopes, because they are finely corrected photographically you can make splendid photomicrographs to draw the admiring envy of your friends. Wollensak lenses are achromatic (color-free), of the highest quality and similar to those used in professional photomicrographic equipment.

All that is needed to make photomicrographs is an ordinary camera, the make is not important. It need not have lenses because the optical system of the microscope acts as the photographic lenses in this work.



100 POWER MICROSCOPE

Magnification, 100X
Removable plain mirror
Rack and pinion focusing
One piece moulded stand
Individual spring clips
Stage 1⅞" x 1⅜"
Height collapsed 6½"
Height extended 7⅜"
Rhodium plate and lacquer finish
Two plain glass slides

Price, complete with case, **$5.00**

THAT we are able to offer as fine a microscope as this 100-power model so reasonably is indeed a tribute to Wollensak manufacturing methods. While it does not have the ultra-precise optics and adjustments of the three larger models, it is, nevertheless, a thoroughly dependable instrument that gives a guaranteed magnification of one hundred diameters.

It produces excellent results in examining the hundreds of commonplace objects that are continually presenting themselves about the house and elsewhere, and covers a large area of the specimen clearly and distinctly.

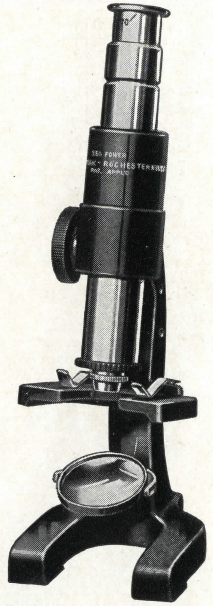
This is a splendid model for the Grade and Junior High School student who wants to become acquainted with the interesting study and pastime that is afforded by microscopy before investing in a finer or more expensive instrument. In general appearance and manipulation it is a microscope that any youngster should be proud of owning, and represents wonderful value at the price.

150 POWER MICROSCOPE

Single, achromatic objective lens, photographically corrected
Magnifications, 70X to 150X, graduated in steps of 25X
Removable concave mirror
Rack and pinion focusing
Tilted stand, not adjustable
Detachable base
Stage 1 7/16" x 2"
Height collapsed 6⅝"
Height fully extended 11⅛"
Rhodium plate and black lacquer finish
One pair of tweezers
Two plain glass slides
One prepared slide
Lacquered wood case

Price, Complete, **$12.50**

High Power Eyepiece to increase power to 225X, including case, **$3.50**

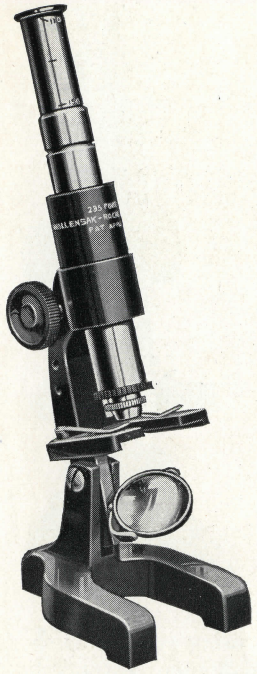


HAVING the same precise optical and focusing systems as the higher power models, this instrument will serve for microscopic studies with the exactness of more professional types where high magnifications are not required. Like other Wollensak Microscopes, it is guaranteed to magnify as indicated and has the full range of powers accurately calibrated for determination in advance.

With the base detached, bulky objects too large for placing on the stage can be examined. It also enables objects on slides to be viewed by holding the instrument towards a window in the manner of a telescope.

This instrument, like the higher power models, is corrected for making photomicrographs and is furnished with complete instructions covering this delightful phase of microscopy.

The high power eyepiece increases the magnification to 225X, permits closer examination of tiny parts of specimens, and reveals objects that may not otherwise be seen.



