

SECTION K**REFERENCES AND APPOINTMENTS****K.1-K.62**

K.1-K.22

EXAMINING

K.23-K.43

APPOINTMENTS

K.44-K.51

GRANT APPLICATIONS

K.52-K.55

HONOURS AND AWARDS

K.56-K.62

MISCELLANEOUS

MATERIAL IN THIS SECTION IS SUBJECT TO RESTRICTION

EXAMINING**Higher Degrees**

K.1	1952, 1956	K.6	1975-78
K.2	1967, 1968	K.7	1979
K.3	1970, 1971	K.8	1980, 1981
K.4	1972	K.9	1982
K.5	1973, 1974	K.10	1983

Aberdeen

Frank served as External Examiner for Aberdeen University Department of Natural Philosophy from 1948.

K.11	1948 (1)	K.15	1950
K.12	1948 (2)	K.16	1955
K.13	1949 (1)	K.17	Examination papers 1941-47
K.14	1949 (2)		

Newcastle

Frank served as External Examiner for Newcastle University School of Physics 1976-78.

K.18	1975-76	K.21	1977 (2)
K.19	1976	K.22	1978
K.20	1977 (1)		

APPOINTMENTS

K.23	1954, 1960	K.34	1976-77
K.24	1964	K.35	1977 (1)
K.25	1965	K.36	1977 (2)
K.26	1966	K.37	1977 (3)
K.27	1967	K.38	1978-80
K.28	1968	K.39	1981
K.29	1969	K.40	1982
K.30	1970	K.41	1983
K.31	1971, 1972	K.42	1984, 1987
K.32	1973	K.43	Nd.
K.33	1974, 1975		

GRANT APPLICATIONS

K.44	1957, 1959, 1966-68	K.48	1972, 1975
K.45	1968-69	K.49	1976
K.46	1969-70	K.50	1977, 1979
K.47	1971	K.51	1982

HONOURS AND AWARDS

K.52	1967, 1968	K.54	1977, 1978
K.53	1972, 1975	K.55	1980, 1982-84

MISCELLANEOUS**Cambridge University Committee for Geodesy and Geophysics**

Frank was invited to serve on the Committee as Royal Society representative on 10 December 1974. The Committee met annually to receive a report from the Head of the Department of Geodesy and Geophysics and to advise on Departmental activities. Frank served until its dissolution in 1980 when the Department was merged with those of Geology, and Mineralogy and Petrology in the new Department of Earth Sciences.

The material consists principally of correspondence and committee papers.

K.56	1974, 1975	K.59	1978
K.57	1976	K.60	1979, 1980
K.58	1977		

NATO Advanced Study Institutes

Frank gave advice to the Advisory Panel on the Advanced Study Institutes Programme between 1974 and 1986.

K.61 Correspondence and papers.

United Bristol Hospitals Advisory Appointments Committee

K.62 Frank served as Bristol University representative 1967.

LIST OF PUBLICATIONS

The following bibliography of 148 items was supplied to the cataloguers by Sir Charles Frank as the most complete list of his publications. References in the catalogue are to this list in the form *Bibliog. ...*

1935

- 1 "Dipole induction and the solvent effect in dipole moment measurements", *Proc. Roy. Soc. Lond.* A152, 171.

1936

- 2 "Electrical evidence on calcite imperfections", *Nature* 137, 656.
- 3 "Chemical kinetics of dielectric relaxation", *Trans. Faraday Soc.* 32, 1634.

1937

- 4 with L.E. Sutton. "A possible explanation of some anomalous electric dipole moments", *Trans. Faraday Soc.* 33, 1307.

1938

- 5 with K. Wirtz. "Ordnung and Umwandlung in kondensierten Phasen", *Naturwiss.* 26, 687-97.
6. "Quasi-kristalline und kristalline Flüssigkeiten", *Phys. Zeitschr.* 39, 530.

1939

- 7 "Melting as a disorder phenomenon", *Proc. Roy. Soc. Lond.* A170, 182.

