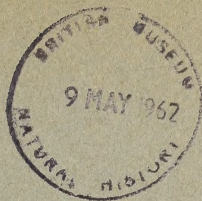


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PROCEEDINGS
OF THE
Bournemouth
Natural Science
Society

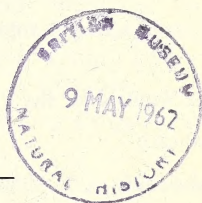
VOL. LI

SESSION 1960-61

Price - Five Shillings

PROCEEDINGS of the

Bournemouth
Natural Science Society



VOL. LI.
SESSION 1960-61

PUBLISHED BY THE SOCIETY AT ITS HOUSE,
39 CHRISTCHURCH ROAD, BOURNEMOUTH, 1961

Contents

Introductory Note	3
Officers and Council, 1961-62	4
Committees, 1961-62	5
List of Members (31st October, 1961)	6
Summary of Accounts for Year ending 30th September, 1961	16
Council Report for Year ending 30th September, 1961	20
Congratulation. Sir Rudolph Peters, M.C., M.A., M.D., F.R.S.	22

Obituary:—

Harold Kemp Stanton	23
---------------------	----

Section Reports for the Year 1960-61:—

Library	24
Museum	24
Garden	25
Archaeology and History	25
Astronomy	27
Botany	27
Entomology	28
Geography	29
Geology	30
Microscopy	31
Photography	31
Physics and Chemistry	32
Zoology	33
Ciné Film Programmes	34
Club Days	35

Presidential Address for the Year:—

“The Contribution of Cambridge to Current Cosmological Controversy” by W. P. Winter, B.Sc.	36
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Introductory Note

The objects of the Society are declared in the second of its Rules to be "the promotion of the study of Science in all its branches, and of Public Education, by means of Lectures, Field Meetings, the reading and discussion of Papers, and in any way that the Council of the Society shall deem advisable."

The branches of Science at present represented are as follows:—**Archaeology and History, Astronomy, Botany, Entomology, Geography, Geology, Microscopy, Photography, Physics and Chemistry, and Zoology.**

During the **Winter Session**, from October to April, frequent meetings are held, comprising Lectures on subjects of scientific interest, illustrated by lantern slides, films, epidiascope, diagrams, specimens, and experiments.

Throughout the **Summer Session**, Field Meetings on an average of two or three a week, are held in suitable places in the neighbourhood of the town, or Coach and Train Tours are arranged to districts of scientific interest at a distance.

The management of the Society is vested in a Council, which is elected at the Annual General Meeting.

The Society possesses a Library available for the use of members. Books may be borrowed by members, and there is a Reading Room in which works of reference may be consulted. The Museum contains many valuable scientific collections and specimens. The Library and the Museum serve to illustrate and illuminate the ten Sections of the Society. There is a well-equipped Dark Room for the use of members interested in Photography. The house stands in a pleasant garden of over an acre.

Members are elected by the Council, and pay an annual subscription of £1 10s. 0d. for full membership, or £15 for Life Membership. An Entrance Fee of 5/- is payable upon nomination for election. The Family Subscription (for members of a family living in the same house) is as follows:—First Adult Member, £1 10s. 0d.; Second Adult Member, £1; each additional Adult Member, 10/-; Children between 12 and 18 years, 10/- (Associate Members). Members living six miles or more from 39 Christchurch Road pay half the above rates. Renewable monthly membership, 5/-, is available.

A bi-monthly Programme, giving full details of all meetings, is posted to every member, and a Volume of Proceedings is published annually, of which adult members receive a copy.

Application Forms for Membership and further particulars may be obtained from the Honorary Assistant Secretary,

G. A. SLATER,
6 Wyndham Road,
Parkstone, Poole,

Bournemouth Natural Science Society

OFFICERS AND COUNCIL FOR 1961-62

N.B.—University and other qualifications are only attached at first mention of names.

President

W. P. WINTER, B.SC.

Chairman of Council

H. V. HARRIS

Deputy Chairman of Council

MISS D. M. LOWTHER, B.SC.

Council

THE OFFICERS AND CHAIRMEN OF SECTIONS (*ex-officio*)

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M. H. COCKE	MRS. I. SEWELL
H. DE CASTRO	G. A. SHILLIDY, C.I.E.
D. J. DUDLEY	MRS. W. BOYD WATT, F.Z.S., M.B.O.U.
A. A. FOYLE	A. E. WITHERS
G. HOLROYD	W. J. WOODHOUSE, A.C.P.
MISS A. KING	MRS. M. P. YULE

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 Astronomy: W. P. WINTER, B.SC.
 Botany: MRS. A. K. HUNT, B.SC.
 Entomology: W. S. I. COX, F.R.E.S.
 Geography: MISS F. M. EXTON, B.A.
 Geology: D. A. WRAY, PH.D., M.SC., F.G.S.
 Microscopy: A. J. AIERS
 Photography: MISS U. M. OGLE
 Physics and Chemistry: H. E. CLARKE, M.A., B.SC., F.R.I.C.
 Zoology: H. V. HARRIS

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Hon. Programme Secretary: A. CHARTER

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Hon. Solicitor

G. A. TURNER

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Hon. Treasurer: F. J. WOOD *Hon. Secretary:* T. H. BICKEL

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W. J. READ, G. A. SLATER, A. E. WITHERS, W. J. WOODHOUSE, D. A. WRAY

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Chairman: J. H. BAILEY

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MRS. J. B. E. LOCKE, MRS. W. PERCEVAL

Museum:

Chairman: W. L. WHITTLE

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Chairman: J. H. BAILEY

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G. HOLROYD, MISS F. H. WARDEN, W. P. WINTER

Tea:

Chairman: MISS A. KING

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MRS. G. LOGIE, MRS. M. E. POWIS, MISS W. A. SAUNDERS,
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Bournemouth Natural Science Society

List of Members

Revised to 31st October, 1961

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OORIGINAL MEMBER
VVICE-PRESIDENT

WGILBERT WHITE FELLOWSHIP
†PAST PRESIDENT
LLIFE MEMBER

AASSOCIATE MEMBER

The year of election is given before the name of each member

1952	Adam, Miss A. Irvine	17 Linwood Road
1961	Adams, D. T., M.A.	13 Sandy Mead Road, Queen's Park
1961	Adams, Mrs. M.	"
1955	Adams, Mrs. K. L.	1 Gleneagles Avenue, Parkstone.
1958	Agar, R.	84 Howard Road
1959	Aiers, A. J.	Maasdam, Golf Links Road, Ferndown
1959	Aiers, Mrs.	"
1961	Aiers, Miss E. M.	Flat 2, Earlston, 8 Portarlington Road
1958	Allen, Mrs. F. C.	8 Twynham Road, Southbourne
1960	Alsford, C.	Long Field, Church Road, Ferndown
1960	Alsford, Mrs. J. R.	"
1956	Ambler, Lieut. Col. M. J.	Min's Cottage, 5a Branksome Wood Road
1955	Ambler, Mrs. A.	"
1958	Andrews, Dr. G. F., M.R.C.S., L.R.C.P., D.P.M.	Winster, 20 Elgin Road
1957	Arnold, L.	11 Danecourt Road, Parkstone, Poole
1957	Arnold, Mrs. E. L.	"
1952	LAtkinson, Mrs. A., S.R.N.	40 Palmer Road, Oakdale, Poole
1950	Bailey, J. H.	39 Strouden Avenue
1950	Bailey, Mrs. A. A.	"
1955	Bailey, Miss F. E. L.	57 St. Catherine's Road, Southbourne
1955	Bailey, Miss G. L.	"
1961	Baker, Miss J.	37 The Avenue, Moordown
1955	Balch, Miss M. M., M.B.E., B.A.	42 Saxonbury Road, Southbourne
1957	Baly, Miss O. M.	70 Brackendale Road
1956	Bamber, Mrs. C. T.	Walhampton Cottage, Lymington
1936	*Banham, Miss E.	"Redlands", Mornish Road, Branksome Park, Bournemouth West
1951	Barker, Mrs. E.	21b Upton Way, Broadstone
1957	Barton-Bullock, Mrs. L.	2 Ravenscourt Road, Southbourne
1956	Bartrop, W. T. C., B.COMM.(LOND.), J.P.	11 Penrith Road, Boscombe
1956	Bartrop, Mrs. M. L.	"
1944	Bell, T. M., B.A., M.B., B.CH., M.R.C.S., L.R.C.P.	5a Stourwood Avenue, Southbourne
1941	Bell, Mrs. R. M.	"
1942	Bennett, Miss D.	Caradon, Canford Cliffs Avenue, Park- stone, Poole
1942	Bennett, Miss M.	"
1960	Bennett, Mrs. J. K. M.	9 Moor Vale Road, Moordown
1947	Berrill, Miss M. E.	Russell Court Hotel, Bath Road
1942	Bickel, T. H.	10 Ormonde Road, Branksome Park
1960	Binns, Miss M. E., M.R.C.S., L.R.C.P.	The Lighthouse, Hurn Road, Ringwood
1951	wBlack, Mrs. E.	69 Grosvenor Street, London, W.1
1946	Blackmore, H. C., L.D.S., R.C.S.	15 Keswick Road, Boscombe
1946	Blackmore, Mrs. E. E.	"
1960	Blades, Mrs. S. A.	1 Bodorgan Road "
1950	Bland, Mrs. S.	1 Sandringham Road, Parkstone, Dorset