235 POWER MICROSCOPE

Single, achromatic objective lens, photographically corrected
Magnifications, 110X to 235X, graduated in steps of 25X
Removable concave mirror
Rack and pinion focusing
Adjustable stand, tilts to all positions
Detachable base
Stage 1 7/16″ x 2″
Height collapsed 6⅞″
Height fully extended 11 9/16″
Rhodium plate and black lacquer finish
One pair tweezers
Two plain glass slides
One prepared slide
Lacquered wood case

Price, Complete, **$15.50**

Low power eyepiece to reduce magnification to 65X, including case, **$3.50**

MANY branches of biological work require a microscope with a magnification not exceeding 200 to 250X, and it is to this group that the 235X Microscope will appeal.

Wollensak Microscopes are recognized for excellence in optics, compactness and maximum efficiency. This model with its tilting stand and detachable base, makes a very flexible instrument for many forms of microscopic examinations. It is also splendidly adapted for photomicrography, because of the fine achromatic optical system not found in most other makes of student microscopes.

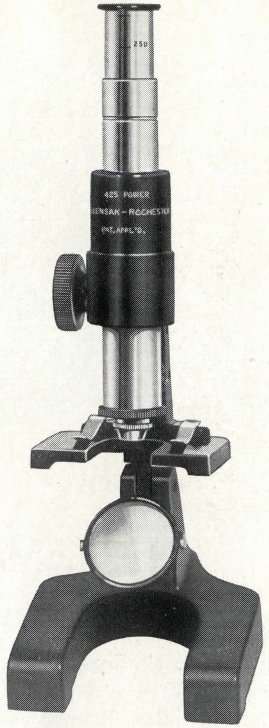
The minimum magnification available with this 235X microscope is 110 diameters. To take care of some studies that require lower magnifications, the low power eyepiece makes a splendid addition. Replacing the regular eyepiece with this low power eyepiece will bring the magnification down to 65X.

425 POWER MICROSCOPE

Double, achromatic objective lenses, photographically corrected.
Magnifications, 100X to 425X, graduated in steps of 25X
Removable concave mirror
Rack and pinion focusing
Adjustable stand, tilts to all positions
Detachable base
Stage 1 11/16″ x 2¼″
Height collapsed 7″
Height fully extended 11¾″
Rhodium plate and black lacquer finish
One pair of tweezers
Two plain glass slides
One prepared slide
Lacquered wood case

Price, Complete, **$18.50**

Low Power Eyepiece to reduce power to 65X, including case, **$3.50**



THIS Wollensak Microscope possesses sufficient magnification and precision for the general run of microscopic work for laboratories, physicians, colleges, high schools, offices and homes.

The magnifications are guaranteed to be correct, and can be determined in advance by setting the tubes to the calibrated scale. By detaching the base, the upper portion containing the optical system can be placed on subjects too large to be laid on the stage.

The optical system is of fine quality, especially corrected to produce splendid photos and sharply defined images for the eye. Making photomicrographs is a real joy and can be attained by everyone, instructions for making them are furnished with each Wollensak Microscope. This is not possible with all makes.

A low power eyepiece greatly broadens the use of this instrument; it permits a larger area of the specimen to be examined and, in such cases, brings a greater depth of the object into sharp focus.

THE ELEMENTARY SLIDE SET

MATERIAL for microscopic slide making is a necessary adjunct to any microscope, if the maximum lasting enjoyment and value from the instrument is expected. Preparing and maintaining a slide library is a fascinating pastime that can be suspended any time and later resumed at leisure. While a slide library involves practically no expense, it is of never-ending interest and provides an enjoyable means of displaying to visitors at will the marvelous details of the minute life which exists all about us and yet which to most people is a profound mystery.

Plant life, insects, feathers, hair, vegetable matter, fish scales and thousands of other objects present themselves as intensely desirable for permanent preservation. These can be mounted at home with practically no previous experience; it is made very simple with the details and equipment that accompany the Wollensak Slide Set.

