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JOURNAL OF THE TRANSACTIONS

OF

The Victoria Institute

VOL. LXXXVI

1954

JOURNAL OF

THE TRANSACTIONS

OF

The Victoria Institute

OR

Philosophical Society of Great Britain

VOL. LXXXVI

1954

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PAST PRESIDENTS

1865–1886.—The Right Hon. The Earl of Shaftesbury, K.G.
1886–1903.—Sir George Gabriel Stokes, Bart., D.C.L., F.R.S.
1903–1921.—The Right Hon. The Earl of Halsbury, P.C., F.R.S.
1921–1923.—The Very Rev. H. Wace, M.A., D.D., Dean of Canterbury.
1927–1941.—Sir Ambrose Fleming, M.A., D.Sc., F.R.S.
1941–1946.—Sir Charles Marston, F.S.A.
1946–1952.—Sir Frederic G. Kenyon, G.B.E., K.C.B., D.Litt., LL.D., F.B.A.

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The Rev. Principal H. S. Curr, M.A., B.D., B.Litt., Ph.D.
The Rt. Rev. H. R. Gough, O.B.E., T.D., M.A., H.C.F. (Bishop of Barking).
Professor Malcolm Guthrie, Ph.D., B.Sc., A.R.S.M.

Trustees.

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F. F. Stunt, LL.B.
E. J. G. Titterington, M.B.E., M.A.

The Council (Limited to twenty-four Members).
In order of original election.

Douglas Dewar, B.A., F.Z.S.
W. E. Leslie.
Robt. E. D. Clark, M.A., Ph.D.
Ernest White, M.B., B.S. (*Chairman of Council*).
Rev. C. T. Cook, D.D.
Rev. J. Stafford Wright, M.A.
E. J. G. Titterington, M.B.E., M.A.
R. J. C. Harris, A.R.C.S., B.Sc., Ph.D.
F. F. Stunt, LL.B.
W. E. Filmer, B.A.
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F. F. Bruce, M.A.
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E. W. Crabb, Dip.Litt., Dip.Th.
Gordon E. Barnes, M.A.
D. M. MacKay, B.Sc., Ph.D.
Rev. H. L. Ellison, B.A., B.D.

Honorary Officers.

F. F. Stunt, LL.B., *Treasurer.*
E. J. G. Titterington, M.B.E., M.A., *Secretary.*
F. F. Bruce, M.A., *Editor.*

Auditor.

G. Metcalfe Collier, A.C.I.I., *Incorporated Accountant.*

Assistant Secretary.

Mrs. L. I. Hargreaves.

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DISCUSSIONS

VICTORIA INSTITUTE

REPORT OF THE COUNCIL FOR THE YEAR 1953

READ AT THE

ANNUAL GENERAL MEETING, MAY 24TH, 1954

1. *Progress of the Institute*

In presenting to the Fellows, Members, and Associates the Eighty-seventh Annual Report together with a Balance Sheet and a Statement of Income and Expenditure, the Council returns thanks to God for the continuation of the work of the Institute.

The Council wishes to express its gratitude to all those who contributed papers during the session, to those who acted as Chairmen, and to all who contributed to the discussions.

Since the last Annual Meeting, Mrs. Owen, the assistant secretary, has been obliged to resign for personal reasons. The Council was well served by her. Her place has been taken by Mrs. Hargreaves, who is proving herself a very capable successor.

There has been a further slight reduction in the number of members. It has been suggested that some of the papers have been too technical, and not of sufficient interest to attract new members. It is proposed therefore to circularize a list of subjects and to ask members to indicate the subjects which they consider would be of most interest.

A public meeting was held at Bristol in connection with the Institute last October, when F. F. Bruce, Esq. and Dr. R. J. C. Harris gave addresses. Rev. J. Stafford Wright took a great deal of pains in organizing the meeting, which was well attended. The thanks of the Council are due to all those who took part in making the meeting a success.

The financial position has improved during the last few months. This has been brought about by two main causes. Firstly, owing to the generosity of Mr. W. E. Filmer, rooms for offices are now

available for the Institute at a nominal rent. Secondly, a new method has been devised of printing the papers and binding them in the Annual Transactions. This has led to a marked decrease in printing costs. These two items have produced a considerable saving in expenditure, but if the Institute is to attain a satisfactory financial position, this can only be brought about by an increase in membership, thereby increasing the income.

2. *Meetings*

Six Ordinary Meetings were held during the Session, in addition to the Annual General Meeting and Annual Address.

"Sanctity: Its Origin and Development," by REV. W. E. SANGSTER, M.A., Ph.D.

Rev. S. Clive Thexton, M.Th., in the Chair.

"From Matter to Mind," by DONALD M. MACKAY, Esq., B.Sc., Ph.D.

Professor C. A. Coulson, F.R.S., in the Chair.

"The Causes of Modern Unbelief," by REV. A. G. CURNOW.

Rev. C. T. Cook, D.D., in the Chair.

"Jesus and the Pharisees," by REV. H. L. ELLISON, B.A., B.D.

Rev. Jacób Jocz, Ph.D., in the Chair.

"The Bearing of Recent Psycho-Analytical Developments on the Psychology of Religion," by H. J. S. GUNTRIP, Esq., B.A., B.D.

Rev. Canon L. W. Grensted, M.A., D.D., in the Chair.

"Christianity and Modern Empiricism," by BASIL MITCHELL, Esq., M.A.

E. V. Rieu, Esq., C.B.E., Litt.D., F.G.S., in the Chair.

Annual Address—"The Objective Basis of the Christian Faith," by Professor MALCOLM GUTHRIE, Ph.D., B.Sc., A.R.S.M.

Ernest White, Esq., M.B., B.S., in the Chair.

3. *Council and Officers*

The following is a list of the Council and Officers for the year 1953:—

President

Vice-Presidents

The Rev. Principal H. S. Curr, M.A., B.D., B.Litt., Ph.D.

The Rt. Rev. H. R. Gough, O.B.E., T.D., M.A., H.C.F. (Bishop of Barking).

Professor Malcolm Guthrie, Ph.D., B.Sc., A.R.S.M.

Trustees

Ernest White, M.B., B.S.

F. F. Stunt, LL.B.

E. J. G. Titterington, M.B.E., M.A.

Council

(*In Order of Original Election*)

Douglas Dewar, B.A., F.Z.S.

Wilson E. Leslie.

Percy O. Ruoff.

Robert E. D. Clark, M.A., Ph.D.

Rev. C. T. Cook, D.D.

Ernest White, M.B., B.S. (Chairman of Council).

Rev. J. Stafford Wright, M.A.

E. J. G. Titterington, M.B.E., M.A.

R. J. C. Harris, A.R.C.S., B.Sc., Ph.D.

F. F. Stunt, LL.B.

W. E. Filmer, B.A., F.Z.S.

D. J. Wiseman, O.B.E., M.A., A.K.C.

F. F. Bruce, M.A.

A. H. Boulton, LL.B.

Honorary Officers

F. F. Stunt, LL.B., *Treasurer.*

F. F. Bruce, M.A., *Editor.*

E. J. G. Titterington, M.B.E., M.A., *Secretary*

Auditor

G. Metcalfe Collier, Esq., F.S.A.A., *Incorporated Accountant.*

Assistant Secretary

Mrs. W. R. Owen (till October).

Mrs. L. I. Hargreaves (from October).

4. *Election of Officers*

In accordance with the Rules the following Members of the Council retire by rotation: Rev. J. Stafford Wright, M.A., F. F. Bruce, Esq., M.A., Rev. C. T. Cook, D.D., and D. Deward, Esq., B.A., F.Z.S., who offer (and are nominated by the Council) for re-election.

G. Metcalfe Collier, Esq., A.C.A.A., Incorporated Accountant, of the firm of Metcalfe Collier, Hayward and Blake, offers (and is nominated by the Council) for re-election as Auditor for the ensuing year, at a fee of ten guineas.

5. *Obituary*

The Council regret to announce the following deaths:—

Professor A. Rendle Short, M.D., B.S., B.Sc., F.R.C.S. (*Vice-President*); W. Poynter Adams, A.K.C., M.I.E.E., F.R.S.A.; F. W. Davy, M.A.; W. Doman; Rev. Jacob Purnell; Rev. Stephen Taylor, B.A.; and John Widtsoe, Esq., A.M., Ph.D., LL.D.

6. *New Fellows, Members and Associates*

The following are the names of new Fellows, Members and Associates elected in 1953:—

FELLOWS: Rev. L. R. Aitken; Rev. J. Brittain; Edmond W. Crabb, Dip.Litt., Dip.Th.; Rev. J. F. Elliott, A.B., B.D.; Samuel S. Green, J.P.; Rev. K. H. Marr (on transfer from Associate); Oliver Douglas Smith, F.S.S., F.Econ.S.

MEMBERS: Rev. A. W. N. Campbell, A.S.T.C., Th.L. (on transfer from Associate); W. G. Clarke, B.Sc. (on transfer from Associate); James Graham, B.S.; C. W. Hamley; J. D. Harte, M.B., B.S., M.R.C.S., L.R.C.P.; (on transfer from Associate); Allan Mitchell, B.S., M.S.; Col. F. Molesworth (on transfer from Associate); Miss Helen Murrell, B.Sc.; Rev. J. H. Pickett (on transfer from Associate); K. D. Ramsbottom (on transfer from Associate); H. K. Airy Shaw (on transfer from Fellow); Charles G. Smith, M.I.Mech.E., M.I.E., F.I.D., M.S.A.E.; Rev. Lorne D. Stairs, A.B., B.D.; Allan Wilson, M.Sc., F.G.S., F.G.A.A.

ASSOCIATES: Peter Bagnall, M.A. (on transfer from Member); Francis Foulkes (on transfer from Member); Victor Perry; Rev. R. A. Webster, M.Sc., B.D. (on transfer from Fellow).

LIBRARY ASSOCIATES: South Eastern Bible College, Birmingham, Alabama; Tyndale Hall, Bristol.

7. *Membership*

Life Fellows	22
Annual Fellows	132
Life Members	32
Annual Members	223
Associates	40
Library Associates	60
Total Nominal Membership	509

This total represents a net decrease of 42 during the year. Sixteen new Fellows, Members and Associates were elected, and there were seven deaths and thirty-seven resignations.

8. *Donations*

W. E. Filmer, £35; Dr. B. P. Sutherland, £16 17s.; Lt.-Col. Leon Dale, £10; J. Fielding Smith, £8 15s. 7d.; Miss A. Naish, £5; Readers of *The Life of Faith*, £5; G. H. McKenzie, £2 10s.; A. J. S. Preece, £2 2s.; Rev. H. McKerlie, £1 17s.; Miss G. Martin-Harvey, £1 9s.; R. V. Klint, £1 8s. 5d.; H. D. Taylor, £1 7s. 1d.; Warren Young, £1 6s. 9d.; Rev. K. H. Marr, £1 6s. 6d.; Rev. Principal H. S. Curr, £1 1s.; J. B. Henderson, £1 1s.; G. A. Scott, 13s.; James McGavin, 17s.; Mr. Hopkins, 10s. 6d.; Rev. J. W. Wenham, 10s.; Rev. H. B. Centz, 7s.; Miscellaneous, 4s. 6d.; Total £99 3s. 4d.

BALANCE SHEET AS AT 31ST DECEMBER, 1953

1952	LIABILITIES	£ s. d.	£ s. d.
£	GENERAL FUND:—		
	Prepaid Subscriptions:		
49	Fellows	59 12 11	
62	Members	61 14 10	
4	Associates	19 17 3	
			141 5 0
175	Loan—W. E. Filmer, Esq.		140 0 0
12	Sundry Creditors: Expenses	1 0 0	
7	Audit fee	10 10 0	
630	Printing	199 9 7	
			210 19 7
594	Cash overdrawn, General Fund ..		590 16 5
			1,083 1 0
	SPECIAL FUNDS:—		
692	Life Compositions Fund..	666 6 6	
508	Gunning Trust	508 0 0	
200	Langhorne Orchard Trust	200 0 0	
220	Schofield Memorial Trust	220 0 0	
400	Craig Memorial Trust	400 0 0	
199	Prize Fund	201 7 4	
			2,195 13 10
£3,752			£3,278 14 10

1952	ASSETS	£ s. d.	£ s. d.
£	GENERAL FUND:—		
	Subscriptions in Arrear:		
43	Fellows	29 13 0	
52	Members	53 6 0	
2	Associates	4 2 5	
			87 1 5
22	Office Equipment		14 0 0
49	Sundry Debtors		84 7 6
	Deficit on General Fund:		
1,434	As at 1st January, 1953	1,365 3 10	
	Less Surplus, 1953	467 11 9	
69			897 12 1
			1,083 1 0
	SPECIAL FUNDS:—		
692	Life Compositions Fund, Cash	666 6 6	
508	Gunning Trust, £673, 3½% Conversion Stock at cost	508 0 0	
200	Langhorne Orchard Trust, £258 10s. 3½% Conversion Stock at cost ..	200 0 0	
220	Schofield Memorial Trust, £378 14s. 6d., 2½% Consols at cost	220 0 0	
400	Craig Memorial Trust, £376 7s. 4d. 3½% War Stock at cost	400 0 0	
199	Prize Fund, cash..	201 7 4	
			2,195 13 10
£3,752			£3,278 14 10

We have audited the accounts of which the foregoing is the Balance Sheet and have obtained all the information and explanations which we have required. Stocks of publications are held which do not appear in the Balance Sheet, subject to this, in our opinion the Balance Sheet shows a true and fair view of the affairs of the Victoria Institute, and is correct according to the books and records of the Institute, and the information and explanations given to us.

8th March, 1954.
199 Piccadilly, London, W. 1.

(Signed) METCALFE COLLIER,
Incorporated Accountant and Auditor.
METCALFE COLLIER, HAYWARD AND BLAKE.

PRIZE FUND

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To PRIZE AWARDED:—			By AMOUNTS IN HAND AT 1ST JAN., 1953:—		
Langhorne Orchard Trust		40 0 0	Gunning Trust	85 11 1	
„ BALANCES IN HAND: 31st Dec., 1953:—			Langhorne Orchard Trust	79 18 6	
Gunning Trust	109 2 0		Schofield Memorial	33 16 3	
Langhorne Orchard Trust	48 19 9				199 5 10
Schofield Memorial	43 5 7		„ INCOME:—		
		201 7 4	Gunning Trust	23 10 11	
			Langhorne Orchard Trust	9 1 3	
			Schofield Memorial	9 9 4	
					42 1 6
		£241 7 4			£241 7 4

CASH BALANCES

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To LIFE COMPOSITIONS FUND		666 6 6	By GENERAL FUND OVERDRAWN		590 16 5
„ PRIZE FUND		201 7 4	„ BALANCES AT BANK:—		
			General Account	51 6 9	
			Prize Account	218 7 11	
				269 14 8	
			Balances in hand	7 2 9	
					276 17 5
		£867 13 10			£867 13 10

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST DECEMBER, 1953

EXPENDITURE

1952									
£		£	s.	d.	£	s.	d.	£	s.	d.
	To PAPERS, LECTURES, ETC.:—									
	Printing:									
	General Printing 1953	33	18	4						
	Reserve for 1953 "Transactions"	363	3	9						
		397	2	1						
	Less: Reserved for 1952 "Transactions" £ s. d. 400 0 0									
	Cost of "Transactions" 322 18 6									
	Excess reserve w/o ..	77	1	6						
					320	0	7			
	Hire of Halls				16	5	0			
491								336	5	7
	„ ADMINISTRATION:—									
209	Salaries and National Insurance ..				239	2	2			
288	Rent and outgoings of office premises				72	19	2			
37	Postages				37	15	6			
122	Stationery and other office incidentals				126	9	10			
7	Audit fee				10	10	0			
—	Old Volumes				10	10	0			
								497	6	8
69	„ Excess of Income over Expenditure ..							467	11	9
£1,223								£1,301	4	0

INCOME

1952							
£		£	s.	d.	£	s.	d.
	BY ANNUAL SUBSCRIPTIONS:—						
404	Fellows	393	14	6			
480	Members	491	2	11			
14	Associates	22	1	4			
					906	18	9
	„ LIFE SUBSCRIPTIONS:—						
13	Proportion for 1953				25	9	6
102	Sales of publications				227	16	4
	„ DONATIONS:—						
130	Casual	64	3	4			
67	Covenanted (gross)	63	12	9			
					127	16	1
13	„ INTEREST FROM CRAIG MEMORIAL FUND				13	3	4
£1,223					£1,301	4	0

THE ANNUAL GENERAL MEETING OF THE VICTORIA INSTITUTE WAS HELD IN THE CAXTON HALL, WESTMINSTER, S.W. 1, AT 5.30 P.M. ON MONDAY, 24TH MAY, 1954.

Professor MALCOLM GUTHRIE, Ph.D., B.Sc., A.R.S.M., Vice-President, in the Chair.

The Minutes of the Annual Meeting held on 18th May, 1953, were read, confirmed and signed.

The Report of the Council and Statement of Accounts for 1953, having been circulated, were taken as read.

The Chairman then put to the Meeting the *FIRST RESOLUTION*, as follows:—

THAT THE REPORT AND STATEMENT OF ACCOUNTS FOR THE YEAR 1953, PRESENTED BY THE COUNCIL, BE RECEIVED AND ADOPTED.

There being no comments or amendments, the Resolution was carried unanimously.

The *SECOND RESOLUTION* was then proposed by C. E. A. Turner, Esq., M.Sc., Ph.D., and seconded by R. Macgregor, Esq., as follows:—

THAT THE VICE-PRESIDENTS, THE REV. PRINCIPAL H. S. CURR, M.A., B.D., B.LITT., PH.D.; THE RIGHT REV. H. R. GOUGH, O.B.E., T.D., M.A., H.C.F.; AND PROFESSOR MALCOLM GUTHRIE, PH.D., B.SC., A.R.S.M.; THE HONORARY SECRETARY, E. J. G. TITTERINGTON, ESQ., M.B.E., M.A.; AND THE HONORARY TREASURER, F. F. STUNT, ESQ., LL.B., BE, AND HEREBY ARE, RE-ELECTED TO THEIR OFFICES.