- 1955 Blicq, Miss G. Merlyn, Marine Drive, Barton-on-Sea, Hants
- 1954 Boggust, A. E. V. 307 Iford Lane
- 1960 Boite, E. E. G. 17 Browning Avenue, Boscombe Manor
- 1950 Bone, Miss M. R. M. 28 Westbourne Park Road
- 1957 Booth, Mrs. L. 41 Cedar Avenue, Christchurch, Hants
- 1956 Boulton, Miss L. 2a Stour Road, Queen's Park
- 1956 Brain, Miss C. M. 16 Knole Road
- 1960 Brewer, Mrs. E. G. St. Clair 12 Lonsdale Road
- 1959 Bruford, Mrs. E. 113 Alumhurst Road, Westbourne
- 1920 Brumell, Miss M. 7 Windermere Road
- 1960 Brunstrom, Mrs. J. B. 6 Bradburne Road
- 1961 Bugg, Miss F. K. 15 Grosvenor Road, Bournemouth West
- 1951 wBull, A. W. M., C.B. Broom House, Chiltern Road, Hitchin
- 1961 Bullock, J. C. 4 Fernbank, St. Stephen's Road
- 1922 Burton, E. St. J., F.G.S., F.R.S.A. St. Anne's, Seaward Avenue, Barton-on-Sea
- 1930 Bury, Miss G. J. Flat 4, Berne Court, Grove Road
- 1946 Busby, Miss G. 4 Harbour Close, Haven Road, Canford Cliffs
- 1952 Butcher, A. J., F.R.I.B.A. "Hilton", Dudsbury Avenue, Ferndown.
- 1957 Butler, G. W. Old Park Farm, Lytchett Matravers, Dorset
- 1960 Butler, Mrs. Old Park Farm, Lytchett Matravers
- 1954 Byrt, A. H., C.B.E. 14 St. Winifred's Road
- 1953 Cadwell, W. H., M.I.C.E. 238 Higher Blandford Road, Broadstone, Dorset
- 1953 Cadwell, Mrs. D. A. Virginia "House, Langton Matravers
- 1928 LCalkin, J. B., M.A., F.S.A. 7 Viking Way, Southbourne
- 1958 Capstick, F., F.I.A.C. "
- 1958 Capstick, Mrs. W. 67 Chatsworth Road "
- 1955 Caswell, G. E., M.B.E., M.C. 18b Milton Road "
- 1955 Caswell, Mrs. K. " "
- 1943 †vChambers, Ernest, F.L.S. Stratton Audley, 2 Tower Road, Bournemouth West
- 1950 Chambers, Mrs. E. " "
- 1955 Chambers, Miss H. M. Flat 3, 1 Cavendish Place
- 1959 Charter, A. The Ken, "Walkford, "Christchurch
- 1959 Charter, Mrs. E. E. 37 Sunnyhill Road, West Southbourne
- 1945 Cheesman, Mrs. A. 2 Shaftesbury Road
- 1945 Child, Miss L. M. 6 Alyth Road
- 1912 *Chilver, Miss K. M. The White House, Colebrook Street, Winchester
- 1951 Chomé, E. E. P. South Lodge, Rope Hill, Boldre, Lymington, Hants.
- 1942 Chomé, Mrs. W. 4 Gardens Court, Parkstone Road, Poole
- 1950 Churches, Mrs. E. W., M.B., CH.B. "
- 1958 Clarke, Miss A. M., B.A. The Manor House, Fovant, Wilts
- 1945 †vClarke, H. E., M.A., B.S.C., F.R.I.C. 18a Penn Hill Avenue, Parkstone, Dorset
- 1945 Clarke, Mrs. M. 33 Cavendish Road
- 1927 *Clay, R. C. C., M.D., F.S.A. Hazelhurst, Sway
- 1958 Cocke, M. H. Empress Hotel, Exeter Road
- 1961 Coe, Mrs. G. White Lodge, 8 Oban Road
- 1946 Cohen, E., F.Z.S., M.B.O.U. "
- 1951 Coleman, F., M.C., M.R.C.S., F.D.S. "
- 1926 *Cooper, H. A. "
- 1941 LCooper, Mrs. E. M. "
- 1951 LCooper, Miss R. I. "

- 1945 Cooper-Hunt, Major C. L., 40 Marine Drive East, Barton-on-Sea
M.A., R.A.CH.D. (Retd.)
- 1945 Cooper-Hunt, Mrs. E. G. BM/FFQP, London, W.C.1
- 1957 Corby, J. W. 8 Redhill Crescent, Moordown
- 1952 Corser, Miss G. M. Chantelle, 10 Dulsie Road, Talbot Woods
- 1956 Cox, Miss M. G. E. 248 Castle Lane
- 1948 Cox, W. S. I., F.R.E.S.
- 1948 Cox, Mrs. " "
- 1956 Crawshaw, Mrs. M. 2 Spring Slade, Cliff Drive, Canford Cliffs
- 1903 *O Curtis, W. Parkinson, F.R.E.S. 131 Princess Road
- 1959 Cuthbertson, Miss E. 179a Richmond Park Road
- 1959 Cutland, W. South Riding, Honey Lane, Burley, Hants.
- 1959 Cutland, Mrs. H. M. " "
- 1961 Dale, Mrs. L. D. 401 Holdenhurst Road
- 1960 Dalrymple-Watt, Lady G. V. 1 Berwick Road, Talbot Woods
- 1959 Danne, Miss E. M. M. Flat 5, 12a Branksome Wood Road
- 1961 Dawson, J. E. 17 Westwood Avenue, Ferndown
- 1961 Dawson, Mrs. H. E. " "
- 1952 Day, Mrs. E. T. 10 Barton Gardens, Dawlish, Devon
- 1955 Deakin, R. H., M.S.C. Coppins, Harvey Lane, Canford Magna, Wimborne
- 1960 Deakin, Mrs. E. M. " "
- 1957 Dear, Miss D. 23 Burnham Drive " "
- 1930 *de Castro, H. "Yarlington", Springdale Avenue, Broadstone
- 1935 Derry, Mrs. H. E. Charnwood, 146 Belle Vue Road, Southbourne
- 1947 Dewdney, H., F.R.C.O., L.R.A.M. 15 Wellington Road
- 1961 Dixon, Sir Arthur, Bourne Hall Hotel, Westbourne
C.B., C.B.E., B.A.
- 1961 Dixon, Mrs. H. M. 3 Richmond Park Crescent, Boscombe
- 1949 Dixon, Miss H. Meyrick Grange Hotel, 62 Christchurch Road
- 1960 Dobbie, Miss C. E. The Lighthouse, Hurn Road, Ringwood
- 1958 Domney, Miss M. 5 Harbour Close, Canford Cliffs
- 1960 Dool, Mrs. N. M. 55 East Howe Lane
- 1960 A Dool, Miss J. P. M. " "
- 1961 Draper, Mrs. G. 51 Branksome Wood Road
- 1953 Dudley, D. J. 17 Widdicombe Avenue, Parkstone, Poole
- 1955 Dudley, Mrs. I. " " " "
- 1953 Eaton, Mrs. V. W. 33 Branksome Wood Road, Bournemouth West
- 1956 Edmonds, Miss K. E. 74 Namu Road, Winton
- 1960 Edwards, Mrs. F. M. "Georgian House", 2 Priory Road
- 1960 Elliott-Lockhart, Mrs. D. F. E. 41 Wellington Road
- 1946 Ellison, Prof. F. O'B., M.D., Pine Apple Cottage, Burton
F.R.A.S.
- 1956 Elwell, Miss G. Noahs Ark Cafe, Dunstable, Bedford
- 1961 Engel, E. C. 53 Alum Chine Road
- 1950 Evans, Mrs. E. M., B.A. 113 Western Avenue, Ensbury Park
- 1954 Evans, W. J., B.A., B.S.C., 19 Kingsway, Ferndown, Wimborne,
F.R.G.S. Dorset
- 1955 Exton, Miss F. M., B.A. 39 Branksome Wood Road
- 1960 A Exton, Miss J. M. " "
- 1959 Falvury, P. Alpine, "Warren Road", Bournemouth W.
- 1919 Farmar, Mrs. K. A. Whitton Lodge, Stevenson Crescent, Parkstone, Poole
- 1922 Farmar, Miss E. A. " "
- 1953 Farwell, Mrs. S. M. A. Latch Farm, Fairmile, Christchurch
- 1956 Fergusson, Mrs. C. 708 Christchurch Road, Boscombe
- 1957 Fiddes, Mrs. I. A. Tetherdown, Cull Lane, New Milton, Hants.

- 1960 Filer, Miss A. N. 34 Harewood Avenue, Boscombe East
 1934 Finnis, Miss F. M. 27 Julian's Road, Wimborne
 1951^{†vw} Fisher, J. The Old Rectory, Ashton, Northampton
 1957 Fishlock, H. W., B.Sc. 319 Belle Vue Road, Southbourne
 1957 Fishlock, Mrs. F. Teelings "Cottage, South Baddesley", Lym-
 1950 Fletcher, Mrs. V. ington
 1954 Follett, Mrs. V. Windward, Stevenson Crescent, Parkstone,
 Poole
 1942 Ford, Miss C. 13 Beaufort Road, West Southbourne
 1945 Foyle, A. A. "Therapeia", Wilderton Road, Brank-
 some Park
 1957 Francis, Miss E. G. Beverley, Barton Lane, Barton-on-Sea
 1953 Fraser, Miss M. H., B.A. 2 Ken Road, Southbourne
 1960 Gahan, Mrs. M. 215 Holdenhurst Road
 1961 Galbraith, T., J.P. 71 Carbery Avenue, Southbourne
 1957 Galbraith, Mrs. A. 71 Carbery Avenue, Southbourne
 1956 Gandy, Mrs. L. 11 Cranleigh Gardens, Southbourne
 1955 Gardiner, P. C., F.R.I.C., 61 Orphir Road
 M.I.CHEM.E., M.INST.GAS.E.
 1961 Gee, Dr. Ed. R., 3 Felton Crescent, Highcliffe
 M.A., SC.D., D.K., F.G.S.
 1961 Gordon Gerrard, Cdr. Wm., 4 Astell Street, London, S.W.3
 R.N.
 1961 Gerrard, Mrs. S. T.
 1961 Gibbs, Mrs. D. A. 37 Stirling "Road" "
 1951 Goddard, Miss E. F. 215 Holdenhurst Road
 1959 Gompel, M. E. 12 Chigwell Road
 1937 Gompel, Mrs. M.
 1960 Good, Emeritus Prof. Ronald, 73 Orchard Avenue, "Parkstone"
 D.S.C., M.A.
 1960 Good, Mrs. P. G.
 1949 Goodhart, Mrs. M. West Thorpe, Lymington
 1956 Goodman, Miss J. R. Kenora, 6 Pine Wood Road, Branksome
 Park
 1961 A. Gordis, J. c/o Mr. Trott, 5 Keith Road, Talbot
 Woods
 1942 Gorringe, Miss K. M. 11 Branksome Dene Road, Westbourne
 1956 Graham-Vine, Mrs. F. E. The Angles, Westcliff Gardens
 1960 Grattan, Miss L. T. Tower Cliff Hotel, West Cliff
 1953 Gray, Miss E. 44 Edmondsham House, Terrace Road
 1956 Green, Miss G. M. 17 Clifton Road, Parkstone, Poole
 1944 Greg, Mrs. F. L. 9 Hengist Road, Boscombe
 1955 Gregory, Mrs. L. G. Flat 2, 4 Manor Road
 1957 Griffin, Miss M. J. E. 19 Corhampton Road, Boscombe
 1961 Guthrie, M. 16 Ashford Road
 1961 Guthrie, Mrs. I. H.
 1941 Gwyther, W. T. 12 Foxholes Road, Southbourne
 1956 Habershon, Miss E. M. Leas Court, Cliff Drive, Canford Cliffs
 1931 Haines, Mrs. E. M. Appleslade, Linwood, Ringwood, Hants
 1951 Haines, Miss G. M. "
 1951 Haines, Miss R. M. "
 1961 Haines, Miss E. S. "Little "Orchard", "Godshell, Fording-
 bridge, Hants.
 1957 Halliday, Mrs. M. G. 20 Meyrick Park Crescent
 1953 Hancock, Mrs. C. E. 912 Castle Lane East, Iford
 1959 Hannam, B., M.P.S. Windyridge, Bashley, New Milton, Hants.
 1955 Hannam, Mrs. W.
 1959 Hards, Mrs. D. K. 23 St. Paul's Road
 1960 Hardy, Miss L. H. 20 The Grove, Redhill Park
 1951 Harlock, Miss M. L. 44 Heather View Road, Branksome