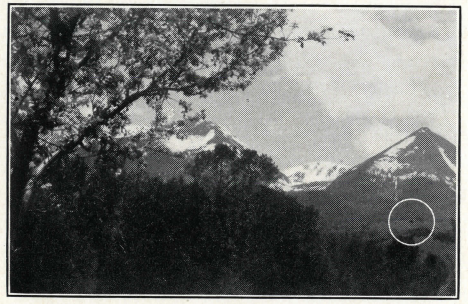
Ten assorted prepared glass slides containing subjects in botany, zoology, physiology, etc.; ten plain glass slides and cover glasses; two dissecting needles; one pair of tweezers; one medicine dropper; one tube Canada balsam; ten slide wrappers; one vial of xylol; one vial of alcohol; one collecting box; one preserving jar; one slide cover box; complete instructions; packed in an attractive box. Price, **$3.50.**

WOLLENSAK
FIELD GLASSES AND TELESCOPES
TO SEE ALL THERE IS TO SEE

FIELD glasses and telescopes are the means of increasing our distance vision to the fullest. Field glasses are rapidly establishing themselves as permanent and necessary pieces of equipment with the sportsman, the naturalist, the motorist and the traveler, because instruments of this character are a much-envied means of furthering enjoyment. Of telescopes it has been said that no device within the reach of mankind so deeply arouses the overpowering sense of religious awe, revealing as they do the inexplicable order and design of the universe.

ABOUT POWER

Field glasses and telescopes reduce apparent distance and magnify far-off objects by the equivalent of their power. For example, if, on some clear day, you are standing on the shore and spot a ship miles at sea, perhaps on the horizon, it may appear about a foot long and of course indistinguishable. A six power glass will make that ship appear six times closer and six feet long. Put a twenty-five power telescope to your eye and the ship will seem twenty-five feet long and twenty-five times closer.



WHY A TELESCOPE?

The reasons for telescopes are many, but the chief reason is that we are able to incorporate high magnifications in an instrument of this type at much lower cost than in a binocular. This places the telescope in a price class within the reach of many who could not possibly own a high power binocular and yet can derive the enjoyment expected from using such an instrument.

A telescope because of its high power is unequaled for many purposes. On the rifle range for instance, it easily locates the bullet holes in the target from the firing line. At the mountain resort or country home, people, animals, races and many other interesting objects and sports can be viewed with comfort from the veranda where even binoculars would not serve. Under favorable conditions a high power Wollensak telescope if trained skyward, will give an enchanting close-up of the heavenly bodies, with hours of endless fun and thrilling discoveries.

These instruments enable us to see farther and see more, with greater clarity and without eyestrain.

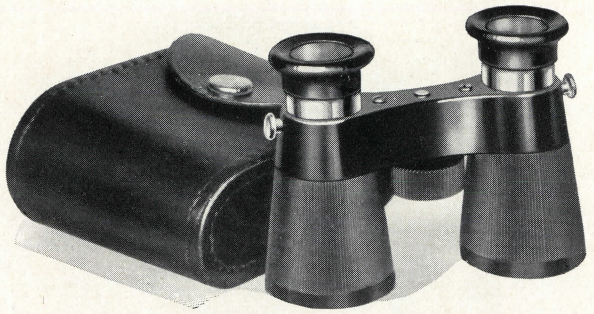
THE ACHROMATIC FEATURE

At some time or other you may have looked through a field glass or telescope and noticed objectionable color-fringes outlining the object that you were viewing. That defect is known as chromatic aberration (uncorrected for color) and is usually found in cheaper instruments. Such instruments also have a very narrow field of view; that is, they cover a small area only. Objects at the edge of the glass appear very fuzzy or indistinct. Wollensak Field Glasses and Telescopes have achromatic (color-free) lenses that produce the entire view clearly as in nature, without distortion and without color-fringes around the edges. Wollensak achromatic instruments also have more lenses and give a much wider field of vision than uncorrected instruments.

6X BIASCOPE

A LIGHT-WEIGHT six-power field glass for hunting, fishing, hiking, motoring, sailing or any place out of doors. It has an excellent achromatic optical system that gives a large, clear field of view, free from objectionable color fringes. It has the quickest one finger focusing device known and because of its compact size, it fits comfortably in the coat pocket. Made in six colors: Black, Oak, Mahogany, Green, Mottled Orange and Black, or Mottled Red and Black. Supplied with genuine leather case. Thousands are in satisfactory use everywhere by owners who are enthusiastic over this unusually fine glass at its popular price.

