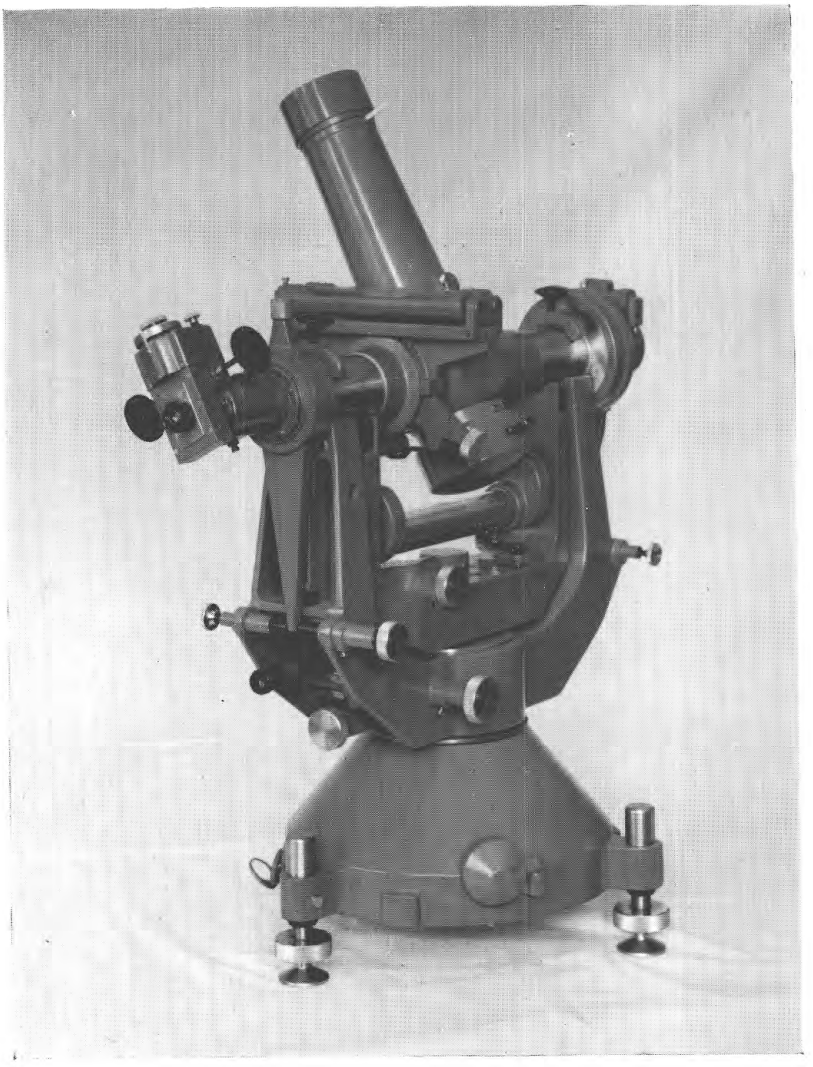

THE WILD "ASTRONOMICAL" THEODOLITE

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A NEW THEODOLITE BY WILD

PARTICULARS have recently been received of a new theodolite by Wild & Co., and, although this is hardly the time when many readers will be thinking of purchasing scientific instruments from abroad, any new production of this well-known Swiss firm is always of interest from a technical point of view. Moreover, this new instrument embodies in its design the rather unusual combination of the main features of a broken telescope transit instrument with those of a theodolite for reading horizontal and vertical angles. Accordingly, it is thought that a short description of it will be of interest to many surveyors.

The theodolite, which is numbered T4, is primarily designed for accurate astronomical work, as, in addition to the broken telescope often used in astronomical transit instruments, it is fitted with special sensitive levels for observing latitude by the Horrebow-Talcott method and with an impersonal eyepiece micrometer which can be rotated through 90° between stops, so that it can be used with the hairs either in a vertical or horizontal position. Another interesting feature is a special hydraulic arrangement, actuated by a lever, for reversing the horizontal axis and telescope in their supports. It is stated in the specification that this reversal is made without vibration.

The diameter of the objective of the telescope is 60 mm., or 2·4 inches, which is the same as in the ordinary Wild geodetic theodolite No. T3, and the magnification with the eyepiece provided is 65 diameters. Electrical illumination is fitted for lighting the telescope diaphragm and also for reading the horizontal and vertical micrometers. If necessary, the circles can be read in daylight, as mirrors to reflect the light into the micrometers are provided.

The horizontal circle is of glass and is 10 inches in diameter, which is about double the diameter of the ordinary geodetic model. The division interval is 2′ of arc and readings can be taken direct to 0″·1 by means of an optical micrometer that gives automatically the mean of the readings at the two ends of the diameter. The main vertical circle, also of glass, is $3\frac{1}{2}$ inches diameter, with a graduation interval of 20′, and can be read direct to 1″ by means of a single optical micrometer, which, of course, gives the mean of the readings at the two ends of a diameter. Another smaller vertical circle is fitted for rapid sighting and for finding a star. This circle is made of glass and is graduated to 1° intervals which can be read to 1′ of arc by means of a micrometer.

The two Horrebow levels for latitude observations have a sensitivity of 1″ per 2 mm. run, and the coincidence level fitted to the main vertical circle has a sensitivity of 5″ per 2 mm. run. A level is also fitted to the smaller vertical circle, and this is sensitive to 1° per 2 mm. run. All levels are protected by tubes of specially

transparent material, and the length of the bubble can be adjusted as desired.

The instrument is intended for use on a concrete pillar, but a strong wooden stand is provided if specially asked for.

The makers claim that, in spite of being primarily designed for astronomical work, the theodolite is suitable in every way for primary triangulation. The total weight, complete with case, is 100 kilogrammes or 220 lbs.

The following is a comparison of the specifications of the ordinary Wild geodetic theodolite T3 and of the astronomical theodolite T4:—

	Wild Precision T3 Theodolite	Astronomical Theodolite T4
Diameter of Horizontal Circle	5·5 ins.	10 ins.
Graduation Interval	4′	2′
Direct Reading	0″·2	0″·1
Diameter of Vertical Circle	3·8 ins.	3·5 ins.
Graduation Interval	8′	20′
Direct Reading	0″·2	1″
Clear Aperture of Object Glass	2·4 ins.	2·4 ins.
Magnification of Telescope	24, 30, 40 ×	65 ×
Sensitivity of Horizontal Level	7″ per 2 mm.	1″ per 2 mm.
,, of Vertical Circle Level	12″ per 2 mm.	5″ per 2 mm.
,, of Horrebow Level	..	1″ per 2 mm.
Weight of Instrument in Case	33 lbs.	220 lbs.