NOTE ON A CONVENIENT FORM OF POLARIMETER FOR EXAMINING ESSENTIAL OILS.

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IN the chemical and physical examination of many of the essential oils in use for flavouring purposes, the rapid determination of the specific gravity and optical rotation of the sample greatly facilitates the forming of an opinion as to purity, and not infrequently obviates the necessity of an elaborate chemical analysis. But the ordinary appliances of these determinations are cumbrous and costly. For the specific gravity, however, it is now possible to obtain a very inexpensive and sufficiently accurate plummet-balance, after the fashion of the Westphal, but much cheaper, and just as good. Until recently I have not found a really satisfactory and inexpensive polarimetric instrument, however. After trying various polarimeters, I found that E. Leitz, of Wetzlar, had devised a very beautiful little instrument intended for pathogenic work in the testing of diabetic urine and similar matters. It seemed to me that this possessed so many advantages over the larger and more costly instruments that I made a number of experiments with it. It seemed, however, that the original form of the apparatus was too restricted as to the scale for work of the class I required, since the rotation of some oils is very high. I therefore communicated with the maker (through his London agents, Messrs. C. Baker, of 244, High Holborn), and ultimately obtained an instrument with a complete divided circle. This is as perfectly constructed as any I have ever seen, and the arrangement for rotation and reading of the scale is very convenient indeed. One special advantage of the instrument is that it can be inclined at any angle and used with ordinary light. A polarimeter requiring monochromatic light is, in many small laboratories, a great inconvenience. The description of the optical and mechanical arrangements, given by the maker, is briefly as follows: The improved Mitscherlich consists of two Nicol prisms, between which the object-tube is fitted. The polarizer is fitted upright. Behind the polarizer is the bi-quartz plate, turning to right and left. The analyser, with a vernier attached on a radial arm, traverses the divisions on a circular plate by means of an endless screw. A small movable mirror illuminates the apparatus, and therefore the latter can be brought into any position for comfortable working. The vertical crossed position (*viz.*, entire darkening of the visual field) corresponds to the zero-point. As this position cannot be again obtained after the introduction of an optically active substance, because of the rotation of the latter, the colour—violet—has been chosen as the end-point; the transition of this colour into blue on the one side and into red on the other can be observed most exactly. The range of prismatic colours is seen to be repeated on turning. As long as blue is seen the vernier has not passed far enough; but when red is seen it has passed too far. The eye-piece is movable, and can be focussed exactly on the bi-quartz plate. The particular fraction of a degree that can be read depends on the experience and colour-sensitiveness of the operator. There is a convenient arrangement for adjusting the

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zero-point, and although, of course, there is a personal factor in all these observations, I have found it easy to read to one-tenth of a degree with this instrument. I strongly recommend it to those who have occasion to do work of this class.