This Resolution also was carried unamimously.

The Chairman then moved the *THIRD RESOLUTION*, which was also carried unanimously, as follows:—

THAT F. F. BRUCE, ESQ., M.A.; THE REV. C. T. COOK, D.D.; DOUGLAS DEWAR, ESQ., B.A., F.Z.S.; AND THE REV. J. STAFFORD WRIGHT, M.A., RETIRING MEMBERS OF THE COUNCIL, BE, AND AND HEREBY ARE, RE-ELECTED.

ALSO THAT THE ELECTION OF E. W. CRABB, ESQ., DIP.LITT., DIP.TH.; AND GORDON E. BARNES, ESQ., M.A., CO-OPTED TO FILL VACANCIES IN THE COUNCIL, BE, AND HEREBY IS, CONFIRMED.

The Chairman then moved the *FOURTH RESOLUTION*, as follows:—

THAT G. METCALFE COLLIER, ESQ., INCORPORATED ACCOUNTANT, OF MESSRS. METCALFE COLLIER, HAYWARD AND BLAKE, BE, AND HEREBY IS, RE-ELECTED AUDITOR AT A FEE OF TEN GUINEAS, AND THAT HE BE THANKED FOR PAST SERVICES.

There were no comments or amendments, and this Resolution also was carried unanimously.

There being no other business, the Meeting was declared closed.

GENERAL INDEX TO THE TRANSACTIONS OF THE VICTORIA INSTITUTE

A GENERAL INDEX to the first forty-three volumes of the Journal of Transactions of the Institute (No. I., 1865, to No. XLIII., 1911), arranged alphabetically under both the names of the Authors and the Subjects, was issued with Volume XLIV. Part II of the Index comprising the twenty-seven Volumes XLIV (1902) to LXX (1938) can be obtained from the Secretary in separate form, bound in cloth, for one shilling.

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The Early History of the Victoria Institute. By E. J. G. TITTERINGTON, M.B.E., M.A.
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The Institute and Biblical Criticism To-day. By Sir FREDERIC G. KENYON, G.B.E., K.C.B., D.Litt., LL.D., F.B.A.

VOL. LXXXIII. (1951.)

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The Supposed Evidence for Re-Incarnation. By Rev. J. STAFFORD WRIGHT, M.A.
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Prophecy and Psychical Research. By R. E. D. CLARK, M.A., Ph.D.
The Composition of St. Matthew's Gospel. By B. F. C. ATKINSON, M.A., Ph.D.
The New Materialism. By ERNEST WHITE, M.B., B.S.

VOL. LXXXIV. (1952.)

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Modern New Testament Scholarship and Psychology in Regard to the Miracles of Healing. By Rev. JOHN CROWLESMITH.
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The Aims and Scope of the Philosophy of Religion. By the Very Rev. W. R. MATTHEWS, K.C.V.O., D.D., D.Litt., Dean of St. Paul's.
The Limitations of Natural Theology. By R. T. LOVELOCK, A.M.I.E.E.
The Dead Sea Scrolls: Towards a Perspective. By Rev. BLEDDYN J. ROBERTS, M.A., B.D.
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Sanctity: Its Origin and Development. By the Rev. W. E. SANGSTER, M.A., Ph.D.
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Jesus and the Pharisees. By the Rev. H. L. ELLISON, B.A., B.D.
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Church Army Press and Supplies Limited, Cowley, Oxford, England 8679

ERRATA

Page 64, line 5, "of those" *should read* "to those."

Page 65, last paragraph, line 14, "excavations" *should read* "explorations."

Page 66, last paragraph, line 7, "town" *should read* "sown."

Page 70, line 2, "presupposition" *should read* "presuppositions."

918TH ORDINARY GENERAL MEETING

OF THE

VICTORIA INSTITUTE

AT

THE CAXTON HALL
WESTMINSTER, S.W. 1

ON

MONDAY, 19th OCTOBER, 1953

N. N. E. Bray, O.B.E., in the Chair

RECENT THEORIES OF THE ORIGIN OF MAN

By DOUGLAS DEWAR, B.A., F.Z.S.

THE VICTORIA INSTITUTE
22 DINGWALL ROAD, CROYDON, SURREY

RECENT THEORIES OF THE ORIGIN OF MAN

By Douglas Dewar, B.A., F.Z.S.

SYNOPSIS

The following theories are considered:—(1) Severtzoff's theory of "Aromorphosis", applied to man by F. E. Zeuner and F. Wood Jones; (2) G. G. Simpson's theory of "Quantum Evolution"; (3) A. Vandel's theory of "Progressive Evolution"; (4) G. Salet and L. Lafont's theory of "Regressive Evolution"; (5) F. Weidenreich's theory; (6) Ruggles Gates' theory; (7) H. V. Vallois' theory; (8) R. N. George's theory; (9) The theory of R. Dart, R. Broom and J. T. Robinson; (10) Sir A. Keith's "Group" theory; (11) H. Schepers' theory; (12) The theory of W. A. Straus, jr.

CONCLUSION. So far Science has thrown no light on the origin of man.

In the past ten years a dozen new theories of the origin of man have been formulated. Four of these are attempts to account for the lack of fossils intermediate between man and a four-legged ancestor, viz. the theories of aromorphosis, quantum evolution, progressive evolution and regressive evolution.

1. The Aromorphosis Theory

This theory, formulated by Severtzoff in *Morphologische Gesetzmässigkeiten der Evolution* (1931), is that there are two kinds of evolutionary changes, those which increase the energy or life activity of an animal and those which do not. The former are the ones that cause evolution. This kind of change Severtzoff calls aromorphosis and the result an aromorph. As an example he cites the supposed conversion of one of the gill arches of a primitive fish into the biting apparatus of most living fishes. As fishes possessing jaws are far less restricted than jawless fish such as lampreys and hagfishes in the selection of food, they are better nourished and their general energy of life is greater.

Although there is no experimental or other direct evidence that aromorphosis has ever occurred, the idea was welcomed by some evolutionists and has been applied to man. Thus F. Wood Jones writes: "Man's ancestors attained to uprightness by an aromorphosis that was completed as a functional entity" (*Hallmarks of Mankind*, 1948, p. 74). F. Zeuner writes: "The evolution of man may also be regarded as characterized by an aromorph, viz., erect posture" (*Dating the Past*, 1944, p. 381).

2. The Theory of Quantum Evolution

G. G. Simpson asserts (*Tempo and Mode in Evolution*, 1944, p. 207) that in addition to changes ordinarily undergone by animals, there are big ones involving the acquisition of a more or less radically distinct way of life resulting in what he calls Quantum Evolution. "Profound transformations", he writes (*Horses*, 1951, p. 208), "are relatively uncommon in evolution, but have great importance when they do occur. The change of a fish fin into a foot, and much later, the change of a reptile foot into a bird's wing, were transformations of the most far-reaching significance, so still later were the various transformations involved in our own history. Such a change arose when our four-footed ancestors reared up and became two-footed."

Simpson states his theory at great length in *The Meaning of Evolution* (1950). It is that there are four levels of Primate brain development: (1) Prosimians, (2) South American monkeys, (3) Old World monkeys, (4) Apes, Hominids and men. These do not represent four successive steps. The prosimians apparently gave rise separately to each of the other groups: "The four (main) types of apes and men are independent surviving lines, all deriving separately from the Miocene radiation" (p. 90). Simpson's quantum evolution is clearly special creation dressed up to look like evolution. Apparently in order to prevent readers seeing through the disguise, Simpson makes such statements as "There is no real evidence that evolution has a goal, and there is overwhelming evidence that it has not" (p. 304). "Man has risen, not fallen" (p. 310). "Man is the result of a purposeless and materialistic process that did not have him in mind" (p. 344).

3. The Theory of Progressive Evolution

This theory is expounded by A. Vandel, Professor of Zoology at Toulouse, in his *L'Homme et l'Évolution* (1949). It is that evolution is a cyclic phenomenon. Each cycle is made up of a creative period in which progressive evolution takes place and many species jump to a higher level of organization where they blossom into new species, varieties and families. This is followed by a period of regressive evolution, of stagnation, inertia and extinction. Then a new cycle begins in which the extinct types are replaced by new ones. He asserts (in italics): "*the principle of replacement is one of the most characteristic and fundamental aspects of evolution.*"

Vandel makes no attempt to draw up a pedigree of man, but he insists on what he calls the stratified structure of human organization. He writes (p. 156): "The body of man appears under the aspect of a complex mosaic of characters of different origin and age. It is to-day possible to establish with sufficient approximation the phyletic origin of his principal organs and to fix their dates. His hollow spinal cord goes back at least as far as the Cambrian. His pentadactyl limbs took form at the end of the

Devonian. His jaw dates from the Lower Devonian. His teeth acquired their histological structure at the same period; their differentiation into incisors, canines and molars dates from the Trias; the quadritubercularity of his molars goes back to the Jurassic. Finally his erect posture, projecting nose, prominent chin, high forehead, complex brain . . . date only from the quaternary." He adds: " when comparative psychology shall have emerged from its present infantile state, it will be possible to discover in the psychic structure of man an analogous stratification and to recognize the successive strata that constitute its substance." He asserts (p. 189): " Animality ceased to evolve from the instant at which it engendered the human stratum. . . . To-day man is the only being capable of progressive evolution. . . . But it would be a grave delusion to expect indefinite progress in man. The level of his intelligence and psychic faculties is determined by nervous organization. Geniuses, saints and heroes probably represent the highest summits mankind will ever reach." But evolution will resume its march one day in the future and " will seize on a being who will replace man as he himself has replaced the animal. Man is not a terminal, but a term of passage. . . . Even as Galileo proved that the earth is not the centre of the universe, so has the evolutionist revealed that humanity by no means represents its term."

Vandel frankly admits that his ideas are likely to shock " excellent minds " and do not accord with traditional scientific thought.

4. The Theory of Regressive Evolution

Vandel's theory, like the theories of Aromorphosis and of Quantum Evolution, is a theory of special creation, couched in terms of evolutionism. We have now to notice a theory enunciated by two creationists, Georges Salet and Louis Lafont, in their book *L'Évolution Regressive*, published in Paris in 1943.

According to this theory geological time should be divided into three sharply defined periods: (1) The period of creation and the formation of the world before the creation of man; (2) The period of the Golden Age in which man was created; and lastly (3) The period of Regressive Evolution which was initiated by the fall of man, as recorded in Genesis. In the first two of these periods no fossils were laid down because in them there was no death either among animals or mankind. In the third period, inaugurated by the sin of man, life became hard and death entered the world, many of the animals took to a carnivorous diet, developed weapons of offence and defence, and living organisms suffered increasing deterioration, and many kinds of organisms became extinct because they could not endure the rigours of their surroundings, as is shown by the great crops of fossils in various geological deposits. Man, like animals and plants, deteriorated, some men in consequence sank almost to the level of animals.

"It is not the animal that has become progressively human," write Salet and Dupoint (p. 66); "it is man who has deteriorated towards animality . . . in our conception, far from being the fruit of evolution, man is the cause of it."

Their book is full of shrewd criticism of the transformist theory.

In support of their contention that man has degenerated since his creation, they stress the fact, burked by most evolutionists, that some of the earliest known fossils of men are of modern type. They cite as examples the Foxhall jaw, Castenedolo and Olmo skulls, the Bury St. Edmunds fragment, Galley Hill and Swanscombe man. They also assert that there is the possibility that Ameghino may have been right in claiming that Diprothomo and Tetraprothomo lived in the Miocene and Pliocene periods. They also mention some finds recorded by Brion in *La Resurrection des Villes Mortes* (1938): viz. a fossil human tooth in an Eocene deposit, a human footprint in a Triassic rock and the drawings of Diplodocus and a Dinosaur of the Upper Jurassic period. According to Brion these discoveries are mentioned in *Discoveries relating to Prehistoric Man*, published in 1927 at San Francisco. They admit that further evidence is needed before these finds are accepted as authentic.

While not subscribing to this theory, we must admit that evidence of the great antiquity of man is accumulating. Two recent finds are the discovery in 1947 of the greater part of a skull by Mlle. Henri-Martin in a deposit laid down in the third interglacial period at Fontéchevade, France, and the discovery by Coon and Duprée in 1951 in a cave at Hotu by the Caspian Sea, of three human skeletons, which they deem to be 70,000 years old. An illustrated account of this find is in *Life* of May 21st, 1951.

5. Weidenreich's Theory

Franz Weidenreich states his theory in *Apes, Giants and Man* (1946). It is that the earliest men were giants and that there has been a continuous line of gigantic and nearly gigantic human forms characterized by a gradual reduction in size, this reduction going hand in hand with a progressive trend in other features. He does not suggest which Primate gave birth to man, but he asserts (p. 19): "The evolution of the Primate branch which we call 'man' must have begun much earlier than we ever dreamed." He also writes (p. 83): "It seems that there must have been, not one, but several centres where man has developed. But we should be completely at a loss if someone should ask on which special spot of the earth the decisive step was made that led from the simian creature to man. There was not just *one* evolutionary step. Evolution went on wherever man may have lived, and each place may have been a centre of both general development and special racial strains."

He drew up the following pedigree: Gigantopithecus—Meganthropus—Pithecanthropus robustus—Pithecanthropus erectus—Pithecanthropus (Homo) soloensis—Wadjak man—Australian bushman.

Of the above, all that is known of Gigantopithecus is three isolated molar teeth procured by Von Koenigswald over a period of six years in drug stores at Canton and Hongkong. These teeth are enormous, seven or eight times the size of modern human molars. Their possessor must have been twice the size of a gorilla. Von Koenigswald and most authorities consider that these are ape's teeth. Weidenreich deems them human and says they should be named Giganthropus. All that is known of the second of Weidenreich's line of ancestors, Meganthropus, is part of a jaw with two premolars and one molar tooth, found by Von Koenigswald at Sangiram in Java. These teeth, while not so large as those of Gigantopithecus, are twice the size of present day corresponding teeth.

Weidenreich derives the African races from Rhodesian man, white men from Skhul man in Palestine through Tabrun man and Cro-magnon man. He derived the Mongols from Sinanthropus, through the men whose fossils occur in the upper cave at Choukoutien. He asserts (p. 27) that " there is not the slightest doubt that Sinanthropus was a true man, although a very primitive type—in any case, more primitive than any of the long-known Neanderthalians ".

6. Ruggles Gates' Theory

R. Ruggles Gates expounds his theory in *Human Ancestry from a Genetical Point of View* (1948). It is that mankind has a multiple origin, and that the main human races are of five different species, each derived from a different ancestor, These are:

(1) Homo australicus (Australian aborigines), descended from Pithecanthropus through Palaeoanthropus (Javanthropus) soloensis, Homo Wadjakensis and Talgai man.

(2) Homo capensis (South African Bushmen), derived from Africanthropus njarensis through Rhodesian man, Florisbad man and Boskop man.

(3) Homo africanus (Negroes), also derived from Africanthropus njarensis, the present differences being the result of specialization and adaptation to tropical conditions of the Negro, the close connecting link being the similarity of the peppercorn hairs of bushmen and the kinky hair of the Negroes.

(4) Homo mongoloideus (Mongols and American Indians), derived from Sinanthropus.

(5) Homo caucasus (White men). As to their origin Gates writes: " in Europe the Pithecanthropus level has never been found, but the evident relation of Boskop man to the European Cro-magnons make Boskop man appear as ancestral to them, but unrelated to Neanderthal. . . . The dark

skin and peppercorn hair were probably shed in northern Africa before this species of Homo entered Europe " (p. 217).

As to the origin of Pithecanthropus, Gates thinks it might have been derived from one of the South African " Man-apes ". " But it is still possible that these man-apes terminated in a dead-end. If so Pithecanthropus may have arisen from some Asiatic derivative of the Dryopithecinae having more or less similar characters."

Gates also believes that there have been two main lines of human evolution, one of which (the gorilloid line) has great brow ridges, which the other line (the orangoid) lacks.

That all his species of men interbreed freely does not deter Gates from making separate species of them. He sets no store by the fertility test.

Nevertheless his book is valuable on account of its thirty pages of bibliography.

7. Vallois' Theory

Henri V. Vallois, like Ruggles Gates, believes in the polyphyletic origin of man, but does not assign any definite pre-human ancestor to any human race. He outlined his theory of the origin of man in a paper read in 1950 before an international gathering of zoologists at Paris and published in the volume *Paléontologie et Transformisme* (1950).

Vallois holds that man's nearest living relatives are the chimpanzee, gorilla and orang, and that from the beginning the hominidae were diversified, and at each stage of development they expanded in a series of branches. Many extinct types probably existed which perhaps future discoveries will reveal. He maintains that at no age has a fossil been found which is nearer to man than any of its contemporaries. Not one of them is more primitive or more evolved *en bloc* than the others, but each exhibits more primitive and more evolved features. For example, Pithecanthropus and Sinanthropus, which Vallois calls prehominids and which were contemporaries, are, in Vallois' opinion, equally far removed from modern man anatomically; Pithecanthropus is the more primitive in respect of brain capacity, great length of cranium and (in P. robustus) having a pre-canine diastema in the upper jaw. Sinanthropus is the more primitive in the supra-orbital torus, femur, and teeth. For these reasons Vallois asserts that the known fossils show that the general conception of a " missing link " between apes and man (if the unknown stage which preceded the hominids can be so called) is based on *a priori* ideas not supported by palaeontological documents.

