

$\langle |\alpha - \alpha_H| \rangle$  decreases from  $\pi/2$  to 0 is probably satisfactory, and no attempt was made at the time to devise the best weighting function on the basis of a rigorous mathematical treatment, such as carried out by Woolfson (1956) for the centrosymmetrical case.

The weights which should be assigned to the structure amplitudes so that the mean-square error in electron density due to the phase-angle errors ( $\alpha - \alpha_H$ ) is minimized constitute what may be regarded as the best set of weights, and as the use of these weights puts the procedure on a more satisfactory theoretical basis they are derived here.

Following Blow & Crick (1959) it can be shown that these weights are defined by

$$W = \int_{-\pi}^{\pi} \cos \xi p(\xi) d\xi,$$

where

$$\xi = \alpha - \alpha_H.$$

It was shown in the earlier paper that

$$p(\xi) = \exp(X \cos \xi) / 2\pi I_0(X),$$

where

$$X = 2|F| |F_H| / \Sigma_L$$

and consequently

$$W = I_1(X) / I_0(X),$$

where  $I_0$  and  $I_1$  are respectively the zero-order and first-order modified Bessel functions of the first kind (Watson, 1922, p. 77). Values of the weighting factor  $W$  are listed in Table 1. They differ from the earlier set in being consistently smaller for all values of  $X$ . Up to about  $X = 1.5$  they agree fairly closely with the weights applicable to the centrosymmetrical case.

The use of the weighting procedure permits the inclusion from the beginning of a structure analysis of

Table 1. Values of the weighting factor  $W$  as a function of  $X = 2|F| |F_H| / \Sigma_L$

		X					
		0	0.25	0.50	0.75	1.0	1.5
W	0	0.124	0.243	0.351	0.446	0.596	
		X					
		2.0	3.0	4.0	5.0	$\infty$	
W	0.698	0.810	0.864	0.894	1.000		

all the  $|F_0|$  data. Moreover the calculation of the phase angles and of the electron-density distribution can be carried out consecutively without a break to select the data which are judged, in some more or less subjective manner, safe to be included in the Fourier calculation, an advantage when an electronic digital computing machine is available.

An example of the successful application of the method is provided by the analysis of the crystal structure of epi-limonol iodoacetate,  $(C_{26}H_{31}O_8)COCH_2I$  (Arnott, Davie, Robertson, Sim & Watson, 1960), where, out of the 74 light atoms (neglecting hydrogen) in the asymmetric crystal unit, 50 were placed in the initial three-dimensional Fourier series calculated from phase angles based on the iodine atoms alone.

## References

- ARNOTT, S., DAVIE, A. W., ROBERTSON, J. M., SIM, G. A. & WATSON, D. G. (1960). *Experientia*, **16**, 49.  
 BLOW, D. M. & CRICK, F. H. C. (1959). *Acta Cryst.* **12**, 794.  
 SIM, G. A. (1959). *Acta Cryst.* **12**, 813.  
 WATSON, G. N. (1922). *A Treatise on the Theory of Bessel Functions*. Cambridge: University Press.  
 WOOLFSON, M. M. (1956). *Acta Cryst.* **9**, 804.

## 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 General Secretary of the International Union of Crystallography (Dr D. W. Smits, Laboratory of Inorganic and Physical Chemistry, 10 Bloemensingel, Groningen, The Netherlands).*

### The 18th Annual Meeting of the Electron Microscope Society of America

will be held August 29–31, 1960 in the Brooks Memorial Union Building at Marquette University, Milwaukee, Wisconsin.

In addition to the general sessions of contributed papers, it is planned to hold a special session of short papers on interesting, useful, and unusual electron microscopic techniques. Abstracts (limit—150 words) of papers for presentation at these sessions may be submitted to Professor W. C. Bigelow, EMSA Program Chairman, Department of Chemical and Metallurgical Engineering, University of Michigan, Ann Arbor, Michigan before May 15, 1960.

As special features of the meeting, three symposia are also being planned on: (1) 'The Structure of Teeth and Bone'—F. J. Sjöstrand, Chairman, (2) 'Recent Developments in Electron Metallography'—D. M. Teague, Chairman, and (3) 'Theory and Applications of Electron Diffraction'—G. R. Grieger, Chairman. These will include invited talks by experts on various topics in the fields covered by the symposia. There will also be extensive scientific and commercial exhibits.

Further information concerning the program of the meeting may be obtained from the Program Chairman. Information concerning the Scientific and Commercial Exhibits may be obtained from Dr Stanley Weinreb, EMSA Local Arrangements Chairman, Department of Anatomy, Marquette University School of Medicine, 516 North 15th Street, Milwaukee 3, Wisconsin.