the fresh fish sold on the Winnipeg market comes from this lake.

A full report of my investigations will be published shortly.

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SCIENTIFIC BOOKS

Crystallographic Tables for the Determination of Minerals. By VICTOR GOLDSCHMIDT (Heidelberg) and SAMUEL G. GORDON (Philadelphia). Philadelphia, Pa., Special Publication No. 2, The Academy of Natural Sciences of Philadelphia, 77 pp., 4 figs., 16 tables, 1928.

THIS is a complete presentation of the most modern methods of dealing with crystal identification by means of two-circle goniometric measurements. In earlier days Professor Federov, of Petrograd, Russia, wrote a "Dictionary of the Mineral Kingdom," which has been published by the Petrograd Academy of Science. This work is a sort of crystallo-chemical analysis of over ten thousand compounds, both organic and inorganic, which had been previously investigated as to crystallographic details; but unfortunately it is much involved with Ferderdov's theories of crystal structure.

The present work is intended for treatment of the unknown crystal which has been measured on the two-circle goniometer. It is very concise. First, it is necessary to identify the crystal system to which the unknown crystal belongs; then its complete identification is accomplished by means of the angles and polar elements as given in the tables. These tables are especially useful because any normal orientation of the crystal will give sufficient data for identification.

Since isometric crystals can not be distinguished from one another by crystal measurement, they are arranged according to luster, then by chemical composition, and lastly according to increasing specific gravity. The tetragonal minerals are arranged according to tangent relations, orientation with reference to either first or second order prism position being allowed for. For the orthorhombic crystals we may use either the linear or polar elements, the tangent or the cotangent. In this connection a supplementary table (Table 7) is used to make the work more complete for every possible orientation. Monoclinic minerals are classified according to prism angles and tangents of these, since the prism zone usually can readily be identified. Triclinic crystals are listed according to projection elements, polar elements and linear elements, and a special table is also provided to aid in correct orientation.

In every table there are cross references to other tables. The index at the end of the book refers directly to the minerals, of which a total of 1,710 species are listed. The book should be very useful to crystallographers in general.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

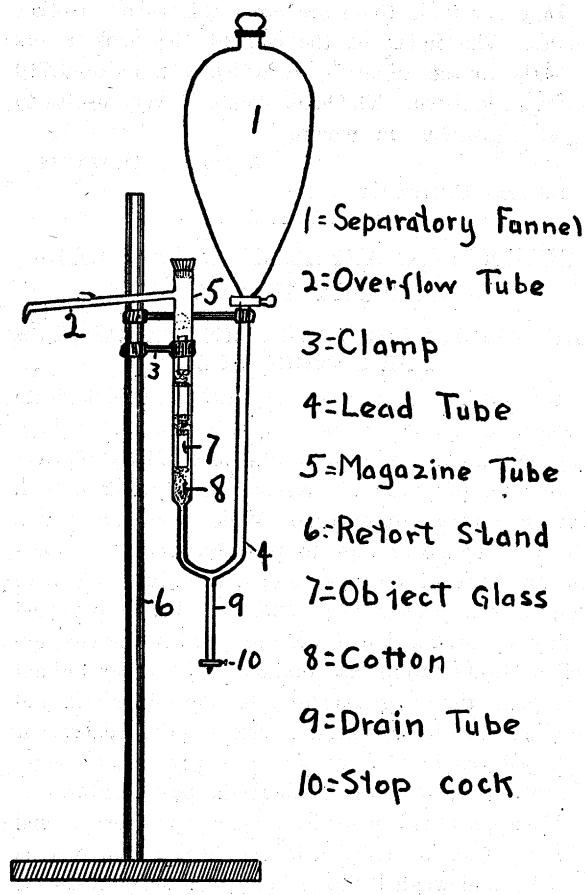
AN EFFICIENT DEHYDRATING APPARATUS FOR GENERAL USE[1]

SOME animal tissues are very difficult to dehydrate without disastrous shrinkage, which is due to sudden changes in alcoholic concentration. Many devices have been prepared to overcome this problem, with various degrees of success. While searching for a method which was easy to procure, simple to operate and sure of positive results, the apparatus here figured has proved very efficient. While designed especially for the dehydration of plant nematodes, excellent results were also obtained with other animal and plant tissues preparatory to embedding and sectioning. As its application seems quite general, it is hoped that its use may prove as beneficial to workers in other fields as it has here the past months.