8. T. Neville George's Theory

The first-known fossil of the Miocene ape Proconsul was found in Kenya in 1933 by Hopwood and is constituted of parts of the upper jaw and palate with some teeth and part of the upper jaw with teeth. Hopwood

deemed it ancestral to the chimpanzee. In 1942 MacInnes found in the Victoria Nyanza district a lower jaw and two ankle bones. He thinks that these show the ape to be near the line of human ancestry. In 1946 Leakey found in Rusinga Island another lower jaw, and in 1948 Mrs. Leakey found an almost complete skull. As this was the first fossil skull of a Miocene ape to be found, Mrs. Leakey flew her treasure to England! After its arrival in England Le Gros Clark examined the skull and stated in a broadcast (*Listener*, February 24th, 1949) that in some respects the skull resembles that of a monkey more than that of a living ape, but it shows some resemblances to man not found in living apes. For these reasons he regards Proconsul as " of a primitive and generalized type which by progressive modification along divergent lines of evolution might conceivably have provided the basis for a common ancestry of both man and the modern apes."

In contrast to this guarded statement, T. Neville George, Professor of Geology, University of Glasgow writes: " Man is a member of a comparatively insignificant and primitive group of animals, the Primates. . . . Anatomically man is a great ape, not differing in any notable features from the other apes. . . . Man shows evolutionary progress notably in two features, the structure of the head and his upright posture. . . . In these features he is progressive and offers the main contrast to the ' conservative ' gorilla and chimpanzee. A number of intermediate types linking man with typical apes are now fairly well known. He belongs to a divergent offshoot that stemmed from a form not unlike the mid-tertiary Proconsul, a ground dweller, standing, perhaps not too surely, on his hind legs " (*Evolution in Outline*, 1951, p. 112). George makes the following pronouncement on p. 116: " Monkeys and men happen at the moment to be successful or perhaps in the ascendant. . . . The rise and the diversification of the various groups took place by a happy but quite fortuitous association of the right genes and the appropriate environment."

9. The Theory that Man evolved from a South African Ape-Man

This theory is the outcome of the discovery in South Africa since 1924 of numerous fossils of a group of extinct apes, named the Australopithecinae. Some South African zoologists, notably Professor Raymond Dart, the late Dr. Robert Broom and Mr. J. T. Robinson call these creatures " ape-men ", and, being convinced that man evolved from one of this group, they have exercised their imagination and have sent to the press all over the world verbal and pictorial descriptions of what they imagine these creatures looked like when alive, together with descriptions of what they imagine the habits of these creatures were. As these apes have had even greater publicity than that given sixty years ago to the Java ape-man, Pithecanthropus, it seems desirable to set forth the data on which these descriptions are based, seeing that nothing approaching a

complete skeleton of any of them has been found. Apart from skull, jaws and teeth, very little is known of the skeleton; of the long bones only one complete thigh bone assigned to Plesianthropus has been found and this measures in length 12 inches as opposed to the 20 inches of an average human thigh bone. Three more-or-less complete pelvises have been found of these apes.

The fossil bones of these creatures that have been described are assigned to one or other of the following six species:

(1) Australopithecus africanus, found at Taungs, about 120 miles north of Kimberley.

(2) Australopithecus prometheus, found at Makapan, a few miles north of Pretoria.

(3) Plesianthropus transvaalensis. Most of the bones ascribed to this creature were found at Sterkfontein, about 25 miles from Johannesburg, and some at Bolt farm about a mile from Sterkfontein.

(4) Paranthropus robustus, found at Kromdraai, two miles from Sterkfontein.

(5) Paranthropus crassidens, found at Swartkranz, one mile from Sterkfontein.

(6) Telanthropus capensis, also found at Swartkranz.

The fossils of all the above species were found in unusual circumstances, in localities where the limestone of the hillsides is honeycombed with fissures, caves and holes made by underground streams, and for more than fifty years there has been extensive quarrying for limestone, and the removal of the lime has left exposed numbers of blocks of hard useless breccia in which bones, broken or unbroken, of many kinds of animals, living and extinct, are firmly embedded. Much of this has been piled in dumps near where the blocks of lime have been excavated. Thus a search at any of these dumps is likely to lead to the discovery of fossils. Dr. Camp mentions the boulder some four feet in diameter in which the only complete femur was found. In this block were seen the end of another femur, a rib, a skull with complete teeth and numerous fragments. Of course most of the bones embedded in this hard breccia are not those of Primates. All mixed together, whole or broken, are bones of antelopes, horses, hyenas, rodents and many other creatures. These seem to have been carried to the spot where they were found by predacious animals or swept there by torrents.

Most of the fossils of these Australopithecinae were found by those who are not biologists.

The fossil skull and jaw named Australopithecus africanus was blasted out of a limestone quarry at Taungs in Bechuanaland in 1924 by a quarryman, Mr. de Bruyn, who sent it to Professor Raymond Dart, who cleaned it, and reported the discovery in *Nature* in February, 1925. In his report he wrote: " unlike Pithecanthropus, it does not resemble an ape-like

man, a caricature of precocious prehominid failure, but a creature well-advanced beyond modern anthropoids in just those characters, facial and cerebral, which are to be anticipated in a link between man and his simian ancestor." The experts in England and America did not agree; they deemed the creature to be a young individual of a kind of chimpanzee. Dr. Robert Broom, however, sided with Dart, his fellow South African. He wrote: " The discovery of Australopithecus may have nearly as great an influence as the publication of Darwin's *Origin of Species* " (*Natural History*, 1925) and in his *The Coming of Man* (1933) he wrote (p. 79): " We can quite confidently say that all varieties of man and protoman have been evolved from one anthropoid ape which was nearly allied to if not of the same genus as Australopithecus africanus."

The fossil bones which Dart has named Australopithecus prometheus were picked up off a dump in 1947 and 1948 at the limeworks at Makapan, a few miles north of Pretoria. They consist of the back part of a skull of an adult and a broken jaw of a young ape of which the front teeth has been knocked out. As on this dump had been found broken bones and crushed skulls of numerous animals, including small extinct baboons, Dart concluded that A. prometheus preyed on these and killed them with some kind of weapon, and he contributed to *South African Science* (Feb. 1949) an article entitled " The Bone Bludgeon Hunting Technique of Australopithecus ", in which he wrote: " The matter of major importance is now not, ' Did Australopithecus wield weapons? ' but ' What weapons did he wield? ' Were they principally of bone or stone or wood? Did he fashion weapons or accept them as they came into his hands? "

He even went so far as to assume that this creature used fire because some carbon particles occur in the breccia at Makapan. Although the skull of this creature is not nearly complete, Dart believed it to be that of a female and estimates the brain capacity to be 650 cc. In justice to Broom it should be said that the notion that this ape knew the use of fire was more than he could swallow. In this connection it is well to bear in mind that in none of the places where the fossils of these apes have been found has anything like a human artefact been seen.

In consequence of Broom's conviction that Australopithecus was an ancestor of men, Smuts secured for him the post of Curator of the Transvaal Museum at Pretoria to enable him to look for the " missing link ".

At the suggestion of two of Professor Dart's students who had found fossils in the Sterkfontein caves near Krugersdorp, Broom asked Mr. G. W. Barlow, the curator of the caves and the manager of the quarrying operations there, to keep a lookout for anything like an ape's skull. Within a week Barlow blasted out about two-thirds of a skull which Broom named Plesianthropus transvaalensis, deeming it an " ape man ". Search in this cave yielded nothing of importance during the next two years. In

1938 the discovery of a skull at Kromdraai diverted Broom's attention and during the war the search for fossils stopped. In 1947 Broom resumed the search at Sterkfontein and on April 18, 1948, he blasted from this cave what he describes as " a perfect skull of an adult female . . . the finest fossil skull ever discovered . . . the skull of a being not yet man but nearly man . . . the skull is practically human in all respects, except that the brain is small—only 480 cc." (" The Ape-Men," *Scientific American*, November, 1949, p. 24.) In his many popular articles Broom refers to this skull as " Mrs. Ples ", and to the male skull as " Uncle Ples ". Unfortunately Broom, when blasting the skull out of the breccia, broke it, the top being left in one piece of the rock and the rest of the skull in another. Perturbed by this rough and ready method of extricating fossils, the South African Historical Monuments Commission ordered Broom to cease operations until the arrival of an expedition being sent by the University of California to explore for fossils.

Despite this, Broom continued his search and found, to use his own words, " an almost perfect male jaw, the most notable feature of which is that though the canine tooth is larger than in man, it has been ground down in line with the other teeth exactly as in man. This never happens in the males of the anthropoid apes. Then we made an even more important find—a nearly perfect pelvis. This structure, human in all essentials, proves that the ape-men walked on their hind legs."

At this juncture the American expedition arrived and it was agreed that Broom should transfer his attention to the cave at Swartkranz near by, while the Americans should explore the Bolt Farm quarry a little over a mile from Sterkfontein. Here Drs. Camp and Peabody extracted two thigh bones, one of them being the only complete long bone of these apes yet discovered. They say that these bones are in size and shape comparable to those of the chimpanzee, but their thickness and the large muscle impressions are human rather than anthropoid features, and the head of the bone shows that it comes from an erect walking creature. They think these thigh bones belong to Plesianthropus. Other bones seen by them had not been extracted from the breccia and so they refuse to make any pronouncement regarding them.

The skull named Paranthropus robustus by Broom was found in June, 1938 by a schoolboy named Gert Terblanche, who saw it embedded in an outcrop of bone breccia on the hillside at Kromdraai, two miles from Sterkfontein. The boy with a hammer hacked out the skull in pieces. He put four loose teeth in his pocket, took the palate, which still held a molar tooth, to Barlow and sold it to him. Barlow resold it to Broom for £2 and told Broom how he came by it. Broom at once interviewed the boy and, writes: " the boy drew from his trouser pocket four of the most beautiful fossil teeth ever found in the world's history. Two of the four fitted on the palate Barlow had given me. The other two had been

weathered off. I promptly bought the teeth from Gert and put them in my pocket. Gert told me he had another nice piece hidden away. . . . Then Gert took me up the hill and drew out from his hiding place a very fine jaw with some beautiful teeth. In the next few days we sifted all the ground in the close neighbourhood and recovered nearly every scrap of tooth or bone in the place. When all the bits were cleaned and joined, it was found that we had the greater part of the left side and of the right lower jaw of a very fine skull, with many of the teeth well preserved. The skull differed in a number of characters from that found at Sterkfontein, and it had a larger brain. In some respects it was more human; in a few less human. We described it as a new genus named Paranthropus robustus " (*Scientific American*, November, 1949, p. 22).

In 1942 the lower end of the upper arm bone and the upper end of the ulna (the larger of the fore-arm bones), a hand bone, two toe bones and an ankle bone were found at Kromdraai. Broom estimates that the brain capacity of this creature was about 650 c.c., and that it lived about 900,000 years ago, while the Sterkfontein " Ape Man " lived about 1,200,000 years ago.

The bones assigned to Paranthropus crassidens and to Telanthropus capensis were all found by Broom and Robinson in the cave at Swartkranz about one mile from the Sterkfontein cave.

Broom contributed to the *Illustrated London News* of August 19th, 1950, an article in which he gives pictures of skull, jaw and pelvis, also of the face, with flesh and hair, and in which he writes: " the jaw is really huge, the front teeth are typically human, and even the eye teeth are not larger than in man but the pre-molar and molar teeth, though human in type, are very much larger than in modern man. The face is large and very flat and there are prominent ridges over the eyes and above the nose. . . . We have four brain cases, but all a little crushed. Still these are quite sufficient to show that the brain was large. . . . Though in ' Mrs. Ples ' the brain was only about 500 c.c., the brain in the female Swartkranz ape-man is estimated to have been over 900 c.c. and thus human at least in size. The external ear region is typically human and so is the articulation of the lower jaw. The front of the lower jaw has in some female specimens quite a distinct human chin. It is held by some that this chin has developed with speech. If this is so, our ape-man must be practically human. There is, however, one character that is definitely prehuman. The jaws have been very massive, and the temporal muscles that closed the jaws were very powerful, and while in man they only pass up about half way on the side of the head, in our Swartkranz being they passed right up to the top of the skull, and between them at the top was a well-developed median bony crest, such as is usually seen in gorillas. . . . It had a pelvis that showed it walked more or less upright." These features clearly show that this ape cannot have evolved into a man. Nevertheless Broom wrote:

" we cannot yet say whether modern man evolved from small brained forms like the Sterkfontein being (Plesianthropus) or the bigger brained types like those of Swartkranz (Paranthropus) or Makapan (Australopithecus prometheus). But we can say with certainty that man evolved from a member of this ape-man family."

Broom's assistant and successor, J. T. Robinson, found the fossils which have been named Telanthropus capensis. These are an almost complete lower jaw, part of the snout and the palate, and a bit of a radius (the smaller of the two bones of the forearm). As this snout is rather less protruding than that of Plesianthropus or Paranthropus, Robinson lost no time in telling the world that he had found the " missing link ". He told the reporter of the *Sunday Express*: " Anti-evolutionists will soon have to eat their statements with tomato ketchup. The gaps in the chain of man's development are being filled up. Professor Smith's coelacanth is at the far end of the chain, Telanthropus at the other " (*Sunday Express*, January 4th, 1953).

To the reporter of the *Rand Daily Mail*, Robinson said: " The discovery at Swartkranz . . . of five fossilized remains of Telanthropus capensis—the missing link or transitional man bridging the gap between prehistoric ape-man and early primitive man—was unique and unparalleled in any other part of the world. . . . The finding of a creature combining the characteristics of the ape-man and early primitive man might be one of the most important finds of the century. . . . Most ape-men had become extinct, but at least one had developed into the Telanthropus, the missing link and almost certainly the ancestor of true man, although not necessarily of modern man—Homo sapiens. . . . If a Telanthropus were to walk along a street of a South African city clad in a lounge suit he would, except for his facial features, pass unnoticed in a modern crowd."

On the strength of this, the *Rand Daily Mail* published a big picture of Telanthropus sitting on a hillside.

I wrote to the editor saying that in fairness to the public a picture of the fossil bones of this creature ought to have been published. I also took exception to Robinson's use of the term " ape-man " which should mean either a hybrid between ape and man or an ape that had become almost human. Robinson in reply said he had not seen the picture of Telanthropus and that to him the term " ape-man " means simply " a man which in some ways resembles an ape ".

I submit that the resemblance of these Australopithecinae to man has been exaggerated, and their dissimilarities minimized. As Merson Davies showed at a meeting of the Royal Society of Edinburgh in May, 1949, at which Broom produced a cast of the skull of Plesianthropus, its eyes were specialized for frontal vision with correspondingly reduced olfactory area of the brain just as in apes, and not as in man, where the outer margins of the orbits are more curved than in any anthropoid ape. Broom, who

was at the meeting, made no attempt to controvert this, nor apparently did Robinson when at a subsequent meeting Davies pointed out that the above remarks apply to the Paranthropus.

As Wood Jones has demonstrated, the facial region of these Australopitheci is as in apes and never in man, in that the pre-maxillae form the outer wall of the sockets of their canine teeth, whereas in man it is the maxillae that do this. Also in man the maxillae form the margin of the bony framework of the nose; in the Australopithecinae this is done by the pre-maxillae. Further, the premolar teeth of these apes are three-rooted as are those of all apes. This is not the case in any known race of man. Normally the premolars are single-rooted in man.

As fossils of these apes seem to be numerous in Transvaal, there is every prospect of more fossils of their long bones being found. Meanwhile as nothing approaching an artefact has been found in association with any of these apes, it is premature to suggest that they may be ancestors of man.

10. Keith's Latest Theory

Sir Arthur Keith has formulated yet another theory of human evolution which he calls the " Group Theory of Human Evolution ". He sets this forth in a volume of 450 pages called *A New Theory of Human Evolution* (1949). He is impressed by Broom's South African " ape-men ", which he calls Dartians. He writes (p. 209): " The South African anthropoids seem to me to represent the stage reached by human ancestry in the Miocene period. That the representatives of this Miocene phase of man's evolution should have survived into the Pleistocene period does not seem to me an improbable assumption." What he calls his scheme " assumes that up to the end of the oligocene period the great anthropoids (the gorilla, chimpanzee and orang) and man were all represented in a common ancestry, all being strictly arboreal in habit . . . the limbs and bodies of the common ancestry were then undergoing postural modifications, the lower limbs of the pre-human group or groups becoming more and more the chief means of support in climbing and at the same time becoming better fitted to serve as organs of progression on the ground . . . before the end of the Miocene period the lower limbs of the pre-human groups had become completely adapted for a life on the ground." Having thus got early man firmly on his hind legs, Keith believes " there was first a long primal period when mankind was separated into small local groups or communities; this period is estimated to have lasted at least a million years. It was during this period that man made his major evolutionary advances. The post-primal period has endured for less than 10,000 years, it has led to a revolution in the mode of evolution ". Keith assures us that " in the clash and turmoil which disturbs the peace of the modern world we are hearing the creaking wheels of the machinery of evolution ". These evidently are in sore need of lubrication!

11. Schepers' Theory

W. C. H. Schepers, who collaborated with Broom in writing *The South African Fossil Ape-Man*, thinks that the Australopithecinae are man's nearest relatives, but not man's ancestors. Nevertheless he thinks that Plesianthropus may have had some kind of speech and that his brain shows clearly that the ape-man walked and ran on his hind legs and used his hands for the manipulation of tools. Schepers has his own theory of human evolution, which is that evolution consists of a " rhythm of change, a slowly progressive, vital, pulsating urge keeping time to a slow swinging of the pendulum between extremes of pedomorphism (immaturity) and gerontomorphism (senescence), and between microcephalism and macrocephalism. The pedomorphs can breed with the gerontomorphs. The pedomorphs have the advantage in that the plasticity and educability of the brain are retained for a comparatively long period, while the gerontomorph has more brain matter, so more meroblasts develop in it. Thus superimposed on this alternation of pedomorphism and gerontomorphism there is a steady and selective growth of the brain. But natural selection has weeded out the extreme pedomorphs and the extreme gerontomorphs. He considers that all the extinct higher primates of which fossils have been found are too specialized to be ancestors of man. He points out that the pre-bushmen of South Africa had bigger brains than any living men. He classes Homo sapiens as a macrocephalic pedomorph and the australopithecinae as microcephalic gerontomorphs. These he says have " crystallized for us a critical phase in the evolution of the pithecoid homunculi, where reversion to ape form no longer becomes possible ".