1961	Harlock, R. L.	1 Stourwood Avenue, West Southbourne
1961	Harlock, Mrs. M. O.	"
1955	Harris, H. V.	Monterey, Lone Pine Drive, Ferndown, Dorset
1958	Harris, Mrs. W. I.	"
1958	Hart, Miss C. L., S.R.N., C.M.B.	The Thatched Cottage East, Godwin's Croft, Bransgore, Hants
1961	Harvey, Dr. Mrs. F. E., M.B., CH.B.	C21, San Remo Towers, Boscombe
1959	Harvey, Miss G. E. J.	50 Alum Chine Road
1932	*Hatton, Mrs.	Dutch House, Cliff Road, Barton-on-Sea
1951	Hawker, Mrs. E.	64 Alumhurst Road
1961	Hawthorne, S. H.	1 Gresham Road, Winton
1949	Hayley, Miss V. G.	Sandykeld Hall, Manor Road
1951	Hayman, Miss M. S.	39 Queen's Park South Drive
1960	Hearn, Miss I. D.	36 Brackendale Road
1956	Heath, Mrs. C. J.	2 Richmond Court, Hawkwood Road, Boscombe
1954	Henderson, Miss V.	19 Ashmore Avenue, Hamworthy, Poole, Dorset
1954	Hermon, J. A.	43 Stourcliffe Avenue, Southbourne
1961	Herring, Mrs. J. M.	6 Hope Lodge, 6 Belle Vue Road, Lower Parkstone
1961	Higgs, Miss D. H.	"White Gates", 1036 Ringwood Road, West Howe
1952	Hilton, Mrs. D.	East Dyke, Higher Clovelly, Bideford
1956	Hinton, Miss E. M.	1 Lonsdale Road
1961	Hodgson, Miss N.	45 Howard Road
1960	Holbrook, H. S., B.SC., M.I.E.E., FEL.A.I.E.E.	Brinklea Cottage, 10 Wimborne Road
1952	Holroyd, G.	4 Beechey Road
1957	Hunt, W. H.	Flat 1, 5 Alton Road, Parkstone
1954	Hunt, Mrs. A. K., B.SC.	" "
1952	Imlach, Mrs. M. G., B.A.	Crofton, 2 Redcotts, Wimborne, Dorset
1954	Irwin, J. V.	16 Duncliff Road, Southbourne
1954	Irwin, Mrs. B. C.	" "
1959	Jackson, Miss M.	1360 Christchurch Road
1933	James, Mrs. M. G.	70 St. Alban's Avenue
1960	James, W. S.	Oaklea, 115 Tuckton Road, Southbourne
1945	Jenkins, Miss P.	Hawkhurst Court, Wisborough Green, Sussex
1957	Jenoure, Miss C. A.	Eagle Crest, Belle Vue Road, Parkstone, Poole
1957	Jenoure, Miss D.	"
1958	Johnson, H. N.	30 Canford Cliffs Road, Parkstone "
1961	Johnston, Dr. M. D.	241 Charminster Road
1956	Keith-Walker, S.	Hawkley, Lower Pennington Lane, Ly- mington
1956	Killihier, Miss F. I.	Cliff End Hotel, Manor Road
1928	Kendall, Miss G. J., A.R.C.M.	20 Serpentine Road, Poole
1946	King, Miss A.	11 Frances Road
1944	Kirke, Miss M.	Flat 3, Fairthorne Court, 27a Bodorgan Road
1948	Knight, Miss A.	9 Fairview Road, Broadstone
1959	Knight, Miss J.	106 Petersfield Road
1956	Knight, Miss M. E.	24 Lansdowne Road
1952	Lacey, Miss M. A.	10a Wimborne Road
1959	Lake, Miss M., B.A.	43 Stirling Road, Winton
1960	Lamplough, Miss D. C. M.	37a The Avenue, Moordown
1961	Lane, Miss M.	107 Commercial Road, Parkstone, Poole

- 1950 Lanning, J. P.
 1950 Lanning, Mrs. C. M.
 1956 Lavender, J. H., B.S.C., A.R.C.S.
- 1959 Lawes, A. V.
 1959 Lawes, Mrs. K. M.
 1958 Leeland, Mrs. F.
 1960 Lees, Miss E.
 1948 Leonard, Mrs. N.
 1957 Le Roy, Miss E. S. H.
 1957 Le Roy, Miss M. C. G.
 1958 Le Sueur, Mrs. D. G.
 1961 Lewis, Miss D. M.
 1960 Lightfoot, B., O.B.E.,
 M.C., M.A., F.G.S.
 1951 Lloyd, G. B., B.A.
 1950 Locke, G. S.
 1950 Locke, Mrs. J. B. E., B.A.
 1947 Logan, Miss A.
 1952 Logie, Mrs. G.
- 1939 Lowde, Miss E., B.A.
 1951 wLowe, Mrs. D. M.
- 1934 †Lowther, Miss D. M., B.S.C.
- 1951 wLyver, Mrs. D. J.
- 1956 Maddox, Mrs. L. M.
 1960 Mann, B. C.
 1960 Mann, Mrs. F. A. D.
 1960 Manser, Mrs. C. M.
- 1959 Mariette, Miss G. A.
 1956 Marks, Miss K. M.
- 1948 Markwick, Miss D.
 1946 Marshall, Miss D.
 1954 Marshallsay, Miss E. N.
 1954 Marshallsay, Miss L. E.
 1958 Mate, Mrs. F.
 1957 Mathews, Miss G. B.
 1960 Maxted, Mrs. G. E.
 1960 Maynard, Miss A.
 1950 Mayo, H. C.
 1950 Mayo, Mrs. S. E.
 1956 McClay, H.
 1956 McClay, Mrs. A. E.
 1953 McKeown, Miss K. E.
 1961 McLeish, Mrs. M. B., B.S.C.
 1950 Meggett, Lt. Col. E. E., V.D.
 1950 Meggett, Mrs. K. M., M.B.E.
 1956 Middlemast, A. H.
 1956 Middlemast, Mrs. M.
 1958 Middleton, Mrs. J. M., B.S.C.
- 1956 Mills, Miss N.
 1959 Mitton, J. C., A.C.A.
 1957 Moore, W.
 1961 Moore, W. J.
 1961 Moore, Mrs. M.
 1959 Morgan, Commander S. T.,
 O.B.E., R.N. (RETD.)
 1959 Morgan, Mrs. V.
- 78 Lyndhurst Road, Exmouth, Devon
 Heather "Lodge, Bransgore, Christchurch,
 Hants
 48 Seafeld Road, Southbourne
 34 Noel "Road, Wallisdown
 9 Park Court, Western Road
 1 Neville Court, Derby Road
 Forest Mead, Tyrell's Ride, Burley, Hants
 49 Wellington Road " "
 150 Mudeford Cove, Mudeford
 Bingley Farm Lane, Barton-on-Sea
 58 Glenferness Avenue
 85 Seafeld Road, Southbourne
 " "
 157 Southcote Road "
 Flat 4, St. Stephen's Mount, Richmond
 Hill
 83 York Road, Broadstone
 43 Marryat Road, Wimbledon, London,
 S.W.19
 Lonsdale, 15 Mayfield Avenue, Parkstone,
 Poole
 Grove Lodge, Burgess Hill, Sussex
 31 Egerton Road, Queen's Park
 48 Keith Road
 1 Spring "Slade, Cliff Drive, Canford
 Cliffs
 4 Mansfield Avenue, Parkstone
 11 Ennerdale Road, Kew Gardens, Rich-
 mond, Surrey
 67 Norton Road, Winton
 76 Palace View, Bromley, Kent
 6 Overcliff Mansions, 1 Manor Road
 " "
 8 Clifton Road, Parkstone, Poole
 25 Wingfield Court, Manor Road
 2a Wilfred Road, Boscombe
 24 Marlborough Road
 18a Elgin Road
 " "
 64 Blake Dene Road, Lilliput, Poole
 " "
 15 Ravine Road "
 The Chestnuts, Bransgore, Christchurch
 14 Southlea Avenue, Southbourne
 " "
 86 Hengistbury Road, Southbourne
 " "
 Horn Cottage, N. Bockhampton, Christ-
 church
 20 Marlborough Road
 3 Gainsborough Road
 139 Alder Road, Parkstone, Poole
 Redlands, 25 Knyveton Road
 Bracken "Cottage, Blissford, Fording-
 bridge, Hants.
 " "

- 1961 Morris, Mrs. J.
 1955 Moss, C. A.
 1951 wMundy, Miss M. E.
 1935 Muspratt, Mrs.
 1961 Myers, A.
- 1959 Neave, Commander G. H.,
 M.B.E., R.N. (RETD.)
 1959 Neave, Mrs. E. L.
 1960 Nelson, A., F.C.A.
 1939 Newsome, S. H.
 1939 Newsome, Mrs. E. C.
 1954 Newton, Mrs. K. F.
 1943 LNicholls, Miss G.
- 1929 Ogden, Miss E.
 1948 Ogden, F.
 1948 Ogden, Mrs. G.
 1950 Ogle, Miss U.
 1960 Ollier, G.
- 1960 Ollier, Mrs. B.
 1959 Oppé, E. F.
- 1948 Osborne, Mrs. B. E.
 1950 Owen, J. S.
 1944 Owen, Mrs. E.
- 1958 Page, W. E., M.A. (Cantab.)
 1945 Paris, Lt.-Col. A., R.E. (ret'd)
 1956 Paris, Mrs. G.
 1960 Parsons, Mrs. W.
 1916 *LPenrose, Miss F.
 1916*L†vPenrose, Miss M., B.Sc.
 1948 Perceval, Mrs. W.
 1960 Perry, C. C.
 1959 Perry, Mrs. K. E.
 1961 Pesterfield, Miss M.
 1950 †Peters, Sir R. A., M.C., M.A.,
 M.D., F.R.S.
- 1961 Phillips, P. P., PH.D., F.R.I.C.
 1961 Phillips, Mrs. V. A. D.
 1953 Pickering, V. T.
 1953 Pickering, Mrs. C. G.
 1959 Pierce, Mrs. E. K.
 1960 Piggott, H. E., O.B.E., M.A.
 1961 Pinnick, A. W.
 1961 Pinnick, Mrs. O. P. P.
 1959 Piper, P. J., F.R.I.C.S.
 1959 Piper, Mrs. M. G.
 1955 Porter, Miss D. A.
 1957 Powis, Mrs. M. E.
 1960 Price, Miss A.
- 1946 Prideaux, Mrs. A.
 1946 Prideaux, Miss C.
 1958 Prince, Mrs. D. E.
- 1951 wQuillet, L. A.
- 1953 Rayment, Miss S. M.
- 1951 Rayson, Mrs. M. C. J.
- 37 Stirling Road
 Flat E41, San Remo Towers, Boscombe
 56 Lancaster Gate, London, W.2.
 25 East Avenue
 25 Gresham Road
- 5 Grange Court, Gervis Road
- ”
 65 Alyth Road, Talbot Woods
 184 Belle Vue Road, Southbourne
- ” ”
 2 Montagu Road, Boscombe
 17 Waltham Road
- 1 Rossini Cottage, Hedgemead, Bath
 30 Grosvenor Court, Vale Road
- ” ”
 2 Frankland Crescent, Parkstone
 Rowans, 202 Harewood Avenue, Queen's
 Park
- ” ”
 “Peakey”, Worth Matravers, Swanage,
 Dorset
 B6, San Remo Towers, Boscombe
 2 Rotherfield Road, Boscombe
- ” ”
- 53 Petersfield Road, Boscombe East
 11 Stourwood Road, Southbourne
- ” ”
 50 Alum Chine Road, Westbourne
 Little Picket, Hightown, Ringwood
- ” ”
 7 Benellen Avenue
 15 Seafeld Road, Southbourne
 7a Elms Avenue, Parkstone, Dorset
 56 Gresham Road
 3 Newnham Walk, Cambridge
- 87 Bath Hill Court
- ” ”
 Francesca, Hightown, Ringwood, Hants
- ” ”
 4 Mansfield Avenue, Parkstone
 29 Harvey Road, Boscombe
 Strudes Farrington, Blandford, Dorset
- ” ”
 8 Leigham Vale Road, Southbourne
- ” ”
 Deveron Lodge, 2b Christchurch Road
 37 Wheaton Road, Pokesdown
 Alma Cottage, Ringwood Road, Fern-
 down, Dorset
- Upmoor, Ravine Road, Canford Cliffs
- ” ”
 56 Alyth Road, Talbot Woods
- ” ”
 “Sevenoaks”, Springfield, Chelmsford
- A7, San Remo Towers, Sea Road, Bos-
 combe
- 5 Marston Road, New Milton, Hants