1946

- 8 "Molecular structure of deeply supercooled water", *Nature* 157, 267.
- 9 "A comparison of Debye's and Onsager's theories of the dielectric constants of concentrated polar media", *Trans. Faraday Soc.* 42A, 19-24.
- 10 "Some mathematical models representing polar molecules in crystals", *Trans. Faraday Soc.* 42A, 24-35.
- 11 "Communication to Dielectrics Discussion", *Trans. Faraday Soc.* 42A, 250-252.

1947

- 12 "The mass of the neutrino", *Proc. Phys. Soc.* 59, 408-412.
- 13 "Hypothetical alternative energy sources for the 'second meson' events", *Nature* 160, 525-527.

1948

- 14 "An isotopic abundance rule and its bearing on the origin of the nuclei", *Proc. Phys. Soc.* 60, 211.
- 15 "On slip bands as a consequence of the dynamic behaviour of dislocations", in *Strength of Solids*, Phys. Soc. Bristol Conference Report, 46-51.

1949

- 16 "On the equations of motion of crystal dislocations", *Proc. Phys. Soc.* A62, 131-134.
- 17 "Sessile dislocations", *Proc. Phys. Soc.* A62, 202-203.
- 18 with W.K. Burton & N. Cabrera. "Role of dislocations in crystal growth", *Nature* 168, 398-399.
- 19 with J.H. van der Merwe. "Misfitting monolayers". *Proc. Phys. Soc.* A62, 315-316.
- 20 "Diffraction by a screw dislocation", *Research* 2, 552.
- 21 "The influence of Dislocations on Crystal Growth", *Discussions of the Faraday Soc.* 5, 48-54.
- 22 with J.H. van der Merwe. "One-dimensional dislocations. I. Static theory", *Proc. Roy. Soc. Lond.* A198, 205.

- 23 with J.H. van der Merwe. "One-dimensional dislocations. II. Misfitting monolayers and oriented overgrowth", *Proc. Roy. Soc. Lond.* A198, 216.
- 24 with J.H. van der Merwe. "One-dimensional dislocations. III. Influence of the second harmonic term in the potential representation on the properties of the model", *Proc. Roy. Soc. Lond.* A200, 125.
- 1950
- 25 "Note on the Structure of a Crystal Surface", *Phil. Mag.* 41, 200.
- 26 "Radially symmetric phase growth controlled by diffusion", *Proc. Roy. Soc. Lond.* A201, 586.
- 27 with J.H. van der Merwe. "One-dimensional dislocations. IV. Dynamics", *Proc. Roy. Soc. Lond.* A201, 261.
- 28 with W.T. Read. "Multiplication processes for slow moving dislocations", *Phys. Rev.* 79, 722.
- 28a "Lattice sums for ionic crystals", *Phil. Mag.* 41, 1287.
- 1951
- 29 with J.D. Eshelby & F.R.N. Nabarro. "Equilibrium of linear arrays of dislocations", *Phil. Mag.* 42, 351.
- 30 with W.K. Burton & N. Cabrera. "The growth of crystals and the equilibrium structure of their surfaces", *Phil. Trans. Roy. Soc. Lond.* A143, 299-358.
- 31 with D.S. Oliver. "A simple goniograph", *Research* 4, 341.
- 32 "Distribution of slip in metal crystal", *J. Appl. Phys.* 22, 1387.
- 33 "Crystal dislocations - elementary concepts and definitions", *Phil. Mag.* 42, 809.
- 34 "The growth of carborundum. Dislocations and polytypism", *Phil. Mag.* 42, 1014.
- 35 "Capillary equilibria of dislocated crystals", *Acta Cryst.* 4, 497.
- 36 "The theory of oriented overgrowth of crystals", *Proc. Phys. Soc.* 64A, 941.