12. Straus's Theory

W. Straus Jr. is of opinion that none of man's ancestors were brachiators or anthropoid apes. In his view, in the light of available knowledge, the most reasonable theory derives the hominid line of descent from some sort of catarhine primate rather than from an anthropoid ape of any sort. He writes (" The Riddle of Man's Ancestry," *Quarterly Review of Biology*, 1949, p. 216): " That man is a member of the catarhine group of primates admits of no reasonable doubt. But that the hominids are descended from animals that could be classified as anthropoid apes, on the other hand, has in no wise been established, the categorical assertions of some writers notwithstanding. Indeed the large number of basal primate characters which man possesses challenges the rationality of such a conception. Rather they suggest that the phylogenetic line leading to man had become independent of the catarhine stock before there were actual anthropoid apes, not only at a pre-dryopithecine stage, but even before the Hylobatidae-Gibbons."

Straus suggests that this independence of the hominid line may date from the Oligocene period. He bases this opinion on the fact that man

both living and fossil, exhibits features more primitive than those of the anthropoid. He lists no fewer than twenty-two such characters.

Unlike many formulators of theories of the origin of man, Straus is not dogmatic. He closes his statement of his theory by writing: "I wish to emphasize that I am under no illusion that the theory of man's ancestry which I favour at the present time, can in any way be regarded as proven. It is, at the best, merely a working hypothesis whose final evaluation must be left to the future.... What I wish specially to stress is that the problem of man's ancestry is still a decidedly open one, in truth a riddle. Hence it ill behoves us to accept any premature verdict as final, and so to prejudice analysis and interpretation of whatever Palaeontological finds may come to light as the orthodox theory (i.e. that man is derived from an anthropoid ape) has so often done and is still doing. One cannot assume that man is a made-over anthropoid of any sort, for much of the available evidence is against that assumption."

Conclusion

The fact that more than thirty theories (all but one of which at best must be wrong) have been put forward relating to the origin of man is a sign of the baleful influence of the transformist doctrine on zoology.

In the synopsis printed by the University of Edinburgh of a course of lectures on "The Palaeontology of the Primates and the Problem of Human Ancestry" that were delivered in April and May, 1953, by W. E. Le Gros Clark, Professor of Human Anatomy, University of Oxford, the following passages occur: "Since one of the principal aims of taxonomy is to reflect evolutionary relationships, it must take account of palaeontological data," and "The study of Palaeontology, by the nature of the material, is concerned with the evolutionary development of anatomical structure only (and of such indirect inferences as may be drawn therefrom)."

Is it too much to hope that before long biologists will dispense with the transformist spectacles through which they look at nature, and try to see and describe natural objects as they are and not as they ought to be according to the theory of evolution?

Over fifty years ago Reinke declared: "The only statement consistent with her dignity that Science can make, is to say that she knows nothing about the origin of man."

This assertion is as irrefutable to-day as it was in 1902 when it was made.

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OF THE

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AT

THE CAXTON HALL
WESTMINSTER, S.W. 1

ON

MONDAY, 7th DECEMBER, 1953

Robert L. F. Boyd, Ph.D., B.Sc., A.C.G.I., A.M.I.E.E., in the Chair

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RECENT THEORIES OF THE ORIGIN AND NATURE OF THE UNIVERSE

By W. E. FILMER, B.A.

THE VICTORIA INSTITUTE
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SYNOPSIS

Several independent lines of evidence point to an age of the universe in the region of 4,000 million years. Gamow's theory that the universe began at this date as a very hot and dense neutron gas, although highly speculative, does appear to provide a better explanation of the relative abundances of the elements than any other current theory. Einstein's general theory of relativity, originally put forward as a statement of gravitational law, allowed for a cosmic force of repulsion. It still remains an open question whether or not this force exists, but it is no longer necessary to invoke it to explain the observed recession of the galaxies. Hoyle's theory of an expanding universe is superfluous for the same reason. Hoyle's theory of continuous creation implies that the large scale appearance of the universe should be the same at all times and in all places; but the Stebbins-Whitford effect indicates that the more remote elliptical galaxies appear different from near ones, and this can be explained as a result of the time lag in our seeing them. It is concluded that a steady state universe is not supported by the balance of scientific evidence.

The last twenty-five years have seen a tremendous advance in our knowledge of the nature of the universe. On the one hand the giant 100-inch and 200-inch telescopes in America have enabled astronomers to extend their exploration of space to a distance of more than 1,000 million light-years, while on the other discoveries in atomic physics have increased our understanding of the nature of matter and energy. All this fresh knowledge forms the raw material from which have been woven new theories about the origin and nature of the universe.

The 100-inch telescope at Mount Wilson made possible the discovery that stars are grouped together into galaxies, originally called nebulae on account of their misty appearance. Each galaxy consists of from 10 to 100 thousand million stars, and may range in size from a few thousand up to two hundred thousand light-years across. The sun is a star of average size situated about two-thirds of the distance from the centre to the outer rim of a large spiral nebula called The Galaxy. The misty belt of stars, known as the Milky Way, which extends across the sky, constitutes the spiral arms of The Galaxy; to right and left of the Milky Way the density of stars falls off rapidly as we look out between them into relatively empty space.

The distances of other galaxies are so great that they cannot be measured by the ordinary parallax, or range-finding method, but have to be estimated from their brightness, or from the brightness of individual stars and other objects in them. This depends on a knowledge of the actual brightness of similar stars in our own galaxy which are near enough to us for their distances to be measured accurately. Recent observations have led astronomers to revise their estimates of the distances of the galaxies, and this revision is likely to have an important bearing on our assessment of current theories.

The Expanding Universe

One of the earliest discoveries made with the 100-inch telescope was that most of the galaxies appear to be moving away from us and likewise from one another—the whole universe appears to be in a state of expansion. The speed of a star or galaxy moving along the line of sight can be measured from the change in colour of the various spectral lines which are characteristic of the spectrum of each element when it becomes incandescent—a deviation towards violet indicates a compression or shortening of wave-length due to the approach of the star, and a shift towards red, a lengthening of wave-length due to recession. All the more remote galaxies show a shift towards the red, and the shift increases the further away the galaxy is situated. Although suggestions have been made to account for this in some other way, a number of reasons can be given why these introduce more difficulties than they seek to solve, and in the theories considered in this paper it is accepted that the red shift is a true indication of velocity.

When the Mount Wilson astronomers, Hubble and Humason, began measuring the distances of the galaxies and calculating their speeds from the red shift, they were soon able to formulate what is now known as Hubble's law, which states that the speed of recession is proportional to the distance of the galaxy. We might compare the situation with one

in which a number of cars are moving out along several main roads diverging from a central city. We observe that each car that is 10 miles from the city is going at 10 m.p.h. and each one 20 miles out is going at 20 m.p.h. and so on. If each car had been moving at a uniform speed for the past hour, a simple calculation would show that all of them set out from the city at the same time one hour previously. Of course we cannot be certain that they have been moving at a constant speed, but one thing is clear: at some time in the past they must all have been crowded together in the city. In the same way we may reasonably conclude that at some time in the remote past all the galaxies in the universe were gathered together in a small space.

Now one of Newton's laws of motion, which every experiment has shown to be true, states that any object will continue to move with uniform velocity unless it is acted upon by a force. The only force of which we have any definite knowledge acting on the galaxies is that of gravity. This would tend to draw the galaxies together and cause their present movement to slow down, but in actual fact they are now so far apart that the effect is negligible. It is true that in some theories which we shall consider later, a cosmic force of repulsion is assumed which causes the galaxies to fly apart at ever increasing speeds, but it is not sound science to make more assumptions than are necessary to explain the facts, so for the present we shall ignore cosmic repulsion.

Assuming, then, that the galaxies are acted upon by no force other than gravity, it is possible to calculate from their present distances and speeds that they were all crowded together in a small space about 3,500 to 4,000 million years ago. Scientific theory cannot go any further back than a stage in which all the matter in the universe was packed together as tightly as anything we can conceive, and that point in time we may reasonably call the moment of creation.

The Age of the Universe

Having arrived at the age of the universe in this way, Professor Coulson, in a recent broadcast[1], went on to point out that several other methods of estimating its age are open to us. For example, we know of a number of star clusters such as the Pleiades, comprising some 200 members, and it can be shown that these must eventually become scattered under the tidal effects induced in them by the other stars of The Galaxy. It has been calculated by B. J. Bok[2] and others that such clusters could not remain together for more than 3,000–5,000 million years, and if our galaxy were any older than this, such star clusters would no longer exist. In fact several hundred of them are known, so our galaxy cannot be older than 5,000 million years.

A second line of evidence arises from the fact that a great many of the stars we see are really double—they consist of a pair of stars moving round

[1] C. A. Coulson, *The Listener*, 21 May 1953, p. 839.

[2] B. J. Bok, *Mon. Not. R. Ast. S.* (1946), **106** 61–75.

each other in some kind of orbit. As in the case of the clusters, it can be shown that in the course of time pairs of stars of this kind would become more widely separated, so that after a long time there would be very few double stars left. The high proportion of close pairs that are observed puts an upper limit to the age of our galaxy which once again comes out to be only a few thousand million years.

A third clue, quite independent of the others, is derived from our knowledge of the way stars generate the energy they emit by converting hydrogen into helium. It is believed that when their supply of hydrogen is nearly exhausted, they would swell up to an enormous size and become a type of star known as a red giant. From the size and brightness of a star we can calculate the rate at which it is emitting energy, and so arrive at the rate at which it is producing it from hydrogen; we can also arrive at the proportion of hydrogen already used up, and so work out the age of the star. The oldest stars we know, the red giants whose hydrogen is almost exhausted, turn out to be rather less than 4,000 million years old.

Thus by three different methods we are led to the same result for the age of our galaxy, but this does not necessarily mean that all other galaxies are the same age. But when it happens that the age of the universe as calculated from the expansion comes out to the same figure, we must admit, as Professor Coulson pointed out that, "This agreement is too imposing to be treated as a mere coincidence."

But in addition to the astronomical facts about which Professor Coulson was speaking, there is also geological evidence from which we can calculate the age of the earth. Geologists have for many years been using what is known as the radio-active method of dating rocks, and this has become sufficiently refined to show that the oldest known rocks were laid down about 2,000 million years ago. More recently a similar method has been worked out by Professor Holmes of Edinburgh[3] which enabled him to find not only the age of the rocks, but the age of the material from which they were formed. His calculations were based on the analyses of 25 samples of lead ore from different parts of the world, and he arrived at a figure of 3,350 million years as the age of the earth's crust. Doubt was at first cast on this result by Professor H. Jeffreys,[4] who put forward two alternative methods of calculating the age of the earth which gave results differing from those of Holmes. But Holmes later pointed out[5] that one of these methods was wrong in principle, while in the second Jeffreys had made an arithmetical error—when this was corrected the result was consistent with Holmes' original figure. F. G. Houtermans,[6] working independently from the same data, also arrived at the same result as Holmes.

[3] A. Holmes, *Nature* (1946), **157**, 680.

[4] H. Jeffreys, *Nature* (1947), **159**, 127.

[5] A. Holmes, *Nature* (1949), **163**, 453.

[6] F. G. Houtermans, *Z. Naturforsch.* (1947), **2a**, 322.

Now the universe must be at least as old as the earth, so once more we are back at the same figure of rather less than 4,000 million years. The fact that so many independent calculations lead to the same age for the universe lends strong support to the idea that about 4,000 million years ago something happened which started the universe off as we know it.

The Origin of Matter: Gamow's Theory

Some idea of how the universe began may be got from tracing the expansion back as far as is conceivably possible to a state in which all the matter was as tightly compressed as the elementary particles in the nucleus of an atom. The most widely accepted theories in recent years have been based on this suggestion which was first put forward by the Belgian physicist Lemaître in 1931. He imagined one gigantic atom which, on account of its size, was most unstable, and exploded, splitting up into ever smaller and smaller fragments until ultimately it had broken down into the atoms as we know them today. The gas or dust originally so formed would condense into stars and galaxies which would continue to fly apart as a result of the original explosion. One of the main objections to this theory was that it was unable to account for the proportions, or abundances of the various kinds of atoms which we find. It would result in too many of the heavier elements and too few of the lighter ones.

Subsequently George Gamow[7] and his colleagues in America suggested that since in the nucleus of an atom the positive and negative particles, the protons and electrons, amalgamate to form neutrons, the universe must have started as a tightly compressed mass of neutrons. For purposes of calculation this could be regarded as an extremely dense gas at a very high temperature. During the first hour of the expansion of this gas all the neutrons would split into protons and electrons, that is to say into hydrogen. But before all the neutrons had split, there would be a mixture of neutrons, protons and electrons which would be ideal for the formation of other elements so long as the temperature and density were sufficiently high to keep them colliding with one another with sufficient force.

Although this chaos of colliding particles may appear at first sight to be hopelessly intractable, it does not, in fact, involve anything but comparatively simple processes which have been studied in the laboratory. Experiments with such high speed particles during the past twenty years provide the necessary knowledge of what the probable result of a collision between any two particles will be, provided their speeds are known. The only difficulty lies in the amount of calculation necessary to discover what the final mixture of gases will contain, when the temperature has fallen too low for collisions to be effective in building atoms. Gamow had the necessary calculations done on an electronic computing machine, and showed that, provided that the temperature and density of the original

[7] G. Gamow, *Creation of the Universe* (1952), p. 57.

neutron gas had certain values, the theoretical amounts of the different elements resulting from this process corresponded remarkably well with the actual proportions found to exist in the universe.[8]

Describing conditions during this first hour as being similar to those existing in the centre of an exploding atom bomb, Gamow points out that an enormous amount of energy would be released in the form of short-wave radiation. This energy, according to Einstein's principle, has mass, and there would be so much of this radiant energy present, that its mass would exceed by a large factor the mass of the ordinary atomic matter. However, as the gas consisting of the newly formed atoms continued to expand, its temperature would become lower and lower, and the amount of radiant energy would become less and less, until eventually a time would come when the mass of the radiant energy would fall below the mass of the ordinary matter. This was a critical stage in the history of the universe, for radiant energy exerts a pressure in the same way as a gas, and once the pressure exerted by the radiation ceased to preponderate in driving the atoms apart, the force of gravity could become effective in drawing them together. The result of this would be that the gas which had hitherto filled the universe uniformly, would break up into separate gigantic clouds. While these clouds would continue to fly away from one another, gravity would prevent each one from expanding any further and it would remain the same size. The continued action of gravity would break up each cloud into globes of gas which would become stars. Thus we have an explanation for stars being grouped together in galaxies which are themselves flying apart.

Gamow goes on to calculate[9] that the amount of matter in each cloud would be enough to form several million stars the size of the sun. Although this number is not quite as great as the number of stars in the existing galaxies, he gives reasons why the calculated value falls short of the actual value, and expects that when these other factors have been taken into account, the figures will agree.

According to Gamow[10] the critical stage, when the original uniform gas broke up into separate clouds, was reached about 30 million years after the creation. He calculates that the density of the gas at that stage was about the same as the average density of matter in a galaxy today, thus confirming his theory that from that time each individual cloud expanded no further. Also, since the average distance between one galaxy and another is today about 100 times the average diameter of a galaxy, the date of separation was about one-hundredth of the present age of the universe; this would give a rough estimate for the age of the universe as 3,000 million years, which is in reasonable agreement with the other estimates we have discussed.

[8] G. Gamow, *Creation of the Universe* (1952), pp. 65–69.

[9] *Ibid.*, p. 77.

[10] *Ibid.*, p. 78.

Theories of The Expanding Universe

The theory of the origin of the universe which we have so far been considering was based on the assumption that the galaxies are moving apart with a speed which has remained constant ever since the initial explosion. From their present distances and speeds we were able to calculate that this explosion must have taken place about 4,000 million years ago, and this was in agreement with the age of our galaxy as estimated by entirely independent means, as well as with the age of the earth. This agreement has, however, only very recently become possible. For the past twenty-five years the distances of the galaxies were believed to be only about half of those on which our calculations were based, and consequently they allowed only half the time for the period of expansion, namely less than 2,000 million years. This was evidently impossible, because it was even less than the age of the earth. In order to get round this discrepancy it was necessary to put forward theories which assumed that the galaxies were moving more slowly in the past: that is to say that instead of moving with uniform speed, they were accelerating, and a cosmical force of repulsion was postulated to account for this acceleration. It so happened that Einstein's general theory of relativity allowed for the possibility of just such a force of repulsion. It is, however, not an essential part of the theory (for the cosmical constant may be zero), but since the astronomical data appeared to demand it, it was incorporated into most theories of the expanding universe.

The Origin of Matter: Hoyle's Theory

One such theory which has received much publicity is Hoyle's theory of continuous creation. He put forward two main objections to any theory such as Gamow's.[11] The first of these was based on the erroneous distances of the galaxies: any theory, he said, which leaves out cosmical repulsion gets into difficulties because the period of expansion comes out less than the age of the stars and of the earth. His second objection was that in the early stages of the expansion the temperature (or the amount of radiant energy) would not have been sufficient to prevent gravity causing condensations of gas whose density would be much higher than the average density of the galaxies.

As we have seen, the first of these objections is no longer valid. Observations made by Alfred Behr[12] in Germany, S. C. B. Gascoigne[13] in Australia and just recently by the American astronomers,[14] have led to the conclusion

[11] F. Hoyle, *Nature* (1949), **163**, 196–7.

[12] A. Behr, *Astron. Nach.* (1951), **279**, 97–104.