- 1945 †vRead, W. J., M.Sc., F.R.I.C. 15 Carbery Avenue, Southbourne
 1951 Read, Mrs. H. A. " "
 1957 Reakes, Rev. G. S., B.A. The Chalet, 21b Prince of Wales Road
 1957 Reakes, Mrs. K. A. " "
 1956 Reynolds, C. R. 14 Foxholes Road, Southbourne
 1945 Richards, Miss E. E., B.Sc. 8 Overcliff Mansions, Manor Road
 1942 Richards, Miss M. C. Stour Lodge, 21 Julian's Road, Wimborne
 1958 Ridsdale, Mrs. M. 14 Erinbank Mansions, Manor Road
 1949 Robertson, Mrs. M. 41 Christchurch Road
 1954 Robertson, Miss V. L. 2 Berry Court, St. Peter's Road
 1949 Robertson, Mrs. W. M. 58 Robert Louis Stevenson Avenue, West-
 bourne
 1953 Robins, F. W., F.S.A., F.R.G.S. 4 Harewood Avenue, Boscombe
 1923 Roden, Miss E. M. 12 Walpole Road, Boscombe
 1947 Rooke, Dr. K. B., M.B., B.Ch., M.B.O.U. Cranbourne, Wimborne
 1960 Rose, J. 120 Gladstone Road, Boscombe
 1959 Rowe, Miss F. 23 Stourcliffe Avenue, Southbourne
 1951 wSalisbury, Sir E., D.Sc., F.R.S., F.L.S. Croindene, Strandway, Felpham, Bognor
 1954 Saunders, Miss W. A. Regis, Sussex
 1960 Scorer, Miss M. G. 11 Portman Crescent, Boscombe
 1938 Seare, Mrs. H. 53a Browning Avenue, Boscombe
 1951 wSecretan, S. D. Almer, Blandford
 1950 Sedgewick, Mrs. G. Swaines, Rudgwick, Sussex
 1960 Sephton, Mrs. N., M.B., Ch.B. 46 West Cliff Road
 1951 Sewell, Mrs. I. Flat 1, 4 Talbot Avenue
 4 Maundeville Crescent, Christchurch,
 Hants
 1941 Sexton, Miss F. 60 Uplands Road
 1933 Sheffield, Miss I. E. 6 Lonsdale Road
 1950 Shillidy, G. A., C.I.E. Flat No. 10, 31 St. Peter's Crescent
 1944 LShorthouse, B. Brookside Cottage, Exeter Lane
 1937 Simmons, Mrs. I. M. 73 Spur Hill Avenue, Parkstone, Poole
 1920 Simpson, N. Douglas, M.A., F.L.S., F.R.M.S. 3 Cavendish Road
 1961 Sims, P. W. 22 Duncliff Road, Southbourne
 1961 Sims, Mrs. P. W. The White House, 6 Wyndham Road,
 Parkstone; Poole
 1959 Slater, Mrs. E. M. 133 Seafiel Road, Southbourne
 1959 Sliker, Miss H. R. M. " "
 1960 Smith, Mrs. D. E. 4 Donoughmore Road, Boscombe
 1960 Smith, Miss Mabel, M.B.E., S.R.N. 1a Cecil Avenue, Queen's Park
 1947 Smythe, Mrs. M. Sherwood, 2 Irving Road, Southbourne
 1959 Soar, Miss I. M. 11 Grosvenor Road
 1940 Somerville, Mrs. S. Rumah Kechil, Pinewood Road, Fern-
 down
 1960 Statham, Miss B. The Lighthouse, Hurn Road, Ringwood,
 Hants.
 1956 Stray, J. F. Browngates, Barton Lane, Barton-on-Sea,
 Hants
 1957 Stray, Mrs. S. V. M. " "
 1947 Stuart-Harris, Miss M., B.Sc. Woodways, Merley Lane, Wimborne,
 Dorset
 1946 Stuart-Harris, Miss W., B.Sc. " "
 1960 Sunderland, Mrs. R. B. 18 Spur Hill Avenue, Parkstone
 1950 Sworder, Miss R. c/o Barclay's Bank Ltd., 659 Christ-
 church Road, Boscombe
 1960 Sykes, Mrs. H. M. 16 Amberwood Drive, Walkford, Christ-
 church

- 1960 Withers, Mrs. D. E.
 1961 Witt, A. J. 26 Churchill Road, Boscombe
 1948 A Wood, Miss E. B., B.SC. 4 New Park Road, West Southbourne
 1958 Wood, F. J. 17 Montagu Road
 1951 w Wood, Mrs. L. The Oaks, Sawbridgeworth, Herts.
 1950 Wood, Miss L. 3 Lonsdale Road
 1956 Wood, T. E., M.A., LL.B. 21 Durley Chine Road
 1957 Woodger, Miss M. J. 70 Brackendale Road
 1903 *†ov Woodhouse, W. J., A.C.P., 29 Twynham Road, Southbourne
 M.I.H.
 1957 Woodhouse, Mrs. D.
 1960 Woods, Miss M. Alma Cottage, Ringwood Road, Fern-
 down, Dorset
 1953 Wootton, Miss E. M. 22 Elgin Road
 1949 †v Wray, D. A., M.SC., PH.D., 42 Canford Cliffs Road
 F.G.S.
 1949 Wray, Mrs. A. " "
 1956 Wray, Miss J., S.R.N. " "
 1946 Wycherley, Mrs. L. 2 Gainslea Court, Derby Road
 1960 Yeatman, Mrs. M. Lantern House, Avenue Road, New
 Milton
 1960 Young, Mrs. S. M. Cheltwood, Waterditch, Nr. Christchurch
 1958 Yule, Mrs. M. P. 29 Montagu Road

BOURNEMOUTH NATURAL SCIENCE SOCIETY

Summary of the Accounts for the year ending 30th September, 1961

RECEIPTS		PAYMENTS	
1960	£ s. d.	1960	£ s. d.
Subs. to Sept. 30th, 1961	555 5 0	Caretaker, Wages and Insurance	127 1 2
Subs. to Sept. 30th, 1962	15 0 0	Insurance	35 3 9
Covenant Tax Refund	47 17 3	Maintenance	774 15 1½
	618 2 3	Rates	217 11 0
			1154 11 0½
RENTS, ETC.			
200 0 0 Royal Commonwealth Society	200 0 0	Coal	22 6 0
75 0 0 Camera Club	75 0 0	Electricity	65 4 9
35 0 0 Other Accommodation	17 10 0	Gas	129 9 3
9 8 0 Hire of Hall, etc.	8 8 0	Water	7 2 6
11 3 9 Royal Commonwealth Society—Gas refund	9 9 3	Postages	39 13 2½
— Tudor House Appeal	5 0 0	Printing and Stationery	127 5 8½
6 3 10 Telephone	7 2 2	Proceedings	67 0 0
1 5 0 Projector Fees	1 5 0	Telephone	29 14 0
15 0 Lantern	—		263 12 11
— Sundries	4 0 0	Field Meetings	15 0 0
	327 14 5	Library	8 7 5
34 10 0 Field Meetings (refunds)	31 12 0	Garden	40 17 6
65 9 1 Garden Party	52 11 9	Museum	—
15 3 0 New Year Party	12 14 7		64 4 11
33 0 10 Teas (net)	29 6 9	Subs. to other Societies	17 4 0
	126 5 1	Sundries	178 0 2
3 7 6 Donations	—	Extra Expenses	61 17 6
	—		257 1 8
TOTAL OF ORDINARY RECEIPTS		TOTAL OF ORDINARY EXPENSES	
	1072 1 9		1963 13 0½

PAYMENTS OTHER THAN ORDINARY

113 10 8	Interest on Investments	255	4	3
25 9 7	Interest (Income Tax Re-fund to 31.3.61)	52	18	1
		308	2	4
	RECEIPTS OTHER THAN ORDINARY			
Nil	Transferred from Deposit Account	7500	0	0
	Balance at Bank, 30.9.60	294	12	4
	Cash in hand 30.9.60	9	9	9
		295	2	1
		<hr/>		
		£9175 6 2		

Nil	£1,200 British Electricity Stock 1974/79	984	4	0
"	£2,500 4% Consols	1631	13	0
"	£2,500 5% Conversion Stock 1971	2093	8	0
"	£600 6% Exeter City Council Mortgage	600	0	0
"	£1600 6% Barking Corporation Mortgage	1600	0	0
		6909	5	0
	Balance at Bank 30.9.61	250	2	0
	Cheque in hand (R.C.S. Rent)	50	0	0
	Cash in hand	2	6	1½
		302	8	1½
		<hr/>		
		£9175 6 2		

We have examined the above Accounts with the Books of the Society and Vouchers for payments and certify the same to be correct.

