Before compilation, the minimum and maximum values expected for the Miller indices must be set by the user. No external libraries are required.

The program has also been run successfully under the CDC NOS/VE and the IBM VM/CMS operating systems. It should be easily portable, with minor modifications, to any system which has a Fortran77 compiler.

Hardware environment: The program is implemented on a CDC Cyber 180-830 dual processor with 2 million words of memory (one word = 60 bits) at the University of Bradford Computer Centre. With optimized compilation and segmented loading, the binary object program requires 111 000 words of memory for Miller indices ranging from −12 to +11 and 310 000 words for indices ranging from −18 to +17.

The program runs interactively, but reads the list of indices from a file. Output is written to the terminal screen, but could be diverted to a file or printer with minor modifications.

The program has also been run successfully on a CDC Cyber 932 and an Amdahl 5890.

Program specification: The program consists of a main segment and nine subroutines totalling about 600 lines of Fortran source code. Communication between routines is entirely through COMMON blocks. The subroutine structure permits a high degree of segmentation. A segmentation tree structure has been designed for use under the NOS operating system.

The program has been tested with artificially created sets of test data for all trigonal and hexagonal space groups. Run times are of the order of two or three seconds for data sets with up to 500 reflections.

Documentation: Instructions on compilation *etc.* are contained in COMMENT statements in the source program.

Availability: Enquiries should be made to the author.

Keywords: Space group, trigonal, rhombohedral, hexagonal.

References

International Tables for Crystallography (1983). Vol. A. Dordrecht: Reidel. (Present distributor Kluwer Academic Publishers, Dordrecht.)

Yerkess, J. (1990). *J. Appl. Cryst.* **23**, 142–143.

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 of the International Union of Crystallography (J. N. King, International Union of Crystallography, 5 Abbey Square, Chester CH1 2HU, England).

J. Appl. Cryst. (1991). **24**, 973

Arne F. Andresen 1926–1991

Our dear friend and colleague, Arne F. Andresen, died suddenly on 20 January as a result of a tragic traffic accident near his home in Oslo; he was 64 years old. Dr Andresen received his education in natural science at the University of Oslo, and since 1954 he had been active in research in the Physics Department at the Institute for Energy Technology at Kjeller. His main interest for all these years had been the study of magnetism and magnetic materials. He was also a pioneer in the study of the structures and properties of metal hydrides. In several papers he investigated the structural conditions for the efficiency of such materials as energy carriers. He published more than 60 papers in international scientific journals, many of them in cooperation with Norwegian and foreign scientists. During his career he was a guest scientist in the USA and Switzerland.

Arne F. Andresen was a member of the International Steering Committee on Properties and Applications of Metal Hydrides for the past ten years. For 15 years he was a member of the Commission on Neutron Diffraction of the International Union of Crystallography, three years as its Chairman. In this capacity he, together with T. M. Sabine, carried out a very valuable intercomparison of nearly all existing neutron powder diffraction instruments in the world.

He had just finished the last modernization of the powder diffractometer OPUS at the Kjeller reactor and was busy preparing samples for investigation together with his collaborators in Norway and elsewhere. The powder technique complemented the other research being done at the Chemistry Department at the University of Oslo, and many students did their thesis work with Arne as their supervisor.

His early death is a serious loss for Norwegian science and the whole neutron diffraction community. His many friends will miss him, his enthusiasm and delightful sense of humour.

COLLEAGUES AT THE INSTITUTE FOR ENERGY TECHNOLOGY, KJELLER, NORWAY

J. Appl. Cryst. (1991). **24**, 973–974

Luigi Cavalca 1911–1991

On 12 January 1991 **Luigi Cavalca**, Professor Emeritus of Structural Chemistry at the University of Parma, died. He was born in Vicenza in 1911. After gaining the General Certificate of Education in 1932, he started teaching in elementary schools in Parma, but, in spite of his natural bent for teaching, he was not completely satisfied with that activity because of a deep desire to develop his knowledge, particularly in the scientific field. So, during his work as a teacher, he started studying again and in 1940 gained the General Certificate for Science and matriculated in the chemistry courses at the University of Parma where he was taught by Professor A. Ferrari, one of the pioneers in Italy in the field of chemical crystallography, who was at that time teaching general chemistry. Professor Ferrari realized Cavalca was an exceptional student and engaged him as internal pupil introducing him to the field of scientific research. During the war years, from 1943 to 1945, the assistants of the General Chemistry Department were called to serve in the army, leading to a shortage of personnel, so Professor Ferrari persuaded the Ministry of Education to move Cavalca from teaching to the University as an assistant. During these years Cavalca, not yet graduated, started his research activity in the field of crystallography, a field in which he soon became one of the most qualified exponents in Italy. In 1945 he graduated in chemistry (inorganic chemical-physics field) with an honours degree and in 1948 was appointed as Assistant Professor in the Department of Mineralogy at the University of Parma.

During these years, the success of his activities was recognized by grants, awards and teaching assignments on subjects like mineralogy, chemical spectroscopy and crystal chemistry, where he had acquired particular knowledge.

In 1954 he obtained the formal qualification for University teaching (Libera Docenza) and three years later was appointed to the Chair of Structural Chemistry at the University of Parma, the first chair of its kind established in Italy. Those were the years when, also in Italy, researchers were becoming more and more conscious of the importance that crystallographic diffraction methods were assuming in modern chemistry. In 1960 Cavalca became Full Professor and in 1962 started to teach physical chemistry until 1968, when he began again his previous teaching of structural chemistry.