[13] Gascoigne and Kron, *Pub. Ast. Soc. Pacific* (1952), **64**, 196–200.

[14] E. P. Hubble, *Observatory* (1953), **73**, 102–3.

that the distances of the nearest galaxies must be doubled, and with them the distances of all other galaxies.

As regards the second objection, Gamow gives a formula[15] for the temperature of space at any moment after the creation. From this formula he calculates that the temperature (and likewise the amount of radiant energy) would, in fact, be sufficiently high to prevent condensations until the density of the original gas had fallen to the present average density within a galaxy. This calculation can be checked, because the same formula also gives the temperature of space today when the universe is 3,000–4,000 million years old. This comes out to be 40–50 degrees absolute, a temperature which Gamow says " is in reasonable agreement with the actual temperature of interstellar space."[16] Here we can see the fundamental difference between Hoyle and Gamow, because Hoyle is not prepared to admit that the temperature is now more than 1 degree absolute.[11]

As a consequence of his second objection, Hoyle is not able to believe that the average density of matter in the universe could have been any greater in the past than it is now. Although galaxies are continually flying out of any given volume of space, he believes that the number within that volume remains the same. This requires that new galaxies must continually be formed to replace the old ones, and that hydrogen is being continuously created to provide the raw material. In this way he avoids the idea of a creation at a particular epoch in the past, and supposes that the universe has existed eternally.

Since Hoyle's theory postulates only the creation of hydrogen atoms, he is obliged to give some explanation of the origin of the other elements. There is no difficulty about helium, for it is agreed that this is being formed from hydrogen in the centres of the stars, but for the formation of the heavier elements temperatures of over 1,000 million degrees accompanied by very high densities are necessary, and it is difficult to find anywhere in the universe where such conditions exist. Hoyle supposes that they would be found in the centre of a very massive star when its hydrogen has become exhausted.

It is believed that so long as a star has a supply of hydrogen which can be converted into helium, its internal temperature will remain sufficiently high to keep it blown up to a large size; but once this source of energy fails, the central portion of the star would collapse inwards under gravity. Now at temperatures of several million degrees which prevail in stars the atoms are rushing about at such high speeds that their nuclei are stripped of all their satellite electrons. Consequently when the collapse occurs, a large number of these bare nuclei will pack into a very small space, and the result is an extremely dense star, a type known as a white dwarf.

[15] G. Gamow, *Op. cit.*, p. 142–3.

[16] G. Gamow, *op. cit.*,, p. 42.

According to Hoyle's theory, the rise in temperature and density resulting from such a sudden collapse would be sufficient to convert helium into the heavier elements. At the same time the sudden release of energy provided by the collapse of the core would blow the outer layers of the star off into space. Extremely violent explosions like this are known to occur and such stars are called supernovae. Hoyle suggests that together with the outer layers some of the newly formed elements from the core would also be blown out into space. In the course of time sufficient of these heavy elements would accumulate in the general background of new hydrogen to affect the constitution of any stars which began to form.

A study of Hoyle's original paper[17] leaves one in doubt whether his theory is able to account for the total quantity of elements other than hydrogen and helium known to exist in the stars. As he points out, in any newly formed galaxy the first stars to form would consist entirely of hydrogen, and only after a number of supernova explosions had occurred would there be any other elements available. Such explosions are rather rare occurrences—there being only one in about 500 years in a whole galaxy. But by supposing that each explosion produces a quantity of heavy elements equal to ten times the mass of the sun, Hoyle calculates that after 10,000 million years the amount of these elements would reach 0.1 per cent of the hydrogen present. There is already more than this in the existing stars, although many of them must have been among the first stars to be formed, and so should contain none, or very little of the heavy elements. Furthermore, it seems very doubtful whether each supernova could produce such an enormous quantity of heavy elements in the outer layers, as these would be formed mainly in the central core.

Nor is this the only difficulty with which Hoyle has to contend. He finds that the conditions required for generating the light and medium weight elements would not be suitable for producing the heavier ones. Consequently he is obliged to postulate two different processes which take place in entirely separate stars. As Gamow points out, this " sounds like the request of an inexperienced housewife who wanted three electric ovens for cooking the dinner: one for the turkey, one for the potatoes, and one for the pie. Such an assumption of heterogeneous cooking conditions, adjusted to give the correct amount of light, medium-weight and heavy elements, would completely destroy the simple picture of atom-making by introducing a complicated array of specially designed ' cooking facilities '."[18] Gamow claims that his own theory is capable of explaining not only the general trend of atomic abundances, but even the proportions of each individual element.

[17] F. Hoyle, *Proc. Phys. Soc. London* (1947), **59**, 972–8.

[18] G. Gamow, *Op. cit.*, p. 52.

Consequences of the Alternative Theories

It was pointed out by Professor McCrea in a recent paper read before this Institute[19] that it should be possible to distinguish between a universe which had a beginning when all the matter came into existence at once, and a universe which had no beginning and in which matter is being created continuously. In the former case all the galaxies would be of approximately the same age, whereas in the latter they would range from very young to extremely old—in fact, some would be infinitely old, but it would be unlikely that any very ancient galaxies would be in our own neighbourhood.

Now owing to the time taken by the light from the more remote galaxies to reach us, we actually see them not as they are now, but as they were many millions of years ago. Consequently, if the universe had a beginning, and the galaxies are now all about the same age, the more remote galaxies should appear to be younger than the nearer ones. If on the other hand galaxies are constantly coming into existence, a census of galaxies at any distance or at any time would always contain galaxies of all ages. It would seem, therefore, that to decide the issue between one theory and the other we must have a means of measuring the relative ages of the galaxies.

According to the continuous creation theory, the oldest galaxies should be the biggest, because they would be continually accumulating more matter by gravitation. When we come to look at the galaxies we find that they do, in fact, vary in size to some extent, but the variation is not greater that it might have been by accident had they all been formed at the same time. The variation in size is not sufficient to decide the issue.

Another possible clue might be the shape of the galaxies. About one in five is elliptical or spherical and the other four are spiral with a considerable variation in the arms, some being tightly coiled and some very loosely. Whether or not the different types represent an evolutionary series is open to question: some people[20] suppose that elliptical galaxies evolve into spirals, while others believe[21] that spirals develop into ellipsoids. In view of our present lack of knowledge about how galaxies evolve or change their shape, it would seem impossible for any observational evidence at the present time to decide between one theory and the other. Curiously enough an interesting phenomenon has recently been observed which is regarded as providing strong evidence against the theory of continuous creation.

A few years ago the American astronomers, J. Stebbins and A. E. Whitford,[22] began analysing the light from the nebulae by photographing them through six different coloured filters. In this way they found that elliptical galaxies appear progressively redder the further away they are,

[19] W. H. MacCrea, *Trans. Vic. Inst.* (1951), **83**, 119.

[20] G. Gamow, *Op. cit.*, p. 80.

[21] C. v. Weizsäcker, *History of Nature* (1951), pp. 74–88; P. Couderc, *Expansion of the Universe* (1952), p. 41.

[22] Stebbins and Whitford, *Astrophys. J.* (1948), **108**, 413.

but the spiral galaxies do not show this change. For example, they measured the colours of four elliptical and seven spiral galaxies which they knew to be all at approximately the same distance, because they lie in a cluster in Corona Borealis. Only the elliptical galaxies showed the reddening effect—the light from the spirals did not. Similar measurements of light from other clusters of galaxies whose distances are known show that the amount of reddening is proportional to the distance.

This effect should not be confused with the red shift in the spectral lines from which the speed of the galaxies is measured. It is, of course, true that the shift of the whole spectrum towards the red might make a galaxy appear redder, but what is observed is an additional reddening in excess of this. For example, a galaxy in Boötes shows a red shift of 23 per cent in the lines, but the proportion of red light is increased by 61 per cent. Observationally the effect is similar to the difference between the sun at midday and at sunset. The spectral lines are not affected, but we see a greater proportion of red light in the evening because dust in the air cuts out some of the blue light.

Now there can be only two ways of explaining why a remote galaxy looks redder than a near one: either it was emitting redder light, or the light has undergone a change on the way; some blue light, for example, may have been lost due to obscuring matter in space, in the same way as atmospheric dust causes the reddening of the sun. But if the light had in any way been altered on the way, the light from the spiral galaxies would have been affected to the same extent, so this explanation must be ruled out. We are, therefore, left with the only other solution, namely that the remote elliptical galaxies must have been emitting light that was redder than that now emitted by nearer ones.

It follows that whatever theory may be put forward to account for the redder light of the elliptical galaxies, it must in any event be incompatible with a steady state universe of Hoyle's type, for in such a universe the average characteristics of each type of galaxy must be independent of time and distance. If, however, a good reason can be given why the light from the spiral galaxies would not change over a period of several million years, while the light from elliptical galaxies might be expected to do so, then we can be reasonably certain that the effect is an evolutionary one, even though we might not be able to understand fully the evolutionary process causing it.

It has been known for some time that the stars of which the arms of the spiral galaxies are composed differ from those in the central nuclear region, and that the latter are similar to those in the elliptical galaxies. The bulk of the light from the spiral arms is supplied by comparatively few very bright stars, called white or blue giants, but in the nuclear region and in elliptical galaxies most of the light is provided by red giants. The white or blue giants are consuming their hydrogen at such a rate that their life-span cannot be more than a few

hundred million years, but as they burn out, they are probably being continuously replaced by new stars forming from the large amount of interstellar gas and dust which exists in the spiral arms. So great is the quantity of this interstellar dust that it completely prevents us from seeing the nucleus of our own galaxy, or seeing other galaxies which lie in any direction near the plane of the Milky Way. Photographs of other spiral galaxies seen edge on show a dark band across the nucleus where the dusty arms cut across it.

This interstellar dust and gas does not appear to be present in elliptical galaxies, and consequently no new stars can form, so the average age of the stars steadily increases. In the spiral arms the birth of new stars may keep the average age almost constant for as long as there is a supply of material. There is, therefore, every reason to expect an evolutionary change in the appearances of the elliptical galaxies, but not in the spirals.

The explanation put forward at present to account for the redness of the distant elliptical galaxies is that at the time when their light was emitted they contained a larger proportion of red giants than do the nearer galaxies; in the latter a great many are believed to have collapsed meanwhile into white dwarfs. It would appear, therefore, that the first stars to form were those in the elliptical galaxies and in the nuclear regions of the spiral galaxies, and that later new stars have been continually forming in the arms of the spirals where alone the necessary raw material is present.

Summary of Scientific Arguments

We have seen that several independent lines of evidence point to an age of the universe in the region of 4,000 million years: the age of the earth gives a minimum of 3,350 million years, the astronomical facts agree in placing a maximum age of 4,000–5,000 million years, and the latest estimates of the distances and speeds of the galaxies point to a date between 3,500 and 4,000 million years ago when the universe began. In view of these consistent results it is reasonable to suppose that at that time some event did take place which we may call the creation, and that the universe has not been in existence for an infinite time.

To arrive at this remarkable agreement between so many widely different methods of approach it was not necessary to suppose that the galaxies are accelerating under a force of cosmical repulsion. Although the possibility of such a force was allowed for in Einstein's general theory of relativity, it is not a necessary part of the theory. It was invoked to explain a discrepancy which no longer exists. Consequently any theory such as Hoyle's which requires an acceleration of the galaxies is making an unnecessary assumption, and for that reason is scientifically unsound.

As regards the origin of matter, Hoyle's theory does not appear to explain satisfactorily how the heavier elements came to be formed.

Gamow's theory that the universe began as a very hot and dense neutron gas, although rather speculative, appears to provide such an explanation which leads to an agreement with the actual amounts of these elements found in the universe.

Finally the theory of continuous creation requires that the large scale appearance of the universe should be the same at all times and at all places; but Stebbins and Whitford have found that the distant elliptical galaxies are not the same colour as the nearer ones, a fact which can be explained in terms of an evolutionary change with time.

It would be difficult to find a more authoritative, or a more severe condemnation of the continuous creation theory than that delivered by Professor Dingle in his presidential address to the Royal Astronomical Society earlier this year.[23] He said that he had a responsibility as president of one of the foremost scientific societies of the world, because the ideas to which the society gave publicity were accepted as genuine scientific pronouncements, and as such influenced the thinking of philosophers and theologians. When, therefore, it happened that the society had published so-called " principles " which were comparable with the " principle " that all celestial movements are circular and all celestial bodies are immutable, it became his duty to point out that this was the kind of thing that science was created to displace. " It is hard for those not acquainted with the mathematics of the subject," he said, " to credit the fact that the idea of the continuous creation of matter, whether right or wrong, is not a legitimate inference based on scientific observation, but is based merely on the fancy of a few mathematicians who think how nice it would be if the world were made that way."

Philosophical Arguments

Before we consider the philosophical aspects of the subject we must be clear what the word creation means as it is used in the two theories discussed. There is no doubt that in Hoyle's theory he means that hydrogen atoms come into existence from nothing—at one moment they are not there, at the next they are. Gamow states that he does not mean this, but rather a " making something shapely out of shapelessness."[24] However, he is not concerned with discussing how his original neutron gas came into existence, but with describing how, once it was there, it developed into the universe as we know it. If, however, we examine the situation at the beginning of his " creation ", we find a dense gas of neutrons whose origin cannot be explained. It could not, for example, have arisen from a previous compression, like the expansion in reverse, for this would only lead back to a state in which the universe was empty but matter came together at high speed from infinity—a statement which

[23] H. Dingle, *Observatory* (1953), **73**, 46–47.

[24] G. Gamow, *Op. cit.*, Preface to 2nd Printing.

seems to be nonsense. Nor could Gamow's neutron gas have existed for any length of time in its highly compressed condition, for as soon as it existed it must start to expand. We must conclude, therefore, that it did not exist before the beginning of the expansion, but came into existence at that moment. If we confine the word " creation " to describe this particular phenomenon, we shall be using it in the same sense as Hoyle.

If the theory of continuous creation is not a legitimate inference based on scientific observation, we may now enquire what philosophical preferences may have lead to its adoption. " On philosophical grounds," says Hoyle, " I cannot see any good reason for preferring the big bang idea. Indeed, it seems to me in the philosophical sense to be a distinctly unsatisfactory notion, since it puts the basic assumption out of sight where it can never be challenged by a direct appeal to observation."[25] But Hoyle's own basic assumptions are equally out of sight: first he assumes the existence of a cosmic force of repulsion which only becomes effective at a range of millions of light-years, and secondly he supposes that one hydrogen atom is created per litre of space in 250 million years. Since he is himself obliged to admit that " it would be quite impossible to detect such a rate of creation by direct experiment,"[26] we cannot take seriously his plea for a direct appeal to observation.

The truth is, as Professor Dingle said, " The authors of this new cosmology seem to be primarily concerned with the question ' How can we conceive that this changing world began.' Tacitly assuming that the universe must conform to their tastes, they declare that there was no beginning and will be no end to the material universe."[23] Now the knowledge that the universe had a beginning in time when it was created out of nothing is not only a very strong argument for the existence of God, but it also provides reason for us to believe that He existed before it began and therefore transcends it. As Sir Edmund Whittaker pointed out, " it implies that God is not Nature, and Nature is not God; and thus we reject every form of pantheism, the philosophy which identifies the Creator with creation."[27]

These theological implications are evidently Hoyle's real difficulty. By concluding his book, *The Nature of the Universe*, with an attack on religion in general and the Christian Faith in particular, he has shown that he strongly objects to the idea of God. Consequently, since he cannot get away from the fact of creation, he is obliged to resort to a novel form of pantheism in which he can reduce the Creator to the status of an automatic machine for the production of hydrogen atoms.

[25] F. Hoyle, *Nature of the Universe*, p. 98.

[26] *Ibid.*, p. 99.

[23] H. Dingle, *Observatory* (1953), **73**, 46–47.

[27] E. T. Whittaker, *Beginning and End of the World*, p. 40.

Historical

The argument about whether or not the universe had a beginning is not new. The ancient Greek philosophers were unanimous in their belief that matter had existed eternally, for this followed directly from their basic axiom that " nothing can come into existence out of what does not exist." When the Greeks spoke of creation they meant nothing more than the bringing of order out of chaos, a condition in which they believed matter to have existed eternally.

The conception of a beginning when God created the heavens and the earth (or space and matter) out of nothing, was of purely Hebrew origin. The early Christians held that this belief was based on revelation, and could not be established independently by rational science, though this did not prevent some of them from devising philosophical arguments to support their view. It was not until early in the nineteenth century that any scientific reason could be given why the material universe should not have existed eternally: it was then that the discovery of the second law of thermodynamics was made, but even then it was many years before this was used to argue that the universe was " running down " like a clock, a fact which implied that at some time, not infinitely remote, it must have been " wound up."

The discovery of the expansion of the universe, far from being evidence against a beginning, provides, in fact, a very strong argument in favour of it, for if the motion of the galaxies be traced far enough back, there must have been a time when they were all crowded together to a maximum degree. Had it not been for erroneous measurements leading to an age for the universe which was less than the age of the earth, it is unlikely that the conception of cosmic repulsion, on which the continuous creation theory depends, would ever have gained favour.

It is interesting to note that by declaring that the universe had a beginning, the Bible anticipated modern science by some thousands of years, and when it is further realized that this doctrine was taught in face of the strongest possible opposition from Greek philosophy, it must be admitted that divine revelation alone can have been the source of that knowledge.

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MONDAY, 15th FEBRUARY, 1954

J. Reginald Hill, B.A., in the Chair

THE VALUE OF RELIGIOUS INSTRUCTION IN EDUCATION

By

E. W. CRABB, Dip.Litt., Dip.Th.

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SYNOPSIS

1. The history of Religious Instruction in English Education

The importance of the religious influence in the development of our national educational system is recognized on all sides, and to this recognition may be attributed the present unique position in the schools, where the Act of 1944 requires that Religious Instruction shall be given and that the school day shall commence with a corporate act of worship.