The apparatus is made by using a separatory funnel (1) to which is welded a lead tube which in turn is bent up and welded into the end of a small test-tube (5), thus formed into the magazine tube. Near the top of the test-tube is inserted the overflow tube (2), which is bent down and drawn out at its end. It will be noted that the insertion of this tube is on a level, or a bit above, with the stop-cock of the separatory funnel, so the apparatus can not run dry. The unattached end of the magazine tube is left open for ease of loading and unloading of material to be dehydrated. Evaporation is minimized by placing a cork in this open end. At the bottom of the bend in the lead tube, a drain tube (9) is welded in, which is fitted at its open end with a glass stop-cock. This allows for quick and complete drainage when an entire change of fluids is desired. All rubber connections are avoided, so there would be no difficulty when such fluids as xylol are to be used. The glass used is Pyrex, due to the fact that soft glass is hard to manipulate, especially in burning the necessary holes through the magazine.[1]

As used by the author, the entire apparatus is mounted on a ring stand by using suitable clamps

[1] The author is indebted to Mr. George Pettengill, of the Oregon State Agricultural College, department of chemistry, who made many valuable suggestions and did the glass work for the apparatus.



and filled with the appropriate fluid. A small piece of absorbent cotton was placed at the bottom of the magazine tube for the lower object-glass to rest on, and also to aid in gradual change in the strength of fluids. The object-glasses are made in the usual way, by selecting a piece of glass tubing a bit smaller in diameter than that of the magazine tube, and cutting into suitable lengths. The ends of the object-glasses were prepared in either of two ways. When the object-glasses were of small diameter, *i.e.*, to be used for very small objects, they were fitted with glass tube-stoppers which had a bit of bolting-cloth stretched across the inner open end. If the object-glasses were of larger diameter, *i.e.*, to be used for larger objects, the ends were heated and slightly flanged so that cheese-cloth, or cloth of suitable mesh, could be tied over the ends. Inside each object-glass a small bit of paper was placed with the record written in waterproof India ink.

The prepared object-glasses were then placed in the magazine tube, one on top of the other. With larger tissues the magazine tube was often filled with small cheesecloth bags, each bag containing the desired tissues and label. The stop-cock of the separatory funnel was then turned so that the fluid passed through the tissues, out the overflow tube and into a dish. The passage of fluid can be controlled so that any amount passes through—from a few cc per day to liters. The dilutions varied 10 per cent., from water to absolute alcohol, and the time of immersion in each dilution was the same. These two factors being constant, the dehydration rate was very gradual, with a minimum of shrinkage of the tissues.

The change of xylol for objects to be mounted in gums, dissolved in that medium or to be imbedded in paraffin, was made a gradual one by using similar methods. The strengths of xylol in absolute alcohol were 10, 25, 50, 75 and 100 per cent.

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IMMOBILIZATION OF PARAMECIUM

VARIOUS methods have been suggested from time to time for the immobilization of active ciliates for the purposes of study.

In some recent preliminary experiments on Paramecium with ultra-violet radiation it was observed that cultures of this infusorian, exposed in small embryological dishes filled to a depth of 0.5 cms, were in some cases immobilized to such an extent as to permit of detailed study of ciliary activity, vacuole contraction and formation and the general activities of the organism.

The apparatus employed was an ordinary quartz mercury vapor-lamp, DC voltage 90, current 3–4 amperes. The cultures were placed at a distance of 10 cms from the source of light and exposed for a period of eight minutes.

After one such exposure, the result seemed to offer possibilities for rapidly securing immobilization of Paramecium for class study, and so four other cultures were similarly treated with identical results. This simple procedure may prove a satisfactory means of immobilizing this much-used infusorian for class study.

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A BURETTE CLEANER

I HAVE used a burette cleaner for ten years, but have never seen the method explained in print. In school-work, where there are anywhere from one hundred to one thousand burettes in use during the year, often we find several which will not clean up with chromic acid. After trying chromic acid, which is oxidizing in nature, the burette will become clean very easily if the following method is used: