Laboratory Note

J. Appl. Cryst. (1974). **7**, 312

A simple ball-drilling rig

A simple drilling rig is described for boring non-standard holes when the Beevers system of model-making is used.

Beevers (1970) has described an extremely useful 1 cm=1 Å molecular modelling system. Balls with standard drillings are readily available from Dr Beevers and when these are used to assemble molecular models, it is sometimes necessary to use non-standard holes, *e.g.*, for support rods, for strained systems, for portraying unit cells, *etc.*

A drawing of the device is shown in Fig. 1. The rig consists essentially of two lengths of box-section extruded aluminum, 1 and 2. In the shorter section, 1, is clamped a small electric drill, 3, which can be obtained from model-making suppliers. The clamp is such that the motor may be aligned and centred with respect to the orienting device. Two side plates, 4, provide a track for the top section to slide along and a small bolt, 5 (not shown), projecting through an elongated hole, serves both to hold the two aluminum sections together and to limit the travel of the drill. Lubrication with a viscous oil ensures smooth action. A hole is drilled perpendicular to the drilling direction right through the longer section, 2. It is countersunk at both ends to provide conical bearings for one of the ball orientation axes. A countersunk screw together with the turned and tapped component, 6, extending through 2, provide a rotatable member that can be adjusted to remove play, then locked with a locknut. Part 6 also provides a mount for a three-inch diameter plastic protractor, 7, and the block, 8, which carries the second adjustment axis. A hole through this block, at right angles to the axis of 6, is countersunk at either end to provide conical bearings for a shaft. At one end, this shaft is threaded to accept an adjustable bearing block a second protractor and a locknut. At the other, it is drilled coaxially with a 1 mm hole and is countersunk to provide a conical seating so that a standard 6·9 mm diameter ball located in it will have its centre at the centre of the system. This assists in holding balls by hand for drilling initial holes. Subsequently, balls may be held by a 'bond' clamped in the 1 mm hole.

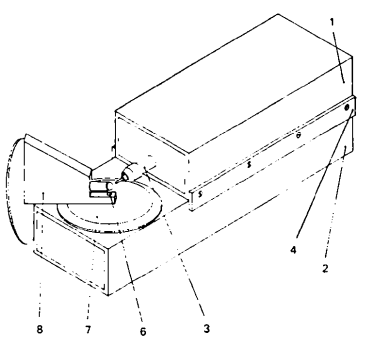

Fig. 1. A perspective view of the ball drilling rig.

The device was made using only hand tools, a drilling machine and a rudimentary lathe. It was found to be adequately rigid and accurate. By setting the correct length of drill protruding from the chuck, drilling to a preset depth is possible.

While it is tedious for one to build a full model using such a rig, it is a useful tool in conjunction with a set of balls having standard drillings as supplied by Dr Beevers.

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Reference

Beevers, C. A. (1970), *J. Appl. Cryst.* **3**, 45–49.

Meeting Report

The First European Crystallographic Meeting. Bordeaux, September 5-8, 1973.

The trend towards international collaboration in Europe found its expression in crystallography last month through the First European Crystallographic Meeting organized by the European Committee of Crystallography under the presidency of Professor Authier and attended by an estimated 500 persons. The conference was organized around two main topics: 'Molecular Interactions' and 'Accurate Determination of Electron Densities'. The topics were emphasized through a series of eight plenary lectures, six of which dealt with molecular interactions (G. S. Pawley, J. D. Dunitz, A. Novak, A. Kitaigorodskii, E. Giglio and S. Lifson), one with electron densities (P. Coppens), while a final lecture was given on protein crystallography (R. Huber).

In the first group Pawley (Edinburgh) emphasized the importance of the study of molecules in motion and illustrated his lecture with results of inelastic scattering studies on orthorhombic sulfur from which molecular distortions can be calculated which agree very well with observations. Dunitz (Zürich) showed how the study of many static systems in the crystalline state can give information on molecular deformations along the coordinate of a chemical reaction such as the nucleophilic addition of a tertiary amine nitrogen to ketone carbonyl groups. Novak (Paris) presented a detailed comparison of infrared and Raman spectra with crystallographic information on hydrogen bonding in solids. Kitaigorodskii (Moscow) emphasized the importance of solid solutions and the application of the non-bonded interaction functions to these systems. He also proposed a new quickly evaluated equation according to which the value of a theory V is equal to the (number of predicted values/number of parameters) − 1. Giglio (Rome) described the determination of molecular packing by potential energy calculations with semi-empirical potential functions for intermolecular interactions. Lifson (Rehovoth) talked on the consistent fitting of a large body of experimental information on hydrocarbons, including unit-cell parameters, heats of sublimation, molecular and lattice vibrations, thermal expansion and enthalpy differences with a set of energy functions.

The lecture in the second group by Coppens (Buffalo) analyzed the theoretical and experimental knowledge of electron densities in molecules and crystals and defined the aims of such studies as the testing of theoretical methods, the elucidation of the electronic structure of large molecules, the derivation of unbiased parameters from X-ray intensities, the study of intermolecular interactions and the measurement of derived physical properties. Finally, the lecture by Huber (Munich) described recent results on the structure of the complex between the pancreatic trypsin inhibitor and trypsin.