2. Various Conceptions of the Aims of Education

The official view of the importance of religious instruction is illustrated by quotations from various reports. The value of the Agreed Syllabuses is discussed and the problem connected with the differing standpoints adopted in teaching different subjects of the curriculum is faced. Religious education is not a utilitarian subject designed to make individuals become better citizens or family men, but should present a cure for man's deepest ills.

3. The Deeper Requirements of a Christian Education

An acknowledgment of the supremacy of God in all life is a basic requirement of Christian education. The Old and New Testament teaching should illustrate the possibility of a close relationship between God and man, and the obstacles to that communion. The redemptive purpose of God for fallen man must emerge from any true and adequate presentation of the Bible record. The knowledge that there is a worshipping community based on these beliefs should lead to an introduction of the child to that community.

4. The Practical Results of Christian Education

A sense of individual responsibility and worth, a knowledge of the Bible contents and an atmosphere of worship should spring from the religious instruction within the school curriculum.

5. The Influence of Christian Education on the Curriculum

The prevailing naturalism and materialism can be best offset by the integrating effect of Christian teaching over the whole curriculum, which should be taught from an acceptance of that Faith if there is to be a true philosophy of education and life, and not a series of disjointed or mutually opposed studies. Tension in the mind of scholars is set up by opposing viewpoints in the various branches of the curriculum.

6. Christian Education in the Home

Where there is no prospect of such instruction in the home, effective religious instruction in the schools can do something to counterbalance this lack, but the example and ideals of the home can do much in practical education as well as in direct teaching to provide an important part of the complete education of the individual, and can correct deficiencies in the normal curricular teaching of religion.

7. Religious Instruction in the Church

The importance of Sunday school teaching as an essential part of Christian education is stressed, but the responsibility of the churches in a teaching capacity to their people is urged, and the teaching ministry of the churches is needed to provide that distinctively Christian and church-linked teaching which may not be given in the day school. The ultimate value of religious instruction is that it should lead to the life more abundant promised by the Lord Jesus Christ as the result of belief in His person.

The History of Religious Instruction in English Education

The place of Religious Instruction in British education is unique, for in no other country in the world can a similar state of affairs be paralleled. America and the countries of the British Commonwealth of nations all agree that religious education is not part of the duty of the state schools and these have remained completely secular throughout the years. To understand the unique position in Britain some knowledge of the history of our educational system is needed, for the present state of affairs can only be interpreted by a reference to the events of past development in education and its practice.

The Christian influence behind the spread of popular education has been acknowledged in every history of education, and the spread of what is usually known as Evangelical Christianity greatly speeded the demand for popular education. Whitefield and Wesley founded both day and boarding schools, Wesley in particular being impressed and influenced by schools he saw at Jena and Herrnhut. Wherever he went, the great preacher impressed on his followers the need for careful attention to the matter of popular education. The influence of Raikes and the Sunday School movement on the development of British education has been far reaching and cannot be overestimated, whilst the enthusiasm of Hannah More was also contagious. The monitorial schools founded by Joseph Lancaster in 1798 were founded on the Bible as a basis of the whole simple curriculum, although the schools were unsectarian in character.

The debt which the day schools owed to the Sunday school movements was freely acknowledged by Sir J. Kay Shuttleworth in 1867 when he wrote as Secretary to the Committee on Education—the forerunner of the later Board of Education—" The Sunday School was the root from which sprang our system of day schools. . . . When the Government first attempted to organize national education, it not only found this machinery ready to its hand, but it also found that the Churches and the congregations contained within themselves a zeal and purpose as to public education, which existed in no civic body, not even in the Parliament itself."

The story of public education is the story of the struggles of the various interested parties to maintain their position in a field, the importance of which was being gradually realized by all walks of life. The great Education Act of 1870 was a compromise, and a particularly English one at that, in which religion became a voluntary subject, from which a parent could withdraw his child on conscientious or religious grounds. The pattern of British education thereafter followed this pattern of compromise throughout the years until the passing of the Education Act of 1944 set the pattern which is followed in the schools of the country at the present time.

The earlier pattern followed this general scheme: where the school was maintained by the local council, the religious instruction was taken at

the commencement of the morning session in order to facilitate the withdrawal of any pupil whose parents did not wish him to take part in the religious instruction given. The school registers were not closed until after the conclusion of such religious instruction so that no child was penalized for non-attendance before that time. This arrangement necessarily meant that every teacher in council schools was forced to take religious instruction at the start of each day whether he was interested or qualified in the subject or not. The system was bound to present anomalies and meant that every teacher, of whatever religious persuasion or of none, was required to agree to take Scripture for half an hour per day. As this time coincided with the start of the classroom routine for the day, many uninterested teachers utilized the time to collect dinner money, milk money, to attend to class business and to discharge various tasks whilst the religious instruction period suffered. Other teachers, eager and willing to grasp the opportunities provided by such a period, taught the basic facts of the Bible clearly and well.

Between the two wars an increasing recognition of the value of religious education led a number of counties to produce an agreed syllabus for the guidance of their teachers. Cambridgeshire was a pioneer in this direction whilst other education authorities followed suit or directed the attention of their teachers to that produced by Cambridge. These were offered as guides and had no binding character on the religious instruction given in the classroom.

This period coincided with a marked decline in the influence of the churches on the life of the population, and it was natural that an increasing emphasis was placed on the schools as agencies to bring the claims of the religious interpretation of life before the nation's forthcoming citizens. Good was done when the teaching was in the hands of those who recognized the desirability of introducing the spiritual factor into education, but much harm came when the teaching was entrusted to those who were not so convinced, and in some cases positively opposed.

The Act of 1944

In spite of the commencement of the War in 1939, much public interest was aroused when it became known that a revision of the Education Act was contemplated by the Government. All the interested bodies, county councils, churches, private organizations and non-maintained schools were invited to express their views and there was some fear that the earlier denominational controversies would be raised once again. A very large measure of agreement was reached and it is significant that all the administrators agreed that a religious foundation for the public education system was an essential stabilizing factor.

As the Act of 1944 stands it requires that every school shall open with a daily act of worship shared by all the pupils whose parents desire them so to do, and that the teaching of religion is compulsory in all schools. Every teacher and every child, however, is completely free to take no part in either the opening act of worship or the religious instruction, this being a fundamental principle of the act. Schools are divided into these different categories:—

(*a*) Schools entirely provided and maintained by the local education authority.

(*b*) Voluntary schools with buildings provided by religious bodies, but in which the educational costs, including the payment of teachers, are met by the local education authority. The appointment of teachers is within the power of the managers, of whom four out of six are appointed by the religious body.

(*c*) Controlled schools are those where the religious body cannot find half the cost of bringing the building to the standard required by the Ministry and which are therefore taken over by the local authority, who then appoint teachers and operate the " Agreed Syllabus " although the building outside school hours remains at the disposal of the religious body.

(*d*) " Direct Grant " schools are those schools which were independent in their foundation but have been granted financial aid from the Government but not from the local education authority. Such schools have to comply with the Act and observe the general requirements laid down for religious instruction.

(*e*) " Special Agreement " schools are usually denominational secondary schools which receive up to 75 per cent of the building cost from the Government.

The private schools which are run independently are outside this system, but are open to inspection by the Ministry of Education Inspectors and may be closed by law unless they operate efficiently according to the standards of the Act.

Such an Act was hedged about necessarily with safeguards which affected the right of teacher and child to withdraw from this teaching, and the freeing of religious instruction from the first period of the day meant that the subject could from then be placed at any time of the day, and consequently handed to the care of specialists who were genuinely qualified and eager to teach religious instruction to their classes. A further result of the act was that this teaching was now open to inspection by Her Majesty's Inspectors, an event which was impossible under the previous arrangement. The Act laid down at the same time that the clergy could no longer act as unofficial inspectors in state schools and that they could not hold employment as both teachers and clergy, although they may be

invited to conduct school assembly in a non-sectarian capacity. Certain safeguards also exist by which facilities can be claimed for denominational instruction which cannot be arranged outside school time, although the cost of providing such denominational instruction must be borne by the denomination concerned.

The requirements of the Education Act presents a very different picture from that which is experienced in any other state system of education, and although its provisions are largely taken for granted in this country, they are a cause of wondering amazement, and sometimes positive envy on the part of sympathetic observers from overseas. In American schools the teaching of religion is forbidden in all state schools and the Bible is regarded as a " sectarian book ", the distribution of which has been attended by important lawsuits to test the legality of such action. As a consequence many private schools have sprung up in the United States in which more definite Christian instruction can be given in a curriculum which is integrated to Christian ideals. In practice, American educational theory has been hard put to provide a philosophy of education without the binding factor of the Christian faith. There have been many alternative integrating factors, but none has proved sufficiently strong to provide the necessary uniting ideal. Since 1886 in France no monk, nun or priest is allowed to teach in the State schools and religious instruction is not attempted, whilst in many parts of the British Commonwealth the religious instruction is entrusted to voluntary teachers provided by the various religious denominations, an arrangement which militates against the uniting of the school as a true community.

Various Conceptions of the Aims of Education

Various reports on the problems of national education helped the formation of the climate of opinion in which the 1944 Act could be launched, and quotations from some of these give an indication of the attitude to religious instruction on the part of the reporting committees. The Spens Report stated: " No boy can be counted as properly educated unless he has been made aware of the existence of a religious interpretation of life." The Norwood Report averred: " There is a general acceptance of the Christian ethical standard as the highest teaching known to man." The White Paper of 1943 stated: " There has been a very general wish that religious education should be given a more defined place in the schools, springing from a desire to revive the spiritual and personal values in our society and national traditions." Mr. Chuter Ede, on behalf of the Government, could say in parliamentary debate: " There is, I think, a general recognition that even if parents themselves have in the course of life encountered difficulties that have led them into doubts and hesitations, they do desire that their children shall have a grounding in the principles

of the Christian Faith as it ought to be practised in this country " (*Hansard*, 10th March, 1944). The 1944 Act was the interpretation of these views in the life of the schools, so that the Statute Book contained the instruction: " The School day . . . shall begin with collective worship . . . and religious instruction shall be given."

Once the Education Act had been placed on the Statute Book, the local education authorities began to assemble their committees which were to be entrusted with the task of drawing up the agreed syllabus for the local schools. Representatives of the various denominations, of the education authority, and of the teachers met together to formulate a syllabus which should be used in all the local schools. The results varied widely from authority to authority, but the framework which was agreed was sufficient to give a splendid basis for teaching which could be truly Christian, the aims of the syllabus being to provide a Bible-based instruction which should lead to faith in action, whilst at the same time leaving the churches free to continue to supply the worship and fellowship which was not part of the aim of the religious instruction in the day schools.

In the hands of convinced Christians the Agreed Ayllabus can be a weapon of great value in providing an interpretation of life which is founded on spiritual needs rather than on materialistic and utilitarian considerations. The problem of tension in the minds of scholars has to be faced when the student is aware of a number of contradictory attitudes which reveal themselves in the differing approaches of teachers to their subjects. A truly Christian education is only possible when all subjects are taught from Christian standpoints, and where the whole curriculum is permeated by such an influence. Religious education to be truly valuable must have a higher objective than the formation and strengthening of character, for the basis of Christian education is found in the recognition that man is a fallen creature of God, rather than a being capable of struggling by his own unaided efforts to a higher level of existence.

Newman faced the problem squarely as he wrote in his jewelled prose: " Quarry the granite rock with razors or moor the vessel with a thread of silk; then may you hope with such keen and delicate instruments as human knowledge and human reason to contend against these giants, the passion and pride of man." Pascal similarly realized the tremendous need of man when he wrote, " It is in the nature of man to believe and love; if he has not the right objects, he will attach himself to the wrong ones; " whilst the phrase, " There is a need to build a solid core of spiritual life which is able to resist the attrition of everyday life," is equally discerning in its insistence on the need for spiritual foundations.

Religious education will have only a limited value if it is based on what may be termed utilitarian considerations, such as the production of better citizens and more orderly family units. The traditional Classical view of religion as an aid to " decency ", part of the normal equipment of

a gentleman, is sadly lacking in the true spirit of Christian teaching which is worthy of the name of " Religious Instruction ".

The Deeper Requirements of a Christian Education

All religious instruction must start from the cardinal fact that God is the source of all life and that He is supreme in the universe He has created. This is universally maintained by the Agreed Syllabuses of Religious Instruction, but it is by no means a fact which is recognized in the rest of the time-table, and there is a real need for teaching which can help older scholars to achieve an harmony between the various parts of their knowledge to allow for the sovereignty of God.

The Bible is recommended as the major source of all religious instruction, and the Old Testament record should build up the knowledge that the history of the Jewish nation is the record of man's relationship with God, and of God's dealings with men and nations in that relationship. The teaching of the great facts of the Old Testament record will provide an interpretation of history which can be applied to the study of human relations in every age, and which is an essential part of an educated man's equipment in the modern world. A deepening sense of the close relationship possible between God and man will be a direct result of the faithful teaching of the Old Testament syllabus.

The teaching of both Old and New Testaments will force home the lesson in vivid object teaching that man cannot know God by his own unaided efforts. The pride so often engendered by modern achievement and knowledge here receives a useful corrective which is an essential antidote for the exalting ambition of modern man. Bible-inspired teaching will bring home the salutary lesson that " all have sinned and come short of the glory of God ", and each section of the teaching will proclaim this truth to the developing mind of the child.

Wisely taught, the Old Testament will show much of the unfolding of God's redemptive plan for the world. The great sweep of the narrative can be rightly understood only by those who have grasped the underlying harmony of its purpose. The New Testament will then be seen as the completion of the revelation of God's redemptive purpose in the person and work of the Lord Jesus Christ. Frustration and a false picture of the Christian Gospel will follow attempts to uphold Jesus Christ as a great example to be followed: the prior need will be to present His work as the completion of God's redemptive purpose, the culmination of the Old Testament revelation.

The study of the worship of the Old Testament, the growth of the Christian Church in the Acts of the Apostles, and the teaching concerning Christian fellowship and worship in the Epistles is bound to lead to some

discussion on the possibility of entry into the fellowship of a living worshipping community or church. Pupils can be led thus far in the teaching of the Agreed Syllabus, but it is no part of the work of the teacher to take the place of the church in the individual experience, although many syllabuses allow a place for the discussion of differences in Christian practice and worship. As the Bible is taught, the child is presented with the material on which to form a decision concerning joining of such a community.

The Practical Results of Christian Education

Religious Instruction should never be allowed to become just another subject which can be studied in a vacuum unrelated to life and practice, for the practical results of such teaching should result in personalities which have become transformed by the operation of the Holy Spirit in the heart, producing Christian love and ideals impinging on the whole of the child's society. This high ideal is one which is seldom experienced in the classroom, where the fundamental fact of conversion can be taught as a great experience of the Christian life, but can be seldom applied in individual fashion. This individual application is conceived of as the task and responsibility of the church and not of the class teacher, who would indeed be stepping beyond his province in the state schools. Whilst it must be admitted that Christian virtues can be displayed only when there is the prior working of the new life in the individual nature, the wholesome effect of Bible teaching is seen over the whole of the school society. A right sense of values is imparted to each child, and a standard of right and wrong provided which is otherwise often sadly lacking in contemporary life.

The tremendous value which the Bible places on the individual is another direct contribution made by religious instruction to the well-being of the national society. So many things tend to break down the sense of individual responsibility and worth that the Bible emphasis on man's importance in the sight of God is a tremendously potent corrective to the tendency of much present-day thought. People who have never accepted the Christian faith but have been influenced by the doctrine of individual importance and responsibility are more likely to be better citizens than those who have absorbed the idea of man's insignificance in face of the complex world in which he is placed.

The Apostle Paul set high value on a knowledge of the Holy Scriptures from an early age, and the imparting of this knowledge must be the primary value of Religious Instruction in the schools. Where such knowledge has been imparted, the task of the churches is appreciably lightened, for a major obstacle to Christian progress is the present ignorance of the facts of the Christian Faith, which in turn leads to popular misconceptions and oppositions. This foundation of knowledge must introduce the pupil to

the existence of the worshipping community of Christians in local churches and should thereby seek to bridge the gulf which separates the church from the masses of the nation. The corporate act of worship, in which all the school shares, aids in the building up of this conception and, wisely conducted, can act as a valuable adjunct to the fuller worship of the whole community.

This atmosphere of worship should not be restricted to the time of school assembly, but should be allowed to pervade all the teaching of the Bible. One of the major drawbacks attending the teaching of religious instruction in schools is the danger that children will conceive of Scripture as just another subject which can be studied in the same spirit as any other title in the curriculum. The value of such study is probably negative and constitutes a positive hindrance to the growth of the spiritual life. Where the teaching of the Bible is reverently and clearly given, such knowledge will broaden and deepen the mind as well as open the eyes of the spiritual nature of the child.

The Influence of Christian Education on the General Curriculum

An education which is truly Christian as opposed to an education which carefully segregates religious education to one unimportant corner of the timetable will acknowledge the tremendous effect of the Christian philosophy on the whole of the curriculum. A truly Christian education will demand teachers who are convinced Christians as well as competent historians or scientists. An education which is given by a historian who is a dialectical Marxist, a materialist science teacher, a Christian English master and a literary-minded Religious Instruction teacher is likely to set up a state of tension in the mind of the subject of such instruction so that little positive good will result. The need is not only for more teachers of Religious Instruction, but for more Christian teachers in all subjects.