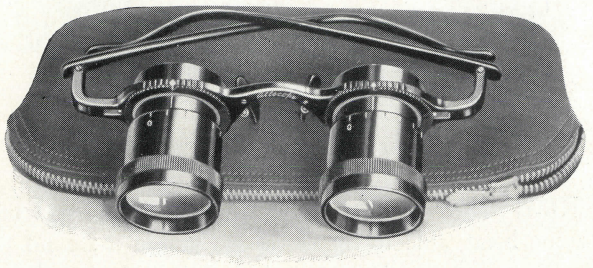
Magnification	6-power
Diameter of objective lens	1″
Height closed	3 11/32″
Height extended	3 9/16″
Width	3¾″
Thickness	1 9/32″
Weight	4½ oz.
Price	**$5.00**



4X COMMANDER

THIS field glass is especially recommended for general field use, bird study and sporting events, where medium power and wide field of view are required. It has an excellent optical system that gives the exceptional field of view of 300 feet at a distance of 1000 yards. Fits all eyes; no pupillary adjustment necessary. Center screw focusing. Very light weight and durably constructed. Furnished with genuine stiff leather case and neck strap. In our opinion more than 50% of all field glass users would find the Wollensak 4X Commander better suited to their needs and pocketbooks than any other glass known to the market.

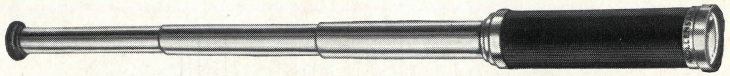
Magnification	4-power
Diameter of objective lens	1⅜"
Height closed	2 15/16"
Height extended	3 3/16"
Width	4 1/16"
Thickness	1 21/32"
Weight	7 oz.
Price	**$12.50**



ALLSCOPE

THE favorite glass for viewing all sporting events such as boxing, baseball, racing, etc., as well as for the theater. The Allscope is really just a pair of telescope spectacles, ingeniously designed to avoid excessive weight and inconvenience. It slips on and off the face as easily as a pair of glasses. The temples and nose pads are quickly shaped to fit the face comfortably, gracefully and securely, and the lenses, adjustable to all eye widths, are individually focused. Because of its exceptionally wide vision, the Allscope enables every play to be seen, with remarkably clear view and comforting freedom from eyestrain. It is handsomely and durably finished, light in weight and supplied with genuine leather case with zipper fastener. While the Allscope is a comparatively new optical instrument it is rapidly becoming widely popular because it so enormously increases the pleasure of the user at all outdoor and indoor sporting events. In effect it places you right in the center of action.

	Price
Model A Allscope, 2 power	**$12.50**
Model B Allscope, 3¼ power	**$14.50**



ACHROMATIC TELESCOPES

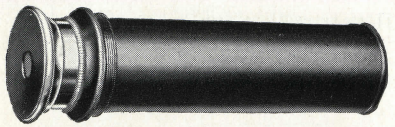
THERE is something exceedingly fascinating about a telescope. Imagine being able to fly anywhere within a second. A telescope gives you almost that magical sensation. It, in effect, carries your eye to distant mountains, aboard far-away ships and miles down the roads and valleys. It materially adds to the enjoyment of the occasion by excluding from view all irrelevant objects and largely magnifying into detailed clearness the center of attention. Wollensak Telescopes have excellent achromatic optics and cover a wide field of view with crispy sharpness. The precision with which the lenses are produced and mounted eliminates color-fringes and eyestrain.

Rhodium-plated draw tubes and attractive ribbed vulcanized fibre body assure permanence and durability. The smooth acting, true fitting tubes permit quick focusing and perfect alignment at all times. Packed in sturdy, waterproof case.

Power	Diameter of Objective	Length Extended	Length Closed	Draw Tubes	Field of View at 1000 yds.	Weight	Price
10X	7/8"	14¾"	5⅜"	3	33 yds.	6 oz.	**$ 6.00**
15X	1¼"	18⅝"	6½"	3	25 yds.	12 oz..	**$ 8.50**
20X	1 7/16"	24⅞"	8"	3	21 yds.	15 oz.	**$10.50**
25X	1 11/16"	30½"	9"	4	17 yds.	26 oz.	**$15.00**
35X	2"	38"	10⅞"	4	15 yds.	40 oz.	**$32.50**
*45X	2¼"	48"	12½"	4	13 yds.	60 oz.	**$42.50**

* When used with celestial eyepiece, magnification is 68X.