1952

- 37 "Crystal growth and dislocations", *Phil. Mag. Supp.* 1, 91.
- 38 with A.N. Stroh. "On the theory of kinking", *Proc. Phys. Soc.* 65, 811.
- 39 "A Discussion on theory of liquids. Supercooling of liquids", *Proc. Roy. Soc. Lond.* 215, 43-46.
- 40 "A note on twinning in alpha-uranium", *Acta Metallurgica* 1, 71-74.

1953

- 41 "Martensite", *Acta Metallurgica* 2, 15-21.
- 42 with J.F. Nicholas. "Stable dislocations in the common crystal lattices", *Phil. Mag.* 44, 1213.
- 43 "On tin whiskers", *Phil. Mag.* 44, 854.
- 44 "On spontaneous asymmetric synthesis", *Biochem. et Biophys. Acta* 11, 459.

1954

- 45 "Hexagonal networks of dislocations", *Phys. Soc. Report on Bristol Conference*, 159.

1955

- 46 "Chemistry of crystal dislocations", in *Chemistry of Solid State*, ed. W.E. Garner, Butterworths, London.
- 47 with N. Thompson. "On deformation twinning", *Acta Metallurgica* 3, 30.
- 48 with K.E. Puttick. "Comments on transformations in plain carbon steels", *J. Appl. Phys.* 26, 1522.

1956

- 49 with K.E. Puttick. "Cementite morphology in pearlite", *Acta Metallurgica*, 4, 206.
- 50 "The origin of dislocations in crystals grown from the melt", in *Deformation and Flow of Solids, Madrid Colloquium 1955*.

- 51 with A. Keller. "Periodicity in Ice-flowers", *Phil. Mag.* 1, 975-976.
- 52 with D. Turnbull. "Mechanism of diffusion of copper in germanium", *Phys. Rev.* 104, 617.
- 53 "Theories of melting", *Trans. Faraday Soc.* 52, 884.
- 54 "On the X-ray diffraction spikes of diamond", *Proc. Roy. Soc. Lond.* A237, 168.

1957

- 55 Contributions to the General Discussion "Molecular mechanism of rate processes in solids. Steady-state processes not involving lattice rearrangement", *Discussions of the Faraday Soc.* 23.
- 56 "Dislocations and point defects", *Discussions of the Faraday Soc.* 23, 122.

1958

- 57 with J.S. Kasper. "Complex alloy structures regarded as sphere packings. I. Definitions and basic principles", *Acta Cryst.* 11, 184.
- 58 with T. Vreeland, Jr. "Etching patterns in high purity zinc", *Phil. Mag.* 3, 419.
- 59 with A. Keller & A. O'Connor. "Deformation processes in polyethylene interpreted in terms of crystal plasticity", *Phil. Mag.* 3, 64.
- 60 "The nature of the real crystal", 45th Annual May Lecture, *J. Inst. of Metals* 85, 581.
- 61 "Dislocation Theory", *Nuo. Cimento. Suppl.* 2, 386.
- 62 with K.E. Puttick & Eileen M. Wilks. "Etch Pits and Trigons on Diamond. I", *Phil. Mag.* 3, 1262.
- 63 with K.E. Puttick & Eileen M. Wilks. "Etch Pits and Trigons on Diamond. II", *Phil. Mag.* 3, 1273.
- 64 with G. Meyrick & I. Braun. "Grain boundary etching on pure aluminium", *Phil. Mag.* 3, 1312.
- 65 "On the theory of liquid crystals", *Discussions of the Faraday Soc.* 25.
- 66 "Introductory Lecture" in ed. R.H. Doremus et al, *Growth and Perfection of Crystals*, Wiley, 1-10.

1959

- 67 with J.S. Kasper. "Complex alloy structures regarded as sphere packings. II", *Acta Cryst.* 12, 483.
- 68 with A. Keller & A. O'Connor. "Observations on single crystals of an isotactic polyolefin. Morphology and chain packing in poly-4-methyl-pentene-1", *Phil. Mag.* 4, 200.
- 69 with A.R. Lang. "Observations by X-ray diffraction of dislocations in diamond", *Phil. Mag.* 4, 383.
- 70 with A. Keller & A.W. Agar. "Crystallinity effects in the electron microscopy of polyethylene", *Phil. Mag.* 4, 32.