H. C. MAYO, F. OGDEN, Hon. Auditors.
 F. J. WOOD, Hon. Treasurer.

October 17th, 1961.

FIELD MEETINGS ACCOUNT

Cash in Hand, 30.9.60	£	s.	d.	Expenses Field Meetings	£	s.	d.
From Coaches	6	10	5	Transferred to General Account	31	12	0
	54	10	6	Cash in Hand, 30.9.61	2	17	5½
	<hr/>				<hr/>		
	£61	0	11		£61	0	11

INVESTMENTS

	Cost			Approximate Value			
	£	s.	d.	30th Sept. 1961	£	s.	d.
£1000 3% British Transport Stock 1978/88	775	4	0	558	0	0	
£1000 4½% British Electricity Stock 1974/79	992	1	6	756	0	0	
£ 200 6% County Borough of Bournemouth Mortgage Bond	200	0	0	200	0	0	
£ 500 5½% County Borough of Bournemouth Mortgage Loan	500	0	0	500	0	0	
£ 500 5½% County Borough of Bournemouth Mortgage Loan	500	0	0	500	0	0	
£2500 4% Consolidated Stock	1631	13	0	1465	0	0	
£2300 5% Conversion Stock 1971	2093	8	0	2042	0	0	
£1200 4½% British Electricity Stock 1974/79	984	4	0	906	0	0	
£1600 6% Borough of Barking Mortgage Loan	1600	0	0	1600	0	0	
£ 600 6% Exeter Corporation Mortgage Loan	600	0	0	600	0	0	
	<hr/>			<hr/>			
	£9876	10	6	£9127	0	0	

Council Report for the year ending 30th September, 1961.

On 30th September 1961 our membership was 492 of which 13 belonged to the Gilbert White Fellowship. This figure represents an encouraging increase of 38 during the year.

Council regrets to announce the deaths of the following members during the year: — Mrs. Allison (1960), Mr. W. Barker, B.Sc. (1951), Mrs. A. Brett (1948), Prof. J. Cameron, M.D., D.Sc. (1934), Miss E. Francis (1948), Miss O. T. Hanbury (1951), Miss C. E. C. J. Hurt (1930), Mrs. M. C. R. Kay (1956), Miss A. Penny (1945), Miss M. E. de B. Rix (1926), Mr. H. K. Stanton (1949), Mr. W. R. Williams (1957), Miss C. White (1951). The year, in brackets, denotes the date of joining the Society.

It was with sincere regret that in November of last year Council accepted the resignation through illness of the Hon. Secretary, Mr. G. A. Shillidy. It acknowledges gratefully his enthusiasm and efficiency during his period of office, in particular, his valuable work in respect of office re-organisation. He was succeeded by Mr. T. H. Bickel whilst Mr. G. A. Slater was elected to the position of Hon. Assistant Secretary.

After holding the position of Librarian for a period of 14 years Mr. A. A. Foyle in April last expressed the desire to relinquish this office. This resignation also was received with keen regret and Council wishes to place on record its grateful recognition of Mr. Foyle's success in maintaining the status of the Library as one of the outstanding assets of the Society. Mr. Foyle has been succeeded by Mr. H. S. Holbrook, B.Sc., M.I.E.E., F.A.I.E.E.

Mr. W. A. Stinton having resigned his position as a Society Trustee, Mr. H. V. Harris was appointed in his place.

Mrs. Brett had for some years served the Society devotedly and well in assisting Mrs. Cox with the addressing of envelopes and the regular despatch of the bi-monthly programmes, the Annual Proceedings and other publications. She was one of those who work quietly behind the scenes and to whom the Society owes so much. Council is glad to report that Mr. and Mrs. Cox have undertaken jointly to continue this valuable work which proceeds with such unflinching regularity and efficiency.

By the death of Mr. H. K. Stanton who had for some time been responsible for the Ciné Projection the Society loses a devoted and enthusiastic worker. Although no official appointment has yet been made Council learned with pleasure that Mr. D. J. Dudley had offered to act in conjunction with Mrs. Sewell who, herself, had ably assisted Mr. Stanton in the past.

On November 9th last, before a capacity audience, the President for 1960-61, Mr. James Fisher, M.A., F.L.S., F.Z.S., delivered his Presidential Address "The Gannet Population". The interest of the address was enhanced by the showing of a selection of his own slides.

Interest in the Society lectures, of which there were 53 during the year, was fully maintained. They were well illustrated by films, slides, etc. Club days again provided suitable opportunities for the discussion of Sectional topics and for the inspection of selected museum exhibits. The Ciné Programmes continued to attract large audiences and deservedly so for seldom has Mr. Bailey provided a more interesting or instructive series than those of the past year. Field Meetings, Coach Excursions, etc., 59 in number, also continue to be well supported. The Programme this year included a three-day Field Excursion to Oxford, Stratford, the Welsh Border, Malvern and Bristol. Council acknowledges with gratitude the debt the Society owes to the various Chairmen of Sections who, at the cost of considerable time and effort, plan and carry through these most pleasurable and instructive outings.

Both the New Year and Summer Garden Parties proved again to be happy social occasions, providing as before, a useful and informal meeting point for members new and old. Although the profit fell somewhat below the level of last year—then a record—the number of tickets sold for the Garden Party was the highest yet reached.

Payment of subscription by the Seven Year Covenant Method has again proved of considerable financial benefit to the Society and Council hopes that wherever possible other members will indicate their willingness to follow this procedure. Payment of subscriptions by Banker's Order has also tended to lessen administrative work.

Representatives of our Society have, as hitherto, attended meetings of the British Association, the S.E. Union of Scientific Societies and the Council for British Archaeology. In addition, Mrs. M. P. Yule was appointed our representative and attended the inaugural meeting of the newly constituted "Hampshire Naturalists' Trust".

The benefits of last year's advantageous sale of land are now becoming apparent. The re-organisation of the forecourt and garden has given not only increased parking space but a lawn actually larger than before, while the improved outlook from the South windows of the Museum has been commented on by members. The success of the new garden layout is due in no small measure to the initiative, hard work and enthusiasm of Mrs. Chomé who, throughout the period of reconstruction gave without reserve of her time and skill. Council is warmly appreciative. The opening up of the upper hall has been completed while the kitchen has been reconstructed, enlarged and equipped to meet more efficiently the demands and requirements of the Tea Committee, the ladies of which so regularly and willingly operate this valuable service.

The larger and still more expensive renovation of the exterior of the building is well advanced and other interior matters are now under consideration. These developments—the sale of land and the alterations to garden, premises, etc.—led inevitably to increased

calls upon the services of our Hon. Solicitor, Mr. G. A. Turner, and our Hon. Architect, Mr. A. J. Butcher. The Society's officers were invariably received by Mr. Turner with friendly informality; he gave freely of his time and his advice on all legal questions has proved most valuable. Mr. Butcher's interest in the routine maintenance of our premises needs no emphasis but few outside the officers of the Society are aware of the time, thought and personal attention which he has devoted to the recent work of construction and repair, work which has involved long consultation with the Society's officers, the Planning Authorities and the Building Contractors. To both these good friends of the Society Council extends its warmest thanks.

It is with much regret that Council has to accept the resignations of the Auditors, Mr. H. C. Mayo and Mr. F. Ogden. Mr. Ogden has served in this capacity for nine years, whilst Mr. Mayo has acted with him for five years and also served as Treasurer for four years. Council is deeply indebted to these members and also to those officers, chairmen of sections, members of committees and all those who voluntarily assist in the successful conduct of the Society. They generously give their time for work which by its very regularity and continuity is so often taken for granted. The Society is sincerely appreciative of all this untiring service.

Sir Rudolph A. Peters, M.C., M.A., M.D., F.R.S.

Between the two wars international research led to the establishment early in 1931 of the International Council of Scientific Unions (I.C.S.U.), a reorganisation of the already existing International Research Council. The I.C.S.U. works through national committees organised by an Executive Board of which the reigning President is Sir Rudolph Peters, one of the most distinguished of our present members and the President of our Society for 1950-51.

The writer is sure that all B.N.S.S. members, and especially those who came to know Sir Rudolph during his Presidency, will wish to send their greetings and convey to him their thanks for the great service he is now rendering for the promotion of scientific knowledge in the spirit of international goodwill.

H.E.C.

Obituary

Harold Kemp Stanton

By the death of Mr. H. K. Stanton on the 24th July, 1961, our Society lost a valued member, whose willing and competent service in various ways and his innate modesty endeared him to his many friends in the Society.

He was born at Handsworth, Birmingham, on the 14th February, 1890, and was educated at the George Dixon Grammar School.

On leaving school his interest turned to engineering and his early training was with Butlers Ltd. and Powell & Hanmer Ltd. (both now absorbed by Joseph Lucas Ltd.)

Progress was delayed, however, by an illness when in his late teens, which necessitated an open air life, and his love of the countryside and all plant and animal life was awakened during several years farming in Warwickshire.

Having made a complete recovery he volunteered for army service during the First World War, but just as his train was about to leave New Street Station he was recalled to join the firm of Kynoch's Ltd.

He married in June, 1915, and in due course a son and daughter completed the family.

After that war he held works managerial posts with Radiation Ltd., Meccano Ltd. and William Hunt (The Brades) Ltd., until the advent of the Second World War, when he joined Birmingham Aluminium Castings (1903) Ltd. and here one of his achievements while Production Superintendent was to staff and organise full production of incendiary bombs, from a bare building shell and in a remarkably short time a million per month from this factory unit were assisting in the demolition of Hitler's Germany. A letter from the Minister of Defence applauded his feat.

The immediate post-war period was something of an anti-climax to Mr. Stanton and he became restless, and finally left industry in 1947 for semi-retirement in Bournemouth. Here he was able to spend happy hours in his garden and tend his bees and keep his car in good condition.

He joined our Society in 1949 and in the following year he was elected a member of the Council. It was his desire to become a useful member of the Society and any help he was asked to give was willingly and satisfactorily given.

Seven years ago the Society acquired a Cine Film Projector and Mr. Stanton undertook to take charge of the instrument and the projection. He trained a small team of assistants and the projection has gone smoothly from the start and has included 46 Subscription Programmes and many other films used to illustrate lectures. His last duty was to project films for entertainment at the Garden Party on the 22nd July, 1961, and he passed away suddenly on the following Monday. We shall remember him with gratitude for the help he gave us.

Reports of Sections for the year ending September 30th, 1961

Library

An exceptionally large number of books have been presented during the past year. The Society sincerely appreciates such generosity and gratefully thanks the following members or their relatives for the gifts: —

Mrs. K. L. Adams. Miss G. Bundy.

Miss E. G. Francis, sister of Miss E. Francis (deceased).

Messrs. H. E. Clarke, H. M. Lowe and W. J. Read.

Dr. D. A. Wray, Executor of Mr. F. Williamson (deceased).

Also the Poole Harbour Commissioners and several anonymous donors.