DARK GLASS FILTER: for solar observation. Supplied in mount ready to fit all Wollensak telescopes. **$2.50.**

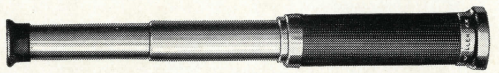


CELESTIAL EYEPIECE

Picture your delight and wonder when you first view the belts of Jupiter, the rings of Saturn, the ice-capped poles of Mars, and sweep the limitless depths of space to gaze in silent rapture at the mighty works of the Creator. Never did human voice preach a sermon so soul-stirring as that. The Wollensak 45X Telescope, with Celestial Eyepiece added, brings you into intimate contact with miracles beyond the power of mind to grasp. This Celestial Eyepiece designed for the 45X Telescope only, increases the magnification to 68X for astronomical work. Not suitable for terrestrial use. Supplied with sun glass for solar observations and furnished in mount ready to interchange with standard eyepiece lens. Price **$9.25**

TELESCOPE CLAMP

Ingeniously designed to hold any Wollensak Telescope and should be included in every telescope kit, especially with the higher power instruments. It has both panoramic and elevating movements and can be screwed to any camera tripod. Constructed of brass, chromium plated. Price **$7.50**



6X ACHROMATIC TELESCOPE

Here is the greatest value ever produced. The high grade optical system is achromatic and produces vision clear as in nature, no edge blur or rainbow fringes to impede sight. Magnification 6X. Width of field at 1000 yards—156 feet. Draw tubes brilliantly nickeled; body of indestructible fiber. Supplied with genuine leather case.

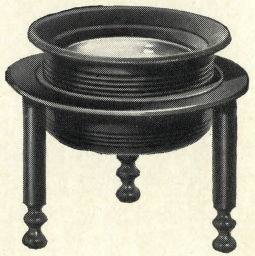
Diameter of objective lens	7/8"	Diameter	1¼"
Length closed	4½"	Weight	3½ oz.
Length extended	9¼"	Price each	**$2.50**

POCKESCOPE

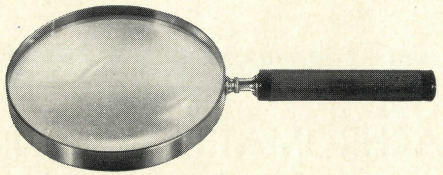
A compact telescope designed for pocket use. Not much larger than a jackknife but a real telescope and a leader in its class. Precision lenses, black lacquered barrel and nickel-plated draw tubes. Furnished with genuine leather case.

	Power	Length Closed	Length Extended	Diameter	Price
Pockescope Jr.	3X	2 5/8"	3 5/16"	3/4"	**$1.00**
Pockescope Sr.	6X	3 1/4"	3 9/16"	1 3/16"	**$2.00**

TRIPOD MAGNIFIER



A handy magnifier for school, home, office and field use. Makes an excellent glass for stamp and coin collectors; for finger-print work, biological dissecting and hundreds of other uses. Fine lenses give the Wollensak Tripod Magnifier good illumination and clear definition over its entire field. Mounted in substantial stand with screw focusing mount. Magnification 7 1/2X. Price **$.75.**



READING GLASSES

Made of fine clear glass, optically ground and polished, assuring fine vision without objectionable color-fringes. Fitted into highly polished Rhodium frame with attractive vulcanized fiber handle.

2 1/2" diameter	**$1.75**	3 1/2" diameter	**$2.25**
3" diameter	**$2.00**	4" diameter	**$2.75**
5" diameter	**$4.00**		

PRINTED IN U. S. A. 2-34

Guarantee

ORDER any Wollensak product in perfect confidence. Try them a day or so. If unsatisfactory for any reason, return the instrument and your money will be refunded in full. All Wollensak instruments are guaranteed to give satisfactory performance, breakage or abuse of course excepted.