1960

- 71 with A. Keller & A.W. Agar. "Moire patterns and other crystallinity effects in the electron microscopy of polyethylene single crystals. I", *Fourth International Conference on Electron Microscopy, Berlin Sept. 1958*, 363-367, 1960.
- 72 with B.A. Bilby. "The analysis of the crystallography of martensitic transformations by the method of prism matching", *Acta Metallurgica* 8, 239-248.
- 73 "Future of the general degree in British Universities", *Nature* 189, 106-107.
- 74 "The future of the general degree", Report of Proc. of Home Universities Conf., 20-26.
- 75 with M.B. Ives. "Orientation-dependent dissolution of germanium", *J. Appl. Phys.* 31, 1996-1999.
- 76 "X-ray diffraction spikes of diamonds", *Nature* 191, 1188.
- 77 with M. Tosi. "On the theory of polymer crystallization", *Proc. Roy. Soc. Lond.* A263, 323-339.

1962

- 78 with M. Tosi. "Theory of sequential processes and the crystallization of high polymers", *Proc. International School of Physics "Enrico Fermi". 18th Course.* Academic Press, 936-942.

1963

- 79 with A.S. Pârasnis & J.W. Mitchell. "Linear compounds of dislocations in silver chloride with cupric ions", *Phil. Mag.* **8**, 1503.
- 80 "Geometrical thermodynamics of surfaces", in *Metal Surfaces*, American Soc. of Metals.

1964

- 81 "A note on platelets and diffraction spikes in diamonds", *Proc. Phys. Soc.* **84**, 745-748.
- 82 "The strength of polymers", *Proc. Roy. Soc. Lond.* **A482**, 9-16.

1965

- 83 "On dilatancy in relation to seismic sources", *Review of Geophysics* **1965** **3**, 485-503.
- 84 "On Miller-Bravais indices and four-dimensional vectors", *Acta Cryst.* **18**, 862-866.
- 85 with A.R. Lang. "X-ray topography of diamond" in *Physical Properties of Diamond*, ed. R. Berman, Oxford Univ. Press, 69-115.

1966

- 86 "Deduction of earth strains from survey data", *Bulletin of the Seismological Society of America.* **1966** **56**, 35-42.
- 87 "A European Physical Society?", *Bulletin of the Institute of Physics and the Physical Society* **17**, 244-247.
- 88 "A further note on dilatancy in relation to seismic sources", *Review of Geophysics* **1966**, **4**, 405-408.
- 89 "Reflections on Sadi Carnot", *Physics Education* **1**, 11-18.
- 90 with A.R. Lang, J. Kaczér & M. Polcarová. "Internal magnetic domain structure investigations in iron-silicon single crystals", *I.E.E.E. Transactions on Magnetics*, **MAG.2**, 511.

1967

- 91 "Defects in diamonds", in *Science and Technology of Industrial Diamonds. Proceedings of the International Industrial Diamond Conference*, Oxford. Industrial Diamond Information Bureau, 119-135.
- 92 "Regelation: a supplementary note", *Phil. Mag.* 16, 1267-1274.
- 93 with B.R. Lawn. "On the theory of Hertzian fracture", *Proc. Roy. Soc. Lond.* A299, 291-306.
- 94 with B.R. Lawn, A.R. Lang & Eileen M. Wilks. "A study of strains in abraded diamond surfaces", *Proc. Roy. Soc. Lond.* A301, 239-252.

1968

- 95 with L.R. Alldredge. "A peculiar property of the geomagnetic field", *J. Geoph. Res.* 73, 677-682.
- 96 with I.M. Ward & T. Williams. "Calibration procedure for gel permeation chromatography", *Journal of Polymer Science A-2* 6, 1357-1309.
- 97 "Curvature of Island Arcs", *Nature* 220, 363.
- 98 "Two-component flow model for convection in the Earth's upper mantle", *Nature* 220, 350-352.