Of these books one hundred and fifteen have been placed on our shelves. The remainder will be placed in the Entrance Hall as soon as the alterations there are completed and will be offered to members, mostly free, but for a few items a small charge will be made.

The Society thanks Miss M. Penrose, Mr. W. J. Read and Mr. W. L. Whittle for continuing their gifts of periodicals during the year.

Five recently published books have been purchased, including "A History of Wimborne Minster and District" by G. A. Lindsay Clegg, Town Clerk of Bournemouth.

Mr. Foyle, my predecessor as Librarian, gave a short talk on the 12th October, 1960, about the books in the Library relating to Entomology; and on the 5th December, 1960, about those relating to Geology.

H. S. HOLBROOK.

Museum

The Museum Committee, consisting at present of the Chairmen of Sections, has had a very busy year. They met on seven occasions to discuss the re-arrangement of the exhibition cases and collections and assisted in removing cabinets and cases. Miss Mary Exton worked hard for two whole days in dusting and packing exhibits and we wish to thank her. Needless to say, dustpans, brushes and dusters were in active employment.

Mr. Chambers, Mr. Bickel and others assisted in getting the Main Hall cleared in readiness for the new Kitchen and new Main Hall.

There is a great deal of work to be done yet in sorting out duplicate material which is occupying valuable space.

Collections of Birds' Eggs, Cases of Birds, Small Geological Collections, etc., have been received and the donors were thanked.

The Committee regret the passing of Mrs. A. Brett, who for some years gave valuable help in cleaning the display cases and polishing the glass, a service of which we are very grateful.

Our thanks are due to Mr. W. P. Winter for his work as Secretary of the Museum Committee.

W. L. WHITTLE.

Garden

Since the date of last report the garden has taken shape in its new design. The dangerous copse of old Scot's Pines was felled and stumped and this area together with the *terra incognita* of brambles and overgrown shrubs on the south border was made into extended lawn and a mixed tree and herbaceous bed. Good gravel paths with stone edgings now give access to all parts and we have acquired a spacious garden shed. Some replanting on the east boundary and exchange of plants in other beds is now going on to complete the work. The west boundary bed still awaits a board fence to be erected by the new owners.

It is of interest to note that, although the Society parted with a 16-yard strip along the western side, the re-arrangement gives us nearly 100 square yards more lawn and twice the effective parking area.

The work has taken longer and been more difficult on account of the slender amount of voluntary assistance and the lack of professional help for many months. At the date of this report the latter trouble has been eased but help is badly needed from members to maintain our garden in its condition and beauty which, we are pleased to report, has been much admired by visiting lecturers and others including many who have enjoyed garden parties. With more help we can confidently hope to maintain grounds worthy of our Society. We are grateful for such help as we have received and for gifts which have been made. Plants of scientific interest and of beauty are always welcomed.

WINSOME CHOME.

Archaeology and History

The 1960/61 programme opened with a lecture by our old friend, Mr. S. E. Whitaker, P.A.S.I., on "Visits to Ancient Sites in Greece, Turkey and Asia Minor", both lecture and lecturer being warmly welcomed by the audience. In November, the Hon. Secretary of the Hampshire Field Club, Mr. R. L. P. Jowitt, talked to us on "An Architectural Tour of Yorkshire", introducing scenes which brought back memories to Yorkshire members of the Society and others familiar with the county of broad acres. In December, the Section chairman gave the second and concluding portion of his discourse on "Life in Ancient Egypt". The highlight of the Christmas season was the appearance, in full Tudor costume, of Brother Will Pulsford of St. Cross Hospital, Winchester, to give us an insight into that institution. January brought Mr. Whittle to the platform to give another well-illustrated talk

on the prehistoric world, especially animal life. In February, Mr. H. S. Altham, M.A., gave us a much appreciated lecture on Winchester Cathedral. He holds the positions of President of the Friends of Winchester Cathedral and of the Hampshire County Cricket Club and it is hoped to hear him again. Our own member, Mr. J. B. Calkin, spoke on "The Earliest Inhabitants of Britain" in March. In the same month, Dr. Margaret Wood, a well-known archaeologist, lectured on "Norman and Thirteenth Century Domestic Architecture", an aspect of mediæval building which receives less attention than the ecclesiastical one. The lecture season concluded in April, with an outstanding lecture by another well-known archaeologist, Mr. Ray Farrar, F.S.A., of the Royal Commission on Historical Monuments, his subject being "The Wattisfield Roman Pottery Experiment".

Archaeology figured in Miss Lowther's April excursion to Chichester, visits being paid to the Cathedral and the notable mediæval Hospital of St. Mary in the Sussex city.

In May, the excursion season opened for the Section with visits to Roman sites and remains in and around Dorchester, including the often overlooked Roman milestone at Dorchester and the temple at Preston, near Weymouth, both new to most members, and later in the month there was a comprehensive trip to Avebury, the West Kennet long barrow, Woodhenge and Stonehenge; a visit to the interior of the long barrow was a new experience to most of those taking part.

Owing to the absence of the chairman abroad, there was no excursion in June, but the programme was resumed in July with a visit to St. Cross, where Brother Pulsford met us again, and to the Pilgrims' Hall at Winchester, the latter being specially opened for us and Mr. Salway, the headmaster of the Pilgrims' School, kindly taking us around.

The August run was to Hambledon and Broad Halfpenny Down, with its cricket memories and souvenirs, and then to the Meon Valley, the Court House at East Meon being made available to us by its owner. Visits were also paid to Saxon churches in the valley and to Bishops' Waltham, the tea rendezvous.

The final excursion of the season, on September 14th, combined the itinerary of Sir Arthur Conan Doyle's "White Company" through the New Forest with a visit to Beaulieu Abbey, where, by permission of the sunny weather, the chairman gave an open air talk in the cloisters on monastic life and the Cistercians.

The excursions seem to have been greatly appreciated by the members who joined them and every effort will be made to maintain the standard.

September closed with the first lecture of the current season, by Mr. Whittle, on "Prehistoric Man in Europe", which covered a great range, illustrated by modern artists' somewhat imaginative impressions of prehistoric scenes.

Astronomy

On October 15th the Chairman lectured on the "Evolution of Stars", dealing with the types which, leaving the main sequence, conclude their careers as novae or supernovae respectively. On November 19th a film, "Radio-Astronomy in Australia", produced by the Commonwealth Scientific and Research Society, was exhibited, preceded by a short explanatory talk. On Monday, January 16th, Mr. Whittle discussed the subject of possible "Life on other Worlds" and on February 4th, Mr. W. H. Day spoke of astronomical statistics in general, under the title of "One, Two and Plenty". On March 18th the section welcomed Mr. F. G. Cunningham of the Southampton Astronomical Society, who spoke of spectroscopy as an astronomical technique, and on April 15th, Mr. J. F. Stray lectured on Einstein's General Theory of Relativity as applied to astronomy.

W. P. WINTER.

Botany

This section again reports a very active session, particularly in its many and varied field meetings, which have been well supported. During the winter season it was most fortunate in obtaining the services of several very distinguished lecturers. Professor Good, late of Hull University, has honoured the Society by becoming a member, and gave a most interesting talk, entitled "A Botanist in Australasia". A Kenya botanist, Mr. R. W. Rayner, now living in London, visited the Society and spoke on "Fungus Hunting in the Tropics"; and Professor Herklots, late Principal of the Imperial College of Tropical Agriculture in Trinidad, also came to lecture on "Tropical Climbing Plants". Our own Mr. Chambers gave one of his excellent talks on "Alpine Plants" and the chairman reviewed past field meetings with the aid of colour transparencies taken at the time, and took "Trees" as her subject at another meeting.

There have been 18 field meetings, which included several innovations, notably a visit to Hamstead, Isle of Wight, when the party was met by two members of the I.O.W. Natural History Society. This, and several other successful meetings were organised by Mr. and Mrs. Pickering, to whom we are greatly indebted for their good work! Another new venture was a coach party to Old Winchester Hill, which is situated in the Meon Valley and has been taken over by the Nature Conservancy, as being a stretch of country, threatened by agricultural development, which will now be preserved in its wild state. The Warden-Naturalist, Mr. D. B. Burton, met the party and conducted them over the site, explaining the work being carried out there as well as the policy of the Nature Conservancy.

A recent coach party was conducted to many parts of the New Forest by Brigadier F. E. W. Venning, to observe the different species of ferns, a subject in which he specialises.

Other meetings included visits by public transport to various parts of Dorset and Hampshire, as widely separated as Minstead and Fontmell Magna; and our grateful thanks are extended to all the leaders who have so kindly given time and energy to preparing and leading these walks.

We are greatly indebted to Mr. M. Cocke for his careful and painstaking work on the section's record book and to Mrs. Yule for taking charge of the botany room prior to its removal upstairs and for the following plant notes:

Alchemilla vestita at Parley.

Alopecurus bulbosus at Wareham (a Linton record confirmed).

Apium inundatum at Parley.

Lotus hispidus—has greatly increased lately.

Pernettya mucronata—naturalised on Hengistbury Head.

Lobelia urens—seen again in its old station.

Sisymbrium orientale has appeared in profusion on Southbourne Cliffs.

Some interesting aliens were found late last autumn on Southampton bomb sites, including *Verbascum phlomoides* and *Colutea arborescens*.

As a result of the long dry spell this summer, followed by recent rain, many spring plants are putting up a second crop of flowers!

A. K. HUNT.

Entomology

During the past year several Bournemouth residents have telephoned asking the writer to identify insects which have been found in their gardens. He is glad when it is possible to do this but it is sometimes difficult when one has to rely on a verbal description.

One of the creatures referred to turned out to be a Hornet, another was a Grasshopper, a third was a very small Lizard and a fourth was the larva of a Moth that always arches its back when walking and belong to the family of *Geometridae*. These caterpillars are sometimes called "loopers".

Evidence continues to grow that the chemical spraying of agricultural crops is leading to the extinction of numbers of insects and that as a result many flowering plants are under-pollinated.

It was noticed that last September more Crane Flies and Wasps were in evidence than is usual at this time of year.

On our Club Day in October last the writer spoke about the Insects to be seen in our Museum.

In January, Lady Hart Dyke gave a most interesting lecture on "Silk Farming in England".

On our last September Club Day the writer described and exhibited the various Butterflies to be found in Hampshire.

W. S. I. Cox.

Geography

During the winter months eight lectures were given under this section. Miss Y. Glover, Hydrographic Assistant to the Poole Harbour Commissioners, gave an interesting account of the work of maintaining the harbour, illustrated by her own attractive colour slides. Mr. G. Percival Kaye, who spent many years in the Far East, spoke of the Wild and Country Life of Western China, while Mr. F. J. Wood, who a few years ago made a trip across North America by coach, showed many striking pictures of the U.S.A. and Canada.