The many philosophies which are adopted by writers on education are an indication of the need for an integrating factor in educational practice which has not been found in any alternative to the Christian Faith. A demand has been made that education should seek to " teach them how to admire ", to use Jowett's phrase when writing to Arnold. Education for leisure has been given as a watchword which will recognize the increasing mechanization of much of our working day, and Christian education will endorse the need for training in the purposeful use of leisure when it considers the mass entertainment which provides for the free time of the citizens of the nation. A Christian view of the liberal arts is needed in the teaching so that a standard of values can be constructed which will guide the individual in his choice of reading, in his assessment of merit and achievement in these fields. A. N. Whitehead's statement that " moral

education is impossible apart from the habitual vision of greatness " (*Aims of Education*) agrees with Matthew Arnold's ideal of setting before youth " the best that has been thought and said in the world ". Christian education will not only place before the child the vision of greatness which constitutes the best strivings of Greece and Rome, of ancient and modern civilizations, but it will provide a yard-stick by which the child may measure this achievement in the light of what Paul termed the " foolishness of preaching ", as the contrast is drawn between the wisdom of the world and the foolishness of the Cross.

Because the Bible is the book with the broadest appeal and the readiest approachability of any great body of literature, its message and its subjects are more easily teachable than the more remote great literature which is secular in origin. This gives an initial advantage to the teacher of religion in the school and provides a standard by which all literature can be judged. An habitual vision of greatness is permanently valuable when it is compared with the sight of true greatness revealed in the record of the New Testament. The records of the Old Testament never seek to ennoble the characters but present them as failing men and women in dire need of the grace and power of God. A typical Classical education, with its frequent reference to the nobleness of the characters encountered, needs to be given the corrective of the Christian assessment of Greek and Roman life as revealed in the Acts of the Apostles and the Epistles of Paul.

The greatest alternative to the Christian philosophy of education is the prevailing naturalism on which Walter Lippmann commented in 1941: " Day after day young people are subjected to the bombardment of naturalism with all its animosity to Christianity. In the formative years of their lives, or at least during the period of their education when their ideas are crystallizing, they must listen and absorb these ideas of man, the world and religion. With these facts before them, why do Protestants wonder that Christianity has so little influence over young people? " (*The American Scholar*—" Education versus Western Civilization "). This comment was prompted by the American educational scene but it has a relevance beyond its national boundaries.

The tension aroused in the minds of scholars is most obvious in the field of science and it is here that most controversy is aroused. This obscures the importance of the tension created in other subjects which can prove as damaging as the more spectacular and publicized debates concerning science and religion. The ultimate attitude is summarized by Dr. Julian Huxley in these words: " The advance of natural science, logic and psychology has brought us to a stage at which God is no longer a useful hypothesis . . . a faint trace of God still broods over the world like the smile of a cosmic Cheshire cat. But the growth of psychological knowledge will rub even that from the universe " (quoted from H. Lowry, *The Mind's Adventure*, 1950). The same approach is revealed in the quotations from

a recent discussion on the meaning of evolution: " Man is the result of a purposeless and materialistic process that did not have him in mind. He was not planned. . . . The discovery that the universe apart from man lacks any purpose has the inevitable corollary that the universe cannot provide any universal, eternal or absolute ethical criteria of right and wrong " (Simpson, *The Meaning of Evolution*, O.U.P., 1950).

The impact of such a philosophy is bound to create tension in the mind of the scholar which cannot be ignored by responsible educators, although the final onus for a resolution of such tension will rest with the child being called upon to make a decision during the formative years. It is the duty of religious education to provide the materials for the formation of such a decision based on adequate materials of knowledge. Religious Instruction is bound to face the problem presented by the overlapping boundaries of religion and science, and to give some guidance to the older scholar in these matters. The opposition is not between religion and science but between religion and the complete materialism represented by the quotations cited.

The complex nature of modern society necessitates an attention on the part of teachers, so that the curriculum will prepare the pupil for his status as a citizen and worker in this society. Social studies are replacing in some schools the traditional divisions into history, geography and civics, and a truly Christian education would ensure that these are not conducted as matters which do not allow of a spiritual interpretations. The message of the Christian Gospel that " man shall not live by bread alone, but by every word that proceedeth out of the mouth of God " is an essential corrective in this branch of learning, and one which is being increasingly recognized wherever a completely materialistic philosophy does not hold sway. The Christian interpretation of history has received notable reinforcements in recent years by the writings of Professor Butterfield, but many schools are still pervaded in their history teaching by the mechanistic theories and rigid utilitarianism of earlier thought.

Christian Education in the Home

Whilst this examination of the place of religious instruction in education has been concerned largely with the organized education of the school, it must be remembered that the most influential educational factor can be the home. The influence of the home has waned considerably in recent years, but the worst of homes can often counterbalance the best of educations in institution and school. In the best conditions, the home can often provide the answer to the sense of tension which is created by the lack of a unifying life-principle in the child's school. Effective learning arises out of a genuine need or desire, and the love and security found in a good home provide an excellent foundation on which to build the religious in-

struction and the spiritual life of the individual. Whilst the child is bound to pass through a stage of revolt as he struggles towards independence of the early home boundaries, he can also turn to the ideals and the aims of the home in spiritual life as a check against the varying standards presented by the school community in which he works.

In a Christian home the basic values of religious education are seen in action and the child can assess in an immature fashion, but quite clearly, the importance of such values in the conduct of everyday life. It has often been said that " religion is caught, and not taught "; but whilst this statement needs careful modification, it is true that the fundamentals of the spiritual life are more likely to be caught in the home than in the many-standard life of the school community, with its presentation of mutually contradictory life philosophies. " The religion of a child depends on what its father and mother are and not on what they say. . . . The child sees what we are behind what we wish to be," wrote Amiel in the *Journal Intime*.

Whilst religious instruction in the schools can help to offset the lack of stability in some homes and the absence of worthy ideals for life, the Christian home can do much to illustrate and empower the teaching of the schools where this is in accord with the Christian philosophy of life; whilst, where the school teaching provides materialistic standards only, the home can apply the necessary antidote. Many well-meaning parents tend to excuse their neglect of home religious instruction by saying that the personality of the child must be respected and that he must choose for himself when he reaches years of discretion. The religion of the " open mind " is largely applied in the fields of education, and is often used in relation to the home training in spiritual realities. There is no doubt that the child will " choose for himself; " in fact it is one of the laws of the spiritual life that the choice rests with the individual; but if the parents refuse to give him the facts for making such a choice in the matter of religion, they are in effect deciding him in favour of a materialistic conception, for the law of the spiritual world states: " The natural man does not understand the spiritual." The following words are worthy of consideration: " The parent whose attitude is ' let him decide for himself ' will find that when the child has grown up no decision remains to be made, for the reason that it has already been made. This is only logical. Most influences outside the home are secular. Therefore the boy or girl who is given nothing religious in home, church or school is under a constant exposure to irreligion. For the world is not neutral. It takes a stand, and its stand is against Christianity " (F. E. Gaebelein, *Christian Education in a Democracy*, O.U.P.). This quotation envisages the American educational scene where the state school has no concern with religious instruction, but its insistence on religious training in the home is relevant to Britain to-day.

Religious Instruction in the Church

In the historical section of our survey we have noted the great interest which the Christian church has always taken in the education of the people. There is a tendency in some quarters to minimize the present importance of the place of the churches in the religious training of the people. When all education tends to become more completely secularized than ever before, there is a great place for the educative work of the churches, for a teaching ministry is essential if the masses are to understand the basic facts of the Christian faith. The Sunday School movement still gains constant support from most branches of the Protestant church, and the importance of this side of its work increases as control over the daily educational practices and provisions is lessened. The Roman church is alone in this country in its single-minded insistence on the essentially religious character of all education and its desire to provide Roman Catholic day schools, for the Church of England finds sufficient difficulty in maintaining the day schools already in its control, whilst the Non-conformist bodies have abandoned any widespread attempt to provide a national system of education for their members.

This situation increases the importance of Sunday School teaching, where more distinctive instruction linked with the worship of the community can be given in premises linked in the child mind with the church-going of adults. The Sunday School curriculum, whilst essentially Bible-based, should not be a pale reflection of day school teaching, often given in less cramped surroundings, but should seek to bring an essentially Christian note into the teaching, whilst linking the great truths of the Christian Faith with the distinctive practices of the church life. Sunday School instruction to-day too often errs in confining itself to simple Bible stories and neglecting to teach the great truths which are less likely to be studied in the day school curriculum. The Roman church introduces children to the great themes of its worship at an early age, and Protestants would make a distinctive contribution to religious instruction if there was a greater emphasis in their teaching on the distinctive doctrines of the Reformed Faith.

The difficulty of staffing voluntary works such as Sunday Schools brings into relief the great responsibility of ministers of religion in this connection. Men and women who are trained in the great truths of religion should not delegate the whole of this most important part of their work to those who are, through no fault of their own, not thoroughly equipped to undertake the task. There is a responsibility on the part of church leaders to ensure that children are receiving in their formative years an adequate presentation of the Christian Faith from those competent to undertake the task. The State Schools cannot be blamed for not doing what is not within their province, whilst sometimes the churches are content to limit their field of operations to one brief hour in an overcrowded Sunday

School where instruction is given by those who are often inadequately prepared for such responsible work. The value of such religious instruction would be widespread in every part of the educational field, for young men and women would go to their work, or to their further educational studies, with a solid foundational grip of Bible doctrine and Christian truths. When the churches picture themselves as part of the complex organism which caters for the education of the whole man in the twentieth century, and make arrangements to implement this conception, a great and positive move will have been made towards the arrest of the secularization which is such a menace in present day society.

Conclusion

It will be seen from the foregoing argument that the place of religious instruction in education is vital in any truly comprehensible scheme, whilst it affords a basis on which the development of the spiritual life can take place. The scope of the work possible in the schools is wide, but is necessarily limited by the intentions of the Act of 1944, so that the work must be continued in the home, by illustration and example as well as by direct teaching, and in the church, where the instruction can be linked to the great and distinctive doctrines of the Christian Faith in the setting of the worshipping community represented by the local church. The secularization of present-day knowledge can be arrested only by a sufficient emphasis on the spiritual factors of man's existence, the Christian Faith providing the only true alternative to a complete materialism or naturalism which can give no constructive philosophy of life, and which must perforce neglect whole tracts of experience and responsibility in its approach to the problems which will beset the developing personality. The statement of the Lord Jesus Christ that " I am come that they might have life in more abundant measure ", is the ideal of an education which is truly Christian and which gives full weight to the teaching of that Faith in its educational scheme.

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THE CAXTON HALL

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THE BIBLE AND CURRENT THEORIES ABOUT LANGUAGE

By

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SYNOPSIS

Many widely-held views on the Bible involve an approach to linguistic study that is no longer acceptable. This paper examines the bearing of certain new facts and inferences on Biblical questions. In respect to the origins of language, the evidence now available does not support the hypothesis that as man developed from earlier stages so his language has evolved from simpler to more complex types. Similarly it is not possible to explain the many varieties of language types now known to exist on the basis of a supposed ancestor language. The Biblical teaching on both of these points is therefore not inconsistent with the facts. Advances in the technique of linguistic study show that former ideas of correctness in grammar and of the simple nature of written records are untenable, in consequence of which some views about the substance of the Bible may also be untenable. Similarly a better understanding of what is involved in determining the meaning of a given utterance and the relation of this to the intention of the speaker or writer throws light on some questions connected with the translation of the Bible. The principal purpose of language appears to be self-expression rather than merely communication or thought, and this provides a significant link between man and God.

There can be few subjects receiving scholarly attention today that have more direct relevance to questions connected with the Bible than the study of language. Nevertheless there do not seem to have been many attempts to examine the results of recent developments in this linguistic field which may bear on this Book that claims to be the Word of God expressed in the language of men. It is my intention in the course of this paper to outline a few of the ways in which the advance in the study of language in the past few years might be of interest to those who approach the Bible thoughtfully.

Although for the sake of brevity I have used the term " theories " in the title, I should perhaps make it clear at the outset that what I am mainly concerned with are certain facts that have emerged from recent investigations, together with some fresh inferences about a number of aspects of language that have now gained acceptance. One reason that gives a measure of justification to my intention is that many of the advances in this realm we are considering are not widely known, one reason

for this being that much of the progress is directly due to investigations into some of the less well known language fields, such as the one in which I am myself engaged.

One of the first difficulties encountered in any study that sets out to show how language impinges on other subjects, is that since everyone speaks at least one language, namely his mother tongue, most people are inclined to take for granted that they are aware of the basic characteristics of language. In fact however, the discipline of language study is becoming more and more specialized, and it will be increasingly difficult for those who have no intimate experience in this field to handle borderline subjects that involve the application of linguistic principles.

That there is a close relationship between language and certain other subjects, such as philosophy and psychology, has long been recognized, and indeed many who are very competent in these disciplines find it necessary to deal at length with things that fall properly within the field of language study. In the realm of theology and Biblical investigation however, there is probably less awareness of the importance of linguistic studies of a more general kind, as distinct from literary investigation using traditional grammatical methods. Nevertheless, as I shall endeavour to show, there is probably no realm where any change in our knowledge of linguistic matters could be more significant.

It frequently may not be realized that behind much of the orthodox approach to the Bible are linguistic theories that are ultimately based on what might be termed Aristotelian views of language, although it has been held by some scholars that the traditional basis of language study was founded on a misapplication of Aristotle's teachings. Nevertheless, with the more recent insistence on an empirical method in linguistic investigation, not a few new facts, together with a number of interesting theories, have introduced important modifications into the earlier assumptions, and some of these are relevant to our attitude to the Bible. We shall therefore need to ask whether new knowledge of this kind necessitates any radical change in our ideas about the nature of the Bible, or makes it difficult for thinking people to believe in the Book. On the other hand we shall have to inquire whether the developments to which I have referred may not actually help us to understand the Bible better, and in certain cases throw light on difficulties.

The types of question I propose to deal with in this paper fall into three main groups, which I shall term, (1) the origins of language, (2) the nature of language, (3) the function of language.

I. The Origins of Language

Under this heading there are two main topics that have always aroused interest. On the one hand we are confronted with the fact that the faculty of speech is found among all peoples, and that it is confined to the

human race. On the other there is the extraordinary diversity of languages through which the faculty of speech is exercised. On this latter point we have much more information than was available formerly. As an illustration I might refer to the fact that over 700 different languages belonging to many apparently distinct families are known to be spoken in Africa alone.

Now on each of these two points the Bible either states or suggests an explanation, since it seems to be implied that man was created with the power of speech, while it is definitely recorded that some at least of the diversity of languages was originally due to the direct intervention of God. We must therefore examine what is known or can reasonably be inferred about these two questions.

(1) *The Origin of the Faculty of Speech*

Until recently most theories about the way man acquired the power of speech were based in a special theory relating to the characteristics of what are termed " primitive " peoples. Briefly the argument runs something like this: the simpler the way of life of a people the simpler their language; if therefore the history of man is traced back far enough, life is found to become more and more crude, and in the same way language becomes simpler and simpler until it is ultimately a series of grunts. In reverse this theory has been integrated into the hypothesis of the organic evolution of the human race, and it has been supposed that as man evolved from some earlier phase of development, so at some point he gradually acquired the power of speech, and that his language, at first formless, slowly became more and more complicated until it reached the majesty of the classical languages.

Since this theory was formulated, much more attention has been given to the study of the languages of peoples with a relatively simple way of life. As a result we now know that the basic hypothesis is specious, since in very many cases their languages are richer and more complex than those of the so-called civilized races. Moreover, the whole idea of primitiveness in language arises from a failure to recognize that there are many different ways in which the relative simplicity of languages can be assessed. It might be with respect to pronunciation, to grammar, to vocabulary or to ease of expression. It is significant in any case that all the evidence points to the operation of a principle of periodic entropy in most aspects of the developments of languages. In other words there is at any given point a tendency to the levelling out of distinction; nevertheless, owing to the facility with which linguistic units fuse together, new and more complicated units seem continually to arise out of the debris of earlier ones. As however this important fact is one that can be illustrated only

by a large number of detailed examples, I propose rather to consider the different ways in which the supposed simplicity of languages can be detected.

When the pronunciation of languages is investigated, the facts show that relative simplicity is not a useful device for comparing them. As an example we may take first some of the varieties of present-day English and then refer to some of the languages spoken in the African bush. It will presumably be conceded that English should not be regarded as a " primitive " language, yet in the pronunciation of standard English there are few sounds that are not simple. Nevertheless in current speech there are groups of sounds so complex that few foreigners are able to master them, as for example in the usual pronunciation of " Marylebone ", which consists of a vowel preceded by one consonant and followed by four others, r, l, b, and n in a tight cluster. In the field of African languages there is a comparable situation, and side by side may be found some languages with an extremely simple range of sounds and others where the pronunciation is so complex that a dozen or more extra letters may be required to write them. On this level then there is no evidence of any connection between the degree of development in the way of life of a people and the complication of the pronunciation of their language.

With respect to grammatical structure also, languages with what might be termed a simple system are by no means confined to any one type. Among those with relatively simple grammatical processes are to be found English, Chinese and some of the languages of West Africa, while in Central Africa are many whose grammar is extremely complex. In fact the majority of the languages spoken by people with simple ways of life appear to display an unusual degree of complexity in their structure. It is therefore impossible to base any arguments on the supposed simplicity of the languages of primitive peoples, since the facts are that many of these languages are grammatically anything but simple.

In referring to the size of vocabularies also many false assumptions have been made. It is now known that on the average the vocabularies of pre-literate peoples are much larger than those found for example in most European languages. Indeed one of the difficulties encountered in the study of most African languages is the vastness of their vocabularies and the extreme precision with which most of the words are used.

The three aspects of pronunciation, grammar and vocabulary are the only ones where it is proper to attempt to assess the relative simplicity of languages, but reference must be made in passing to ease of expression. It is probably in respect to this feature of the use of language that many of the ideas about simplicity and complexity have arisen. Naturally it is impossible to express in the language of pre-literates facts such as those dealt with in much scientific description, but then it is also extremely difficult to do so in a highly literate language like Arabic. Similarly a

discussion of some abstruse point of contemporary philosophy would be impracticable in the language of most of the peoples of Africa, but then, strange though it may appear, it is scarcely less so in modern Chinese. What is in question here is not the nature of the language being considered, but rather its use in expressing the thoughts of the people, so it is inevitable that only where there are large areas of thought commonly involved in the thinking of the speakers of a given language are adequate means of expressing them developed. The presence or absence of such means is therefore no measure of the complexity of the language as such.