1969

- 99 "Diamonds & deep fluids in the upper mantle", in ed. S.K. Runcorn, *The application of modern physics to the Earth and planetary interiors*, Wiley, 247-250.
- 100 "The use of SI units in physics - A flexible policy", *Phys. Bull.* 20, 58-59.
- 101 "C.F. Powell (1903-1969). A tribute from a colleague". *Scientific World* 6, 5-6.

1970

- 102 with V.B. Gupta & I.M. Ward. "The effect of mechanical twinning on the tensile modulus of polyethylene", *Phil. Mag.* 21, 1127-1145.
- 103 "The strength and stiffness of polymers", *Proc. Roy. Soc. Lond.* A319, 127-136.

- 104 with K.H.G. Ashbee. "Dislocations in the fluorite structure", *Phil. Mag.* 21, 211-213.
- 1971
- 105 "On Lyttleton's extensions of Ramsey's theory of the nature of the core of the earth", *Geophysical Journal of the Royal Astronomical Society* 23, 461-464.
- 106 "On the capillary bonds between grains in moist sand", *Transactions and Journal of the British Ceramic Soc.* 70, 105-106.
- 107 with A. Keller & M.R. Mackley. "Polymer chain extension produced by impinging jets and its effect on polyethylene solution", *Polymer* 12, 467.
- 108 with D.H. Perkins. "Biographical Memoir of Cecil Frank Powell 1903-1969", *Biographical Memoirs of Fellows of the Royal Society* 17, 541-563.
- 1972
- 109 "On the kinematic theory of crystal growth and dissolution processes, II", *Zeitschrift für Physikalische Chemie, Neue Folge* 77, 84-92.
- 110 "An outline of nucleation theory", *Journal of Crystal Growth* 13/14, 154-156.
- 111 "The future of crystal growth", *Journal of Crystal Growth* 13/14, 9-11.
- 112 "Contributions to study of capillary bonds between grains in moist sand", *Transactions and Journal of the British Ceramic Soc.* 71, 94.
- 113 "A note on the reading of Kossel Patterns", *Journal of the Less Common Metals* 28, 7-13.
- 114 "On plate tectonics, the analogy with glacier flow and isostasy", in ed. H.C. Beard et al, *Flow and Fracture of Rocks*, Geophysical Monograph Series, vol.16, American Geophysical Union, Washington, D.C.
- 1973
- 115 "Dislocation models for fault creep processes", *Phil. Trans. Roy. Soc. Lond.* A274, 351-354.
- 116 with D.J. Barber, M. Moss, J.W. Steeds & H.S.T. Tsong. "Prediction of ion-bombarded surface topographies using Frank's kinematic theory of crystal dissolution" *J. Mat. Sci.* 8, 1030-1040.