Luigi Cavalca founded and directed the Departments of Structural Chemistry and Physical Chemistry of the University of Parma and a School of Structural Crystallography, which became well known and appreciated not only at the national level but also internationally.

He was a scholar gifted with superior intelligence and curiosity for knowledge, which is typical of a high level researcher and he succeeded, even if working with limited means, in obtaining in his studies results comparable with those of the most advanced and well equipped research groups working abroad. At the beginning of electronic computing he immediately realized the importance that this tool had for his research and this led him to found in 1960 the Computing Centre of the University of Parma, which he directed for over ten years putting at the disposal of researchers and students of the University the most advanced computing facilities.

He was also director of the Centre for Study of Structural Chemistry of the Italian Research Council from its foundation (1970) until 1979 and afterwards was appointed Chairman of the Scientific Council of this Centre until 1983.

His researches range across several different fields and are mainly based on diffractometric methods of modern crystallography; the first ones dealt with several compounds of interest in inorganic chemistry, but his wide knowledge of and curiosity in the problems of the natural kingdom led him also to study minerals and inorganic compounds of biological interest, like the phases of calcium carbonate in the shells of lamellibranchiata and the skeletons of acantharia that he showed were built of single crystals of strontium sulfate. Further research work spanned the fields of coordination, metal-organic and organic compounds, fields to which he brought valuable contributions, both through results but mainly through methods. Indeed, it is important to remember that the successes that diffraction methods have reached today were just starting at that time, making use of the knowledge the research brought on one side and the development of electronic computers and automatic devices for collecting experimental data on the other. A strict and accurate experimenter, he succeeded in setting up apparatus for collecting diffraction data and for measuring X-ray intensities and developed computer methods for processing them. He had an extremely clear vision of structural crystallography, particularly of those problems that, at that time, seemed obscure and complicated to the researchers working in the field. A teacher of really exceptional gifts, he succeeded in transferring to his pupils the very clear ideas and enthusiasm he had for scientific research.

A scientist of great rigour and deep culture, he enjoyed general esteem not only from his pupils and colleagues but also from the Italian community of crystallographers, and abroad from all of those who knew him. Also, from the human point of view, his gifts were really exceptional, particularly in being able to recognize the real merits of people and in helping students and pupils. As Dean of Faculty and a member of Councils of the University, he always endeavoured to support students, particularly those with merits and deserving help.

In addition to the love of his pupils and the esteem of his colleagues, he received also formal honours like the Gold Medal for Culture and the 'Commenda al Merito della Repubblica.'

Health and family problems in the last years took him away from the University, but this fact does not reduce the sorrow of his death to all who knew him, particularly the writer who, for so many years, collaborated with him in his studies and shared in his successes and also received from him many gifts of knowledge given with love and friendship.

M. NARDELLI

J. Appl. Cryst. (1991). **24**, 974

Sir Frank Claringbull 1911–1990

G. F. Claringbull was best known to mineralogical crystallographers for *Crystal Structures of Minerals* (1965) of which he was joint author with Sir Lawrence Bragg. This thoughtful, indeed seminal, survey was much more than just a revised edition of Bragg's classic *Atomic Structure of Minerals* (1937).

Gordon Frank Claringbull was born on 21 August 1911, educated at Finchley Grammar School and Queen Mary College, where he graduated as BSc in 1932 and PhD in 1935, and joined the staff of the Mineralogy Department of the Natural History Museum, South Kensington, London, in 1935. Except for secondment to the University of Birmingham in 1939 to learn the techniques of X-ray crystallography and consequent wartime work on sabotage explosives with Sir Gordon Cox, he was to remain at the Natural History Museum for the next 41 years. He was sole or joint author of papers on a wide variety of minerals between 1938 and 1961, each stemming from a request for indentification by the museum. Claringbull's contribution was usually the determination of unit-cell data. Seven new minerals, including the rare gem minerals sinhalite and taaffeite, were described impeccably. A short communication on kalsilite appeared in the first number of *Acta Crystallographica*. The wide range of his mineralogical research fitted him admirably for collaboration in *Crystal Structures of Minerals* (1965).

As Keeper of Mineralogy 1953–1968 his administrative skills enabled him to provide his laboratory with the most up-to-date equipment. On appointment as Director of the Natural History Museum in 1968 he took up the challenge to modernize the museum with characteristic energy and by his retirement in 1976 the museum had begun to acquire a widely acclaimed new style.

He served the Mineralogical Society as General Secretary 1938–1959 and as President 1965–1967. He was knighted in 1975. He died on 23 November 1990.

DUNCAN McKIE

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, 5 Abbey Square, Chester CH1 2HU, England).

J. Appl. Cryst. (1991). **24**, 974

International Scientific Exchange Programme

The International Council of Scientific Unions and UNESCO have just set up a new joint programme aimed at promoting international cooperation in science by enabling scientists from developing countries to carry out short-term studies in well established scientific centres and to learn and use techniques not accessible to them in their own countries.

Candidates must already be engaged in research, return to their country of origin upon termination of their fellowship and produce evidence that the theoretical and practical knowledge or training to be acquired in the foreign laboratory will be beneficial to their scientific development. Reference: UNESCO/ICSU Short Term Fellowships, Division of Basic Sciences, 1 rue Miollis, F-75015 Paris, France.