The meeting was further enlivened by a great many contributed papers which were impressive by their variety, multitude and generally high quality. Unfortunately, owing to the short duration of

the meeting (three working days) little time was allotted to each paper and three simultaneous sessions had to be organized, with typically six papers in a 75 minute session. Most chairmen used about half the allotted time for short presentations and the remainder for discussion. This made the sessions more coherent, but made it difficult to attend selected papers in different sessions.

However, even though an ideal format for such a meeting was not reached in Bordeaux, a serious attempt was made to eliminate the drudgery of a long incoherent succession of short contributed papers. Equally important, the atmosphere at the meeting was exciting, many new contacts were established and one came away with the feeling that continent-wide collaboration between crystallographers in Europe had received a boost which can only be beneficial.

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Crystallographers

This section is intended to be a series of short paragraphs dealing with the activities of crystallographers, such as their changes of position, promotions, assumption of significant new duties, honours, etc. Items for inclusion, subject to the approval of the Editorial Board, should be sent to the Executive Secretary o the International Union of Crystallography (J.N. King, International Union of Crystallography, 13 White Friars, Chester CH1 1NZ, England).

Professor **Charles A. Coulson** died on Monday, January 7th. His very varied career, which included appointments in mathematics, physics, chemistry and even a year of research in biology, reflected his wide and absorbing interest in the mathematical understanding of the structure of matter and particularly of molecules. His influence on chemical crystallography was intimate and profound. For years, crystallographers have brought results of all accurate structure analyses to Charles Coulson and have taken from his a new understanding of their observations and new ideas for research. He was a remarkably lucid lecturer, who spoke all over the world on scientific problems, and on science and religion. Yet he seemed to be always at home in Oxford for those who needed him. He held the Rouse Ball chair of applied mathematics at Oxford from 1952 to 1972 and then, in the last years of his life, became in name what he had long been in fact, the University's first Professor of Theoretical Chemistry.

Professor **E. C. Lingafelter** succeeds **R. A. Young** as President of the American Crystallographic Association for 1974. Dr **M. H. Mueller** will continue to serve as Secretary of A.C.A. until the end of 1975. Dr **R. D. Burbank** and Dr **C. N. Caughlan** have been elected Vice-President and Treasurer, respectively, for 1974.

Professor **A. C. T. North** has been appointed to the Chair of Biophysics and Head of the Astbury Department of Biophysics at the University of Leeds. Previously he was a Senior Research Officer in the Laboratory of Molecular Biophysics at the University of Oxford.

International Union of Crystallography

Commission on Crystallographic Computing

Call for Material for Supplement to the Third Edition of the

World List of Crystallographic Computer Programs

The third edition of the *World List of Crystallographic Computer Programs* has been published in the *Journal of Applied Crystallography* (1973), **6** (4), pp. 309–346. The required information for submission of programs to this list was first described in an announcement [*Acta Cryst.* (1971), A **27** (4), 393–396], and again as part of the *World List*.

Since a large number of useful crystallographic computer programs were not included in the third edition, the Commission on Crystallographic Computing has decided to publish supplements to the list on an annual basis, until such time as a completely new list is required. This work is done for the benefit of crystallographers in general, and to avoid any wasteful duplication of effort. Therefore, the Commission wishes to take this opportunity to urge all crystallographer programmers to take the time to prepare the material required for for the proposed supplement. The formats and abbreviations will be identical with those for the third edition. Please send the necessary information about your unlisted programs, within two months from the date of publication of this announcement, to the Editor in charge of the Supplement: Dr G. C. Bassi, CNRS Laboratoire de Rayons X, B.P. No. 166, Centre de Tri, 38042 Grenoble Cedex, France.

Notes and News

Announcements and other items of crystallographic interest will be published under this heading at the discretion of the Editorial Board. The notes (in duplicate) should be sent to the Executive Secretary of the International Union of Crystallography (J. N. King, International Union of Crystallography, 13 White Friars, Chester CH1 1NZ, England).

The Montpellier Documentation Centre has just issued a new index of French industrial and university laboratories which produce mineral crystals. This index supersedes the index prepared in 1967.

This index may be obtained by sending the sum of three francs (postage-stamps) or four international reply coupons to Professor Vergnoux, Centre de Documentation sur les Synthèses Cristallines, Université des Sciences et Techniques du Languedoc, Place Eugène Bataillon, F-34060 Montpellier Cedex, France.

Book Reviews

Works intended for notice in this column should be sent direct to the Book-Review Editor (M. M. Woolfson, Physics Department, University of York, Heslington, York YO1 5DD, England). As far as practicable books will be reviewed in a country different from that of publication.

The opaqne minerals in stony meteorites. By PAUL RAMDOHR. Pp. 245, Plates 70. Amsterdam: Elsevier, 1973. Price *f* 65 (about U.S. $ 25.20).

This relatively small book is rather of the nature of a final research report of the author's own extensive work concerning the examination of polished sections of some 350 meteoritic stones. As the title indicates, the interest here is not in the dominant silicate minerals but in the less abundant opaque or semi-opaque minerals and the emphasis is on the