- 117 with K.H.G. Ashbee & C.K.H. Dubose. "On the bainitic transformation in uranium carbides", *J. Nucl. Mater.* 47, 323-335.
- 118 with K.H.G. Ashbee & C.K.H. Dubose. "Voids in boron carbide", *J. Nucl. Mater.* 48, 193-198.
- 119 "The equilibrium shape of gas-filled voids in a solid", *J. Nucl. Mater.* 48, 199-200.
- 120 with J.F. Nye. "Hydrology of the intergranular veins in a temperate glacier", *Proceedings of the Cambridge Symposium on the Hydrology of Glaciers*, Glaciological Society, 157-161.
- 121 with A.R. Lang & Moreton Moore. "A note on Galimov's theory of cavitation as a mechanism for the synthesis of natural diamond", *Nature* 246, 143-144.
- 1974
- 122 "Early discoverers XXI. Descartes' observations on the Amsterdam snowfalls of 4, 5, 6 and 9 February 1635", *Journal of Glaciology* 13, 535-539.
- 123 "Japanese work on snow crystals", *Journal of Crystal Growth* 24/25, 3-5.
- 124 with K.H.G. Ashbee. "Bristol's approach to Materials Studies", *Metals and Materials* 8, 126-127.
- 125 with W. Bardsley, G.W. Green & D.T.J. Hurle. "The meniscus in Czochralski growth", *Journal of Crystal Growth* 23, 341-344.
- 126 "Nucleation-controlled growth on a one-dimensional growth front of finite length", *Journal of Crystal Growth* 22, 233-236.
- 127 with K.H.G. Ashbee. "Reply to Comment by Leitnaker and Stiegler", *J. Nucl. Mater.* 55, 116.
- 128 with D. Robertson. "On the formulation of microscopic rate equations", *Journal of Chemical Physics* 60, 891-892.
- 1975
- 129 "The flow alignment of long chain molecules", Paper presented at McGill University, Montreal, as part of the 50th Anniversary celebrations of the Pulp and Paper Research Institute of Canada.
- 130 with M.R. Mackley and A. Keller. "Flow-induced crystallization of polyethylene melts", *Journal of Materials Science* 10, 1501-1509.

1976

- 131 with D.G. Crowley, M.R. Mackley & R.G. Stephenson. "Localized flow birefringence of polyethylene oxide solutions in a four roll mill", *Journal of Polymer Science* 14, 1111-1119.
- 132 with M.R. Mackley. "Localized flow birefringence of polyethylene oxide solutions in a two roll mill", *Journal of Polymer Science* 14, 1121-1131.

1977

- 133 "Surface effects in crystal plasticity", in ed. R.M. Latanision & J.F. Fourie, *Surface Effects in Crystal Plasticity*, NATO Advanced Study Institutes series. Series E: Applied Science, No. 17, Noordhoff-Leyden.
- 134 "Thermodynamics of smectic mixtures", *Journal de Physique-Lettres* 38, L-207.

1978

- 135 "Airy functions in the air: a simple way with stress problems", *Physics Education* 13, 258-263.

1979

- 136 "General introduction", *Faraday Discussions of the Royal Society of Chemistry* 68.

1980

- 137 "On the possible effect of growth-layering on optical symmetry in cubic crystals", *Philosophical Magazine* 41B, 699-701.
- 138 with S. Chandrasekhar. "Evidence of a tilted columnar structure for mesomorphic phases of benzene-hexa-n-alkanoates", *J. Physique* 41, 1285-1288.

1981

- 139 "Edge dislocations as crystal growth sources", *J. Crystal Growth* 51, 367-368.

1982

- 140 "Snow crystals", *Contemp. Phys.* 23, 3-22.

1983

- 141 "Introductory remarks", Discussion on "Physics, chemistry and applications of thermotropic liquid crystals", *Phil. Trans. Roy. Soc. Lond.* A309, 71-75.

1984

- 142 "Orientation mapping" in ed. K.H.G. Ashbee, *Proceedings of the European Workshop in Non-Destructive Evaluation of Polymers and Polymer Matrix Composites, Vimeiro, Portugal, 1984*, Technomatic Publishing Co., 1986.

1986

- 143 "The icosahedral orientation manifold as a model for icosahedral close-packing", *J. Physique, Colloque C3, Suppl. No. 7* 47, 165-172.
- 144 with L. Brodsley & J.W. Steeds. "Prince Rupert's Drops", *Notes Rec. Roy. Soc. Lond.* 41, 1-26.

1987

- 145 "Spontaneous breaking of chiral symmetry in the growth of crystal whiskers: an origin for giant screw dislocations", *Philosophical Magazine A.* 56, 263-268.

1988

- 146 "Orientational Mapping", The 1987 Institute of Metals Lecture, *Metallurgical Transactions* 19A.
- 147 "On the Burgers Circuit", *Physica Status Solidi A* 105, K21.
- 148 with A. Keller. "Two-phase separation: modified by a glass transition", *Polymer Communications* 29.