As regards the C orbit in zinc, the sign and magnitude of the experimental result are helpful in deciding between alternative assignments suggested by Fletcher *et al.* They suggest that the C orbit may either be round an electron surface in the third zone called the butterfly, or a magnetic breakdown orbit involving the arms of the second zone hole surface and the first zone hole surface. Their figure 6 shows that the latter orbit consists for most of its length of a second zone hole orbit and therefore, if this were the correct interpretation of the C orbit, we would expect it to have a similar sensitivity to strain as the β orbit which is nearby on the same surface. On the other hand the butterflies are electron overlaps into the third zone around L and inspection of their position relative to that of the second zone arms makes it seem probable that the sensitivities of two alternatives to strain would have opposite sign.

In the table 1 we have given the theoretical calues for both alternative assignments. We observe that these have opposite signs, and looking at the kind of agreement in the table obtained for the β orbit, there seems to be no real doubt that given the alternatives the orbit is to be associated with the second zone hole surface. Indeed it is gratifying that the butterflies need not be invoked since pseudopotential calculations fitted to known de Haas–van Alphen data (Stark and Falicov 1967) rule out the existence of the butterflies.

4. Conclusion

We have used a new technique to measure the changes produced in the Fermi surfaces of zinc and cadmium by uniaxial compression along the $\langle 0001 \rangle$ axis. We have not attempted any detailed theoretical interpretation, although we have shown that the trend of the results is generally consistent with nearly free electron theory.

It has also been possible to use the sign of one of our results to distinguish plausibly between two alternative orbits round the Fermi surface as the origin of a particular set of de Haas–van Alphen oscillations in zinc.

Our results have been compared with other results for the changes of Fermi surface produced by hydrostatic pressure, temperature and uniaxial stress. Good agreement is obtained.

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References

Alers G A and Neighbours J R 1958 *J. Phys. Chem. Solids* **7** 58–64
Anderson J R , O'Sullivan W J and Schirber J E 1967a *Phys. Rev.* **153** 721–5
Anderson J R, O'Sullivan W J, Schirber J E and Soule D E 1967b *Phys. Rev.* **164** 1038–42
Anderson J R, Schirber J E and Stone D R 1970 *Propriétés Physiques des Solides sous Pression* (Paris: Centre National de la Recherche Scientifique) pp 131–7
Aron P R and Chandrasekhar B S 1969 *Phys. Lett.* **30A** 86–7
Balain K S, Grenier C G and Reynolds J M 1960 *Phys. Rev.* **119** 935–8

Bate R T and Einspruch N G 1965 *Phys. Lett.* **16** 11–12
Berlincourt T G and Steele M C 1954 *Phys. Rev.* **95** 1421–8
Brandt N B and Ryabenko G A 1960 *Sov. Phys.–JETP* **10** 278–9
Chandrasekhar B S, Fawcett E, Sparlin D M and White G K 1967 *Proc. Tenth Int. Conf. Low Temp. Phys., Moscow* 328–32
Fletcher R, MacKinnon L and Wallace W D 1969 *Phil. Mag.* **20** 245–58
Gamble D and Watts B R 1972 *Phys. Lett.* **40A** 22
Garland C W and Silverman J 1960 *Phys. Rev.* **119** 1218–22
—— 1962 *Phys. Rev.* **127** 2287
Glinski R and Templeton I M 1969 *J. low temp. Phys.* **1** 223–9
Griessen R and Kundig A 1972 *Solid St. Commun.* **11** 295–8
Griessen R and Sorbello R S 1972 *Phys. Rev.* B **6** 2198–208
Itskevich E S and Fisher L M 1968 *Sov. Phys.–JETP* **26** 66–70
Meltz P J 1966 *Phys. Rev.* **152** 540–7
O'Sullivan W J and Schirber J E 1966 *Phys. Rev.* **151** 484–94
O'Sullivan W J, Schirber J E and Anderson J R 1967 *Solid St. Commun.* **5** 525–8
—— 1968 *Phys. Lett.* **27A** 144–5
Perz J M and Hum R H 1971 *Can. J. Phys.* **49** 1–8
Perz J M, Hum R H and Coleridge P T 1969 *Phys. Lett.* **30A** 235–6
Reitz L M and Sparlin D M 1972 *Phys. Rev.* B **5** 3803–7
Schirber J E 1970 *Phys. Lett.* **33A** 172–3
—— 1971 *Phys. Lett.* **35A** 194–5
Schirber J E and O'Sullivan W J 1968 *Proc. Eleventh Int. Conf. Low Temp. Phys., St. Andrews* pp 1141–4
—— 1969a *Phys. Rev.* **184** 628–34
—— 1969b *Solid St. Comm.* **7** 709–11
—— 1970a *Phys. Rev.* B **2** 2936–40
—— 1970b *Propriétés Physiques des Solides sous Pression* (Paris: Centre National de la Recherche Scientifique) pp 113–21
Shoenberg D and Stiles P J 1964 *Proc. R. Soc.* **281A** 62–91
Shoenberg D and Watts B R 1967 *Phil. Mag.* **15** 1275–88
Slavin A J 1972 to be published
Stark R W and Falicov L M 1967 *Phys. Rev. Lett.* **19** 795–8
Tay C Y and Priestley M G 1970 *Propriétés des Solides sous Pression* (Paris: Centre National de la Recherche Scientifique) pp 139–42
Templeton I M 1966 *Proc. R. Soc.* **292A** 413–23
Testardi L R and Condon J H 1970 *Phys. Rev.* B **1** 3928–42
Tsui D C and Stark R W 1966 *Phys. Rev. Lett.* **16** 19–22