Mr. F. W. Robins, F.S.A., F.R.G.S., had visited Spain during the previous summer and described some of his experiences in a talk entitled "Romans, Moors and Spaniards" and, nearer home, Mr. G. Holroyd showed some of his colour slides of Ipswich, Suffolk and the Constable Country. "Our River" was the title of a film, with commentary and musical background, photographed and shown by Mr. J. B. Day and Mr. R. Harlock, depicting the course of the River Stour from its source at Stourhead in Wiltshire to Christchurch.

As a result of a field course organised in Scotland by Glasgow University, Mr. W. J. Evans, B.A., B.Sc., F.R.G.S., gave a talk on geographical studies in Strath Tay and Glen Lyon, while the Chairman described the geography of the country seen on a journey to Oberammergau and back, concluding with a short description of the 1960 Passion Play.

During the summer months there were five field meetings, of which the most ambitious lasted three days. On the first day the main geographical features of the Thames gorge at Goring, the river terraces higher up, the gentle dip slope of the Cotswolds and the typical village of Moreton-in-the-Marsh were studied. A visit to some of the Oxford Colleges and a performance of Hamlet at the Stratford Memorial Theatre added to the cultural enjoyment. On the second day, the very interesting pioneer industrial area of the Severn gorge, round Ironbridge, was visited on the way to the hills of the Welsh border where the tilted ancient resistant rocks give rise to a succession of scarped ridges such as Wenlock Edge and Longmynd. The night was spent at Malvern, where the pre-Cambrian rocks have been faulted and rise steeply directly from the New Red Sandstone rocks of the Severn plain, giving a wonderful panorama as far as the Cotswolds. Geographically, the highlight of the third day was the Severn bore, which surged up the river at Stonebench and made it obvious why navigation has to avoid the main river and proceed by the Sharpness Locks and the Berkeley Canal to Gloucester.

Some aspects of local industry were studied by visits to Max Factor's Cosmetic Factory, Poole Pottery and the Victoria Mills, where Mr. Yeatman explained the scientific methods employed by his firm in the production of animal feeding stuffs.

A walk to St. Catherine's Hill broke new ground by returning through the Hurn Court estate to Holdenhurst and then inspecting the new works at Iford for flood prevention on the lower Stour.

In May an excursion was made to the beautiful Stourhead Gardens, the route being up the Tarrant Valley and down the Winterbourne Valley in order to study the settlements in this typical chalk area.

F. M. EXTON.

Geology

During the past session, four lectures on widely varying aspects of geology were given, with particular emphasis on the economic aspects of our science.

In October, Mr. R. G. W. Brunstrom, M.A., F.G.S., who is in charge of the oil wells and investigations being carried out by the British Petroleum Company around Kimmeridge in Dorset, summarised the extensive researches that had eventually led to the extraction of natural oil at Kimmeridge and other localities in Great Britain. The lecturer illustrated his description by several remarkable diagrams showing the underground structure and varied rock-succession along the Dorset coast.

In February, one of our members, Mr. R. Agar, A.M.I.C.E., Deputy Engineer to the Bournemouth Corporation, gave us an interesting and lucid account of some researches he had been undertaking into the rate and nature of sea erosion taking place along the Yorkshire coast near Whitby. Mr. Agar has also been carrying out similar investigations in the Bournemouth district and an account of these proved of great interest to many of our members.

In March we were honoured by a visit from Professor H. L. Hawkins, D.Sc., F.R.S., F.G.S. Emeritus Professor of Geology in Reading University. Professor Hawkins is not only a well-known and distinguished geologist, but has also taken much active interest in the work of local scientific societies, being a former president of the South-Eastern Union of Scientific Societies, the Cotteswold Field Club and other local associations. On this occasion he gave us an interesting and graphic account of his recent visit to the Antilles in the West Indies, illustrated by a series of remarkable slides he had made from his photographs.

The final lecture of the session in April was given jointly by Mr. W. L. Whittle and Mr. W. Moore, who are well-known to our members for the valuable part they both take in the Society's activities. By means of a series of colour film strips they described in considerable detail the origin and working of coal; a subject on which they both spoke from their previous wide experiences in the coal industry.

The Geological Terrace on the East Cliff and the Russell-Cotes Art Gallery and Museum were visited in May under the guidance of Mr. N. Silvester, M.Sc., F.R.S.A., and Mr. H. Orr Paterson, B.A., A.M.A., Curator of the Art Gallery and Museum. The many types of rocks shown in the Geological Terrace were origin-

ally assembled and described by Mr. Silvester, and he gave an interesting account of them to a large assemblage of members.

Two coach outings were held in the summer. In July we visited Sturminster Newton, Shaftesbury, the Chalk Downs round the several Deverill villages, and the Vale of Wardour. At Tisbury, through the courtesy of Mr. J. C. Green, we examined the last of the quarries working the famous Chilmark Stone. In September, the remarkable coastal scenery around Durlston, Durdle Door and Lulworth Cove was examined under ideal conditions and provided many interesting features of great geological interest.

Our last excursion was on the afternoon of September 29th when Branksome Chine and Canford Cliffs were visited. Here we studied the origin and development of the local chines and other associated physiographical features.

The several outings attracted an average attendance of more than fifty members; and it is very gratifying to find they are so greatly appreciated.

D. A. WRAY.

Microscopy

This section is still available to the members requiring advice in the use of the microscopes and slides owned by the Society. A new Chairman is being invited to take over the direction of the Section in the coming year, 1961-62.

W. L. WHITTLE.

Photography

As usual an endeavour was made, through the medium of colour transparencies, to present the highest standards in photography. There was also an instructive lecture depicting the tricks of the trade in producing a film.

The season commenced with a welcome return visit of Mr. A. E. McR. Pearce, A.I.B.P., A.R.P.S., with "More Natural History Slides in Colour". A wide range of subjects was covered under this title, the slides being of particular interest to members of other Sections.

A new lecturer to the Society was Mr. J. P. J. Chapman, A.R.P.S., M.B.K.S., F.R.S.A., who took us behind the scenes in "Tricks of the Cinema in Film Production" and illustrated his subject by monochrome slides. We then went on a journey with Dr. T. M. Bell, B.A., M.B., B.Ch., M.R.C.S., L.R.C.P., to "Green Spain, Santander and Asturias", illustrated with his own colour transparencies. Mrs. E. M. Cooper, Mr. A. S. Aiers, Mr. G. E. Caswell, M.B.E., M.C., and Mr. W. J. Read, M.Sc., F.R.I.C., combined to show a varied collection of their colour slides taken throughout the year.

We then journeyed far and wide—first with E. M. Habershon on a “Coastal Trip to Lapland with a Bantam Kodak”. She emphasised the excellent results obtained with a simple camera in the hands of a beginner, and her kodachromes proved her point. Mr. Ernest Bristowe was our guide “In Europe with a Caravan” and illustrated his lecture by his own colour slides. A new lecturer to the Society, Miss Bridget Horsley, took us on a breath-taking trip “Across Canada by Car”. Her kodachrome transparencies and exhibits were much appreciated.

Returning to the British Isles “We take the Road to Skye” with the Dudleys and their friends—a combined effort by Mr. and Mrs. D. J. Dudley and Miss U. Ogle, who each gave their own version of the story, illustrated by their own colour slides and a few of Miss Gowlland’s. The commentary was done on a tape recorder with some musical illustrations. Finally we made “A Visit to West and South-West of Ireland” with Mr. G. Holroyd, who not only lectured but worked his own automatic projector, changing the slides by remote control.

All the lectures were well attended. The thanks of the Society are tendered to the lecturers for their time and trouble, and also to Mr. G. Holroyd and members of the Projection Panel, who showed the slides with their usual efficiency.

The Section would welcome any new suggestions or ideas for future programmes.

URSULA OGLE.

Physics and Chemistry

Exciting and rapid developments during recent months in ideas about the fundamental character and constitution of the atom have made it a matter of prime importance that passing reference should be made to them in these notes. Not only must we now contemplate the feasibility of a “fourth state” of matter, which has been styled “plasma” (arising out of research into exceptionally high temperatures where only nucleons and electrons can continue to survive) but we are also beginning to understand that the nucleons themselves (protons and neutrons) with their attendant mesons within the atomic nucleus, may prove to be themselves dynamic systems of considerable complexity. The realisation that electrons, while performing in the rôle of particles, can show great diversity of motion, spin and space coverage, has thrown new light on a number of outstanding theoretical problems, e.g., in magnetism and in what was called “action at a distance”, in days when the notion of a luminiferous “ether” was respectable. In molecular chemistry much new knowledge is being gained about interatomic bonds and about the strict dimensions and geometry of molecules large and small. A point of deep interest and significance is the finding that while refinements and accurate measurements are being applied to what were until recently largely hypothetical and theoretical concepts, they can be

so applied without damage to the massive superstructure, developed by the great workers of the 19th century out of the theory of atoms given to us by John Dalton over 150 years ago.

The year 1961 has seen much of the celebration of the foundation three hundred years ago of the Royal Society of London, and in honour of this anniversary the writer gave two lectures, one dealing with the age and practice of alchemy, and the other with the growth of systematic ideas in true chemistry. These were supplemented later by lectures on settled and transient features in Natural Science, and on the achievements of the New Chemistry now in process of rapid development. Two admirable films, kindly secured at the initiative of Mr. Bailey, provided the foundation for the writer's lectures on Magnetism and Radioisotopes in Industry. Experimental demonstrations of much interest have been furnished by Mr. Whittle, on "A Glass of Water" and the Southern Radio and Television Co., whose Mr. L. C. Greenham displayed and demonstrated modern equipment for marine use in radio telephony and on depth and direction finding.

Another successful visit by coach was made to Wilts United Dairy Co.'s Cheese Factory at Bailey Gate. This event loses nothing of its attraction by repetition—the factory has the largest output of Cheddar-type cheese in the U.K.

HERBERT E. CLARKE.

Zoology

The Organised Field Meetings, at approximately fortnightly intervals, have again proved interesting and enjoyable, and the weather has favoured us throughout. The previous year's disappointment and fears concerning Durlston Head's contribution soon faded when an attractive variety of sea birds, especially Puffins, were seen under very good conditions.

Scattered among birds seen more frequently were Woodlark (Stanpit, Oct. 18th), Black-necked Grebe (Poole Harb., Oct. 28th), Purple Sandpiper (Stanpit, Jan. 13th), Gadwall (Poole Park, Jan. 24th), Grey Plover (Poole Harb., Feb. 21st), Corn Bunting (Waterditch, Apr. 18th), Golden Plover (Avon Valley), Lesser White-throat (Linford, May 15th), Young Cuckoo fed by Pied Wagtails in a field (Kingston Lacy, June 27th), Kingfisher hovering and diving for food (Stanpit, twice), Green Sandpipers (Kingston, Aug. 21st), Party of 8 Ruffs (Stanpit, Sept. 8th) and a Little Stint (Stanpit, Sept. 21st).