From the various facts just referred to it is clear that there is no evidence pointing to the supposed evolution of language from some original collection of noises. Put quite simply, there is nothing in the known facts about the probable origins of language to show that man was not created with the faculty of speech.

(2) *The Diversity of Language*

The other main line of investigation starts from the fact that there are many different language groups and families in the world, and some explanation is needed to account for this diversity. Here also earlier theories, some of which are still widely held, are based on premisses that are now known not to be fully valid. It has frequently been assumed that by searching through enough languages, some idea may be gained of certain aspects of the original human speech, and that it is then possible to trace the development of these down through the ages. One example of this is the conclusion that has been drawn from the fact that the word for " mother " in many very different types of language is something like " ma ". It is therefore asserted that this proves that the word for " mother " in the first human language must have been " ma ", and that the corresponding word in most languages is descended from it. This is however almost certainly a specious argument, since infants of each generation produce the so-called word ready-made as one of their earliest articulations, and consequently it is impossible to show that this similarity is any indication of a common origin. Nevertheless, certain facts are known about the probable derivation of some of the language families found to exist, and these are relevant to our present purpose.

When any particular group of languages that shows signs of some kind of relationship in prehistory is investigated, two things usually emerge. On the one hand it is rarely, if ever, possible to infer that any of the large groups had its origin in a single ancestor language. On the contrary the evidence in most cases points to a complicated ancestry. On the other hand, even if one takes the whole of the probable sources that have to be postulated to account for the group, there is usually a large residuum

throughout the group for which it is not possible to postulate any origin at all. The net result of this is that, even in a relatively restricted language field, the genealogical concept, however attractive it may be in principle, is not completely applicable.

When all the main types of language are taken into account, the situation is naturally more complicated. In reality, however, it is not possible to achieve even the smallest degree of integration; thus, for example, there is no indication of any relationship whatever between the languages of Western Europe and Chinese on the one hand and the Bantu languages on the other. We are left then with a number of disparate language families, most of which display among themselves a complicated state of affairs with respect to their probable ancestry.

In the light of these facts there is nothing that makes it difficult to accept the Biblical statement that at the Tower of Babel diversity was introduced into human language by the direct fiat of God.

II. The Nature of Language

There are several questions that arise in connection with the nature of language in which the traditional view has been modified in recent times. It is no longer adequate to discuss language in general, or even any language in particular, within the framework of ideas used to instruct children in school. Although this may seem a superfluous remark in a paper such as this, nevertheless it remains true that many false theories about the nature of language arise from the fact that the teacher before a class must be able to speak with finality, and therefore it is assumed that in doing so he is in fact serving as the mouthpiece of an established authority. This whole matter of precision in language is one that has begun to receive attention from scholars, and a few points have emerged that may usefully be noted here.

(1) *Correctness in Language*

It is a cardinal doctrine in most earlier views of language that for each particular utterance there is of necessity a correct way of expressing it, and that any deviation from this is an error. Put quite crudely, there is a widespread belief that it is possible to apply the standard of "good or bad" to the grammatical constructions used in any given case. Now in fact this is a purely didactic attitude, and in no sense reflects the actual state of affairs. It is now recognized that language is essentially a social activity in which personal idiosyncrasy is allowed up to a certain point. This was of course always recognized to some degree, and the difficulty was resolved by creating the special category of "style", which was outside grammar as such.

The study of languages beyond the orbit of the classics or the principal languages of Europe has revealed that this division of linguistic behaviour into grammar and style is purely artificial. The only valid criterion that may be applied to any particular specimen of a language it whether or not it is acceptable to the speakers of a language. In other words " right " and " wrong " are really inapplicable to linguistic matters, except in a strictly social sense. When therefore a text is being examined in any language, it is meaningless to describe something in it as " incorrect ", unless there is clear evidence that the particular deviation from the usual form is one that no users of the language in question would tolerate.

The relevance of this to certain problems connected with the language of Biblical writers is something that I shall not pursue. It is, however, clear that unless there is some means of knowing what their contemporaries did or did not regard as acceptable, then it is not possible to invoke the principle of " correct grammar " in making inferences.

(2) *Spoken and Written Language*

It is a commonplace that there are certain problems connected with the relationship between something said and the way that same thing is written. The true nature of these problems has, however, only been brought into focus as scholars have undertaken the study of pre-literate languages. Those who deal with early manuscripts in which no punctuation is used are only too conscious of the difficulty to be overcome in establishing with certainty the identity of some passages. In fact the introduction of punctuation marks was one of the earliest attempts to bridge the gap between the spoken and the written word.

For most of us spoken and written language are two distinct things, and there are phrases and constructions that we readily use in speech but would be uneasy about using when we write. This very fact has induced in many people an attitude to all written language that frequently is founded on misapprehensions. It is now recognized that it is only in those cases where there is a formalized literary convention that it is possible to handle documentary material with any certainty. If there are, as for example in English, ways of writing things that do not normally occur in current speech, this in part at least has arisen from the fact that written language is always more liable to misunderstanding than spoken language. In reality it is a small part only of the total content of an utterance that can be recorded in the normal methods of writing languages. When real precision is required, the devices used are so involved as to necessitate detailed explanation before the transcription can be read, and even then there may still be some aspects of the utterance that have been overlooked. If therefore the only record of some passage available is a written one, it is necessary to know whether it consists of a literary composition

or is a transcript of an utterance. If it is the former there is less likely to be a danger of misinterpretation, since the writer would have had at his disposal various literary devices to obviate uncertainty. If it is the latter then serious problems may arise, and we need to ask a number of questions. Did the speaker give some emphasis to any particular word? Did he speak with the normal inflection of the voice? Was there anything in his facial expression or gestures to indicate that a special significance was to be attached to some part of what he said? These are but a few of the things that remain unanswered when all that is available is a transcript.

In certain parts of the Bible it is evident that problems of this kind must arise, in particular in the teachings of Jesus, since these all consisted of spoken language in the first instance. Is it possible then to recapture something of the lost features, and to bring to life the recorded words? Regretfully it has to be admitted that this cannot be done by any known process, but that the wise student of the Gospels will have to remember continually that what he has is but a shadow of the living words the Saviour uttered.

(3) *Meaning and Language*

A very important realm in which we have come to have a new appreciation of the nature of language is that concerned with meaning. It would be impossible in a paper such as this even to outline the different theories of meaning that have been put forward in recent times. Nevertheless certain broad principles have emerged, and some of these are of interest to students of the Bible.

One of the most significant things that is now recognized is that there is no such thing as " the meaning " of any given specimen of a language, as for example a simple statement. The appropriate question when considering a particular sentence is not, " What *does* it mean ? " but " What *can* it mean ? " Very briefly meaning may be described as the result of the interaction between a given linguistic utterance and the situation in which it occurs. In other words, unless the full context of an utterance is known, a mere understanding of the words and the grammatical constructions it contains may be insufficient to determine its meaning. This principle has of course been implicity recognized in much Biblical study, where endeavour is normally made to determine the circumstances in which things were said in order the better to understand the words. There is however one interesting result that follows from the application of this principle to the Scriptures as read today. If they are indeed the timeless Word of God, then it may well be that words which had one meaning in the situation where they were first spoken, may have another meaning within the different situation obtaining for those who read the words now.

There is a further complication that confronts those who are attempting to determine the meaning of a given passage in some language. This is due to the fact that one cannot safely equate the apparent meaning of an utterance or written passage with its intention. Even where the context of a statement is fully known, and its content is also adequately assessed, it by no means follows that the intention of the speaker, which we may term the import of the statement, is understood. The clearest evidence of this is seen in the occurrence of ambiguity, and in the use to which this may be put when a message is sent in such a way that it deceives those who pass it on but conveys its true import to the one who receives it. This then raises the question of the means to be used in determining the import of any passage where the person who used the words is not known personally to the one who considers them. In the case of the Scriptures this is particularly important, since the Bible claims to have a dual authorship. On the one hand there are the people who spoke the recorded words, or who composed the written passage, and on the other there is the Spirit of God who was speaking through them. In passing it is interesting to note that although we have no personal knowledge of the human speaker, we may nevertheless have of the Divine. In any case however, it by no means follows that the import of any given passage was the same for the writer as for the One who was inspiring him. In fact such a state of affairs seems to arise in many of the prophetic utterances, and it is interesting that it is linguistically unexceptionable to describe any given prophecy as having a dual import, provided that the dual nature of the origin of the words is accepted.

In one further respect the relationship between meaning and import is of importance for the Bible. Few people have access to the Scriptures without the intervention of some kind of translation. What then happens when a translation of part of the Bible is made? Do the words of the version reproduce the meaning of the original? If so, how can this be done seeing that the situation within which the words were spoken or written has little or no counterpart today? Moreover it has become clear to those engaged in the study of languages of different types from the European that the whole concept of literal translation is a figment. It is of course possible to produce something that might be regarded as a faithful translation, but then it cannot possibly be within the pattern of the accepted forms of the language in question, and in addition is almost certain not to be capable of conveying adequately either the meaning or the import of the original. In other words there is an unresolvable dilemma which is amply illustrated in the two main kinds of English translation available today. In the one, regard is had to the words of the original language, and every endeavour is made to follow them, as for example by rendering as far as possible various turns of phrase by an identical one in English. In the other, there is no attempt at " literalness ", but especial

care is taken to reproduce meticulously as much of the import of the original as can be ascertained. To the former category belong the Authorized Version and others based on it, while for the New Testament a good example of the second type is Weymouth's translation. From what has been said it will be evident that there can be no question of comparing the relative merits of the two kinds of version, since they are not alternatives but rather complementary to one another.

III. The Function of Language

Since language is the principle vehicle for the impartation of divine revelation in the Bible, there are one or two points of interest to students of the Bible under this heading. When the purpose of language is being considered, it is clear that it is put to many uses about which it would be unsafe to assume that they fall strictly within its true function. For example, most false statements are made in linguistic form, but this does not justify the inference that the telling of lies is one of the purposes of language. What then have recent studies to tell us about this question? For our present purpose it is probably of the greatest value to inquire whether there is anything that can be achieved exclusively by means of language, and that therefore merits the title of its primary function. This is not to suggest that other secondary purposes may not also exist, but if there is some function that belongs to language alone, then that will in a special sense call for our attention.

For many people the main function of language is regarded as being that of communication. This however can scarcely be the primary purpose of the faculty of speech, since in fact communication without language is a universal characteristic of human relationships. It would be possible to say of course that language makes possible a greater diversity of communication than any other means readily available to men, but even then the most that can be claimed is that it provides an increased facility for the transfer of information.

Another important use to which language is put is in the framing of thoughts, and indeed it has sometimes been inferred that we think because we can speak. Nevertheless it would be equally reasonable to reverse the proposition and say that we speak because we can think. It is possible to have thought without words, and indeed many problems can be solved by reflections that consist almost exclusively of mental images. On the other hand while it is patently true that we can speak without thinking, it is equally true that we cannot speak unless we have the power of thought. In other words, something that sounds like speech is not acknowledged as having linguistic value unless there is responsible for it a person who is capable of thought. Here too therefore while it may be

admitted that a very important use to which the faculty of speech is put is in the framing of thoughts, this is not something that is exclusively the function of language.

There is however one thing that cannot be achieved, as far as we know, without the use of language, and that is self-expression. As evidence for this reference may be made to the tremendous handicap from which all those suffer who have had the misfortune to be deprived of the power to use language. It is indeed arguable that without the faculty of speech there would be nothing detectable to distinguish man from some of the higher animals. There may of course be possibilities of a different kind of self-expression without the use of language, but we have to confess that we cannot conceive of any other means by which personality can be expressed except by using the faculty of language.

The Bible presents the facts about man's creation in such a way that it is clear that language was one of the faculties that was provided from the outset. In His first recorded contact with man God spoke to him, and one of the initial activities of the newly-created man was to use his faculty of speech to give names to the animals and birds. Here then is one thing that man has in common with God, the faculty of expressing himself and of receiving the self-expression of another through the medium of language. Is this in part at least what was involved in the fact that God created man in His own image? Clearly it is the one thing that plainly marks the human race as distinct from all lower orders of creation. The fact that the distortion of the human personality by its rebellion against God has entailed a prostitution of the faculty of self-expression in no way renders it unlikely that this very faculty may be included in the stamp of the divine in human nature. On the contrary it is clear that the redeemed personality expressed in the use of language whose potentialities have been enriched by the idioms of eternity is one of the most potent evidences of the image of God in man re-created. Moreover in the imagery of the Bible, when glimpses are given of the activity characteristic of the Eternal Presence, it is significant that the use of language finds an important place, and that it is speech rather than silence that figures among the ways in which those who see Him face to face present their adorations.

Conclusions

From whatever angle recent developments in the study of language are regarded they produce nothing that presents any difficulty for those who accept the Bible as the very Word of God. On the contrary, contemporary linguistic knowledge serves to throw some light on a number of aspects of Biblical study.

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AT

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WESTMINSTER, S.W. 1

ON

MONDAY, 12th APRIL, 1954

J. H. PATERSON, M.A. in the Chair

THE GEOGRAPHICAL BACKGROUND IN OLD TESTAMENT EXEGESIS

By

J. M. HOUSTON, M.A., B.Sc., D.Phil.

THE VICTORIA INSTITUTE
22 DINGWALL ROAD, CROYDON, SURREY

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SYNOPSIS

The geography of the Old Testament is portrayed as accurately as its history. The development of topography, cartographic surveys and archaeology now provides a clearer understanding of the geographical background. The allusions to climate in the Old Testament demonstrate the stability of ecological controls, so that the geography of the present helps to illuminate the conditions of the past. However, the moral issues resulting within the context of the environment are the most significant. The Hebrew views on Nature help to elucidate many of the references to the physical phenomena.

Much has been written on the progress of archaeological research in the Near East, and its vindication of the Biblical narrative. Less notice has, however, been paid in recent years to the contribution which geographical synthesis can provide to Biblical exegesis. The nineteenth century was a period of intensive exploration and survey in Palestine. Once the surface features had become known it was then recognized that below that surface, now accurately surveyed and mapped, there remained a buried past to dig and unearth from scattered sites. We have now reached a third stage, however, when a closer synthesis of archaeological discoveries and geographical research is required to uncover the buried landscapes and their past societies. There still remains " much land to possess " in this new field of work. The aim of this paper is simply to trace the development of thought concerning Palestine and to consider what aspects of the geographical background are illuminating to Old Testament exegesis.

The Bible is consistently reasonable with the geographical background. Throughout its pages, there breathes the *genius loci* which can be recognized in all the physical elements of climate and landscape, and of the traditional modes of life and customs, so long a part of the environment of Palestine. At the same time the Bible does not profess to be a textbook of geography and such study of its environment can only provide an indirect contribution to its exposition. A knowledge of the geographical features may illuminate revelation but it cannot interpret independently. There is, however, a tendency amongst some Christians to assume that all is known about Scripture and that it is presumptive to expect more to

be discovered. To guard against such tendencies, the findings of archaeology and geography can together greatly enrich the setting of the Biblical narrative without impairing its authority in any way. The contention can be made that in conservative Biblical exposition the levels of observations in such works as John Kitto's *Palestine* (1841–66) and W. M. Thomson's *The Land and the Book* (1859) are frequently still the basic geographical sources. Even an authoritative work like G. A. Smith's *An Historical Geography of the Holy Land* (1894), which ran into twenty-five editions, is no longer up to date, so rapidly has the youthful subject of academic geography progressed. Nearly all the attempts at geographical interpretation have been made by specialists coming from other fields and the majority of cartographic and physiographic work done before 1918 had primarily an archaeological purpose. It is desirable therefore to review the development of geographical research in Palestine and appraise its value to Biblical study.

In the seventeenth and eighteenth centuries a number of explorations were made by European travellers and scholars in Palestine but none could be called "scientific" in a modern sense. The first scientific exploration of Palestine was that of Dr. Edward Robinson in 1838. This American theologian realized that most of his problems were "relating to the geography of the Bible, and intimately connected with its interpretation, and I remember too, that they had never been discussed by anyone who had himself visited the Holy Land."[1] In two intensive tours lasting only seven months in all, he laid the foundations of modern critical knowledge concerning the country. Kiepert prepared a creditable map for him, from Robinson's route-traverses, but his main geographical interest lay elsewhere. "One branch of these historical investigations which I cannot but consider as important for the future geographer and traveller presents a field comparatively untrodden. I refer to the mass of topographical tradition, long since fastened upon the Holy Land by foreign ecclesiastics and monks, in distinction from the ordinary tradition or preservation of ancient names among the native population."[2] Until Robinson's work, the only source of topography even vaguely reliable was H. Reland's *Palästina* (1714). The distinctive value of Robinson's investigations was that he worked critically and independently of the monastic centres from which previous travellers had journeyed and had, in varying degrees of credulity, accepted the traditional identification of sites. There are some 622 place-names recorded in the Bible, of which Robinson identified 177; few of these have been subsequently altered.[3] By 1871 about 262 place-names had been located, and by the termination

[1] E. Robinson, *Biblical Researches in Palestine* (London, 1867, 3rd edit.), p. viii.
[2] *Ibid.*, p. ix.
[3] E. Robinson, *Later Biblical Researches* (London, 1856).

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Page 64, line 5, "of those" *should read* "to those."

of the Palestine Exploration Fund Survey in 1877 a further 172 names had been added.[1] Conder, in particular, added to place-name identification with some 147 new ones, bringing the total to 469 in 1889.[2] The mania to identify Biblical place-names was pushed too quickly however, and it remained the task of later scholars to reduce the number of those actually proven. A number of these place-names are still in dispute. Few writers contributed original methods which Robinson had not already