The deplorable deposit of oil in Poole Harbour caused widespread casualties and many distressing sights on a shore notable for its ornithological interest. Permanent effects are unlikely, but those of the proposed car park may be.

Some reference should perhaps be made here to one result of the abnormally rainy winter (1960-61) with its overflowing rivers and flooded meadow land. In the Avon Valley really extensive areas lay under water, and on occasions resulted in unusually large

and interesting assemblies of wildfowl in which constant and irregular movement made accurate counting impossible. An effort was made on February 16th by the chairman and two keen members of the Group at one very large expanse south of Fordingbridge. Some impression of the wide and attractive prospect there outspread may be conveyed by giving the *minimum* figures for some of the constituent species. These included White-fronted (Geese) 180, Shoveler 70, Pintail 60, Teal 45, with (possibly) smaller numbers of Wigeon, Pochard, Tufted and Goldeneye scattered among them, and others too distant for certain identification. Meadowland under winter floods with its bare trees and seeming lack of life is usually impressive, but these acres offered a binocular banquet to those interested.

By the kindness of our member Miss Rowena Haines we enjoyed a most interesting account of the new Peakirk Wildfowl Reserve. On this subject she spoke from personal experience there, and her talk was well illustrated by her own films.

Club Day in April was devoted to a selection of British and Dutch recordings of bird voices, together with a few appropriate comments, and was enjoyed by members. This was a joint effort by the writer and Mrs. L. M. Maddox (a member of the Group) while Mr. Slater assisted with record player.

The Nightjar again used the writer's roof, and the unusually frequent sight and sound of Dartford Warblers in the pine and gorse garden hedge (daily in late August and September) suggested a better than average year for these, despite an extensive spring fire on the adjoining Common.

New members possessing binoculars are always welcome at the Field Meetings. The essential is real interest rather than previous knowledge as help is always available in the field.

H. V. HARRIS.

Cine Film Subscription Programmes

The interest of members in these programmes was well maintained and the last winter session was very successful. The attendance varied from 116 to 145, the average being 133. The Season Subscription was paid by 66 members.

Seven programmes were given during the season and 26 films were shown—24 in colour and 2 black and white—and the subjects were kept well within the range of the Society's activities. The films shown are intended primarily as visual aids to knowledge; entertainment value there may be also, but this is often found in nature itself.

During the year the sum of £6. 6s. 4d. was paid from our funds for the maintenance and improvement of the projection apparatus, making a total of £81. 4s. 0d. paid for this purpose during the seven years the programmes have been in operation.

Our thanks are due to the Cine Projection Panel led by Mr. H. K. Stanton for their efficient service, without which the films could not be shown. It is with deep regret that we have to report the sudden death of Mr. Stanton on the 24th July, 1961; an Obituary appears on another page.

We are grateful to the following members for suggesting films which may be suitable for our use:—Mrs. K. L. Adams, Mrs. C. M. Lanning, Mrs. W. Boyd Watt and Mr. W. P. Winter.

Suggestions of films suitable for our programmes will be welcomed if accompanied by particulars as to where they can be obtained on hire.

J. H. BAILEY.

Club Days

The Chairmen of Sections Committee arranges these monthly meetings and the attendances have been good.

At the October meeting Mr. Cox, Chairman of the Entomology Section, gave a talk on the Butterflies and Insects in the Society's collections, and Mr. Foyle, Librarian, exhibited books on the subject. In November Dr. Wray illustrated his talk on the Geological collections, and the Librarian, Mr. Foyle, had selected books dealing with the subject.

On the 14th December reports on the Annual Meeting of the British Association for the Advancement of Science held at Cardiff in August-September, 1960, were made by Mrs. W. Boyd Watt, Miss D. M. Lowther, Mrs. A. K. Hunt, Mr. W. Moore and the Rev. G. S. Reakes.

Other subjects discussed during the year were The Museum Exhibits; Natural History Observations; Holiday Colour Slides; Butterflies of the New Forest; Songs of Birds; The Importance of Field Meetings; and the Stratford-on-Avon and Malvern 3-day Coach Tour.

On June 14th Mr. E. Chambers conducted the members round the garden and described the various trees, shrubs and flowers.

Members are invited to suggest subjects for discussion at future meetings.

W. L. WHITTLE.

Presidential Address

The Contribution of Cambridge to Current Cosmological Controversy

by Mr. W. P. WINTER, B.Sc.

(Delivered before the Society on the 14 October, 1961)

When a Chairman of a Section of this Society is honoured by election as your President, his or her selection of a subject for an inaugural address is probably guided either by some dominating personal interest or by the view taken by the incoming President of what work done or published during the year then closing will make the date significant for that branch of knowledge with which his own section is concerned. Human judgments of the relative importance of contemporary events is notoriously faulty, but rightly or wrongly I submit to you that 1961 became famous in astronomical history when it was six weeks old on the day in February last when Professor Martin Ryle laid before the Royal Astronomical Society the results of the work accomplished in the Radio Observatory at Cambridge, which by a long series of observations on the number and distribution of the galaxies had doubled the linear dimensions of the then known Universe, multiplied its volume by eight and provided the material for certain far-reaching conclusions in cosmology.

To explain Ryle's recent work one must glance briefly at the state of our knowledge regarding the galaxies about 15 years ago. At this time it was generally accepted that the galaxies formed groups which, with the exception of our immediate neighbours, were receding at velocities approximately proportional to their distances from us. This knowledge had been obtained by spectroscopic observation of the images of the galaxies formed at the focal planes of a large telescope. The lines of various chemical elements then appeared shifted in position towards the red end, i.e., the wavelengths of the respective lines increasing as the pitch of an engine whistle falls as the train passes the listener.

Twenty years earlier Hubble had found a value for the constant by which the velocity of recession of galaxies must be multiplied to obtain their distances but Baade in 1952 showed that this must be greatly increased and his value has been raised since. Hubble drew the obvious conclusion that the whole universe must be expanding but Einstein showed that an observer on any distant galaxy would draw the same conclusion and all would imagine, mistakenly, that they themselves were the central point.

Such an expansion implied to Hubble that at a remote period in the past the material of what constitutes our existing Universe must have been compressed into a comparatively small volume and in 1929 L'abbé Le Maître of Louvain put forward that the universe had been created as a "primeval atom" of enormous density and perhaps only a few million miles in diameter. Under

gravitation alone this would be for a time stable, as for instance the companion of Sirius is stable and this is so dense that a ton of its material could go into a match box; but, of course, all time and space would be within Le Maître's primeval atom. At a certain time, calculated by the abbé as 2,000 million years ago the atom became unstable, a vast explosion occurred of which the author of the theory supposed that the cosmic rays are the eventual effects.

Eddington, who found Le Maître's original paper in an obscure Belgian journal, accepted the theory and attributed the expansion, or as it has been popularly termed, the "big bang" to a "constant of repulsion" whose effect was small at close distances but great at larger separations. In 1948, Gold and Bondi put forward as against the Le Maître-Eddington theory their view that as the galaxies move away from each other their places are taken by new ones formed as existing galaxies have been by the collection of cosmic dust and that this dust is being continuously created. For twelve years the exponents of these rival theories have argued their cases.

There is a crucial test between the two theories. On the Eddington-Le Maître evolutionary hypothesis the distant groups of galaxies should be more close to one another than those that are nearer, since groups at a distance of, say 7,000 million light years are not seen by us as they are but as they were 7,000 million years ago. On the primeval atom theory they were then very near together; hence a count of the number of groups in a given volume at varying distances should settle the matter. But the difficulty is that even the 200-inch Palomar which two years ago had a limit of 4,000 million light years and now one of 5,000 million does not reveal enough of the distant groups.

It was seen six years ago that only radio astronomy could, with existing techniques, answer the cosmological question. At a conference in 1955 Professor Ryle of Cambridge, announced that with a large radio-telescope which he had used he had found 2,000 "radio sources" popularly known as "radio stars" though now mainly identified as groups of galaxies since less than 200 were in our own galaxy like the strong source in Cassiopeia. A few years before Baade had found at Palomar the famous colliding galaxies in Cygnus, which were soon shown to be a very powerful emitter of radio waves, whose energy is computed to be 10^{30} kilowatts. The radio waves reaching the earth from celestial sources have lengths between a few centimetres and about seven metres, longer waves being reflected by the ionised layers of the earth's atmosphere, but between these limits radio waves pass through the dust of our own galaxy and the emitters can be observed by day and night. When an emitter recedes, the radio waves are lengthened just as for visible light. Certain wavelengths are known and used as the H and K lines of calcium in the spectroscope. Thus cool hydrogen emits a wave of length 21cm. and hot hydrogen one of 9cm. For emitters like A Cygnus the rates of recession can be measured optically or by tuning the receiving set to a maximum resonance.

For greater distances the Mullard radio telescope installed at Cambridge in 1958 uses a different method. At increasing distances from us we find that the number of galaxies which either optical or radio instruments can detect are emitters of the A Cygnus type, indicating that the galaxies are nearer together and collisions more frequent. The intensity of the signal is inversely proportional to the square of the distance of the emitter, with a correction for velocity which is easily applied. During the last few years Professor Ryle has measured distances of hundreds of galaxies of this type, many moving with speeds between 80% and 90% of that of light. He has examined the degree of closeness of those between 5,000 million and 8,000 million light years away and found that they are from three times to nine times the closeness of the radio emitters nearer to us. This is the region regarding which the controversy between the evolutionists and the continuous creation advocates is concerned and Professor Ryle claims that his results are decisive for the primeval creation and subsequent expansion theory. It may be added that the most rapidly receding of those recently listed by Ryle and his colleagues are at a distance of 10 billion light years from us, or twice the distance of the furthest detected by optical means. Meanwhile a group of physicists have evolved a theory that the cosmic constant can be explained if the electric charge of the proton exceeds that of the electron by an as yet quite undetectable amount.

The results of Ryle's work have a bearing on the cosmological theory put forward some twelve years ago by Dr. Gamov of Washington. Gamov saw the primeval condition as that of an enormous egg or atom consisting entirely of neutrons, quite unstable at the beginning, and expanding immediately since the radiation pressure at its high temperature 15,000 billion degrees C. greatly exceeded the gravitational pressure inwards. This theory assumed some nuclear chemistry which is considered more than doubtful but it took account of Einstein's theory that as the velocity of a particle approaches that of light so its mass approaches infinity and the curvature of space becomes more marked. But Einstein showed that the universe must be "open" or "closed" according as space is curved outwards or inwards. If the universe is "closed" then the distant galaxies will at a remote period move inward with the result that they will eventually rush together and reform the primeval egg. Thus cosmical history would begin again, the universe becoming pulsating or oscillatory.

The "galactic counts" made years back by Hubble were thought to have indicated a "closed" universe but the work of Ryle showing the marked increase in the number of galaxies at greater distances will, if taken by itself, suggest an open universe and no reassembling of its constituent parts. But a much more thorough study of the statistical evidence will be necessary before judgment on this matter can be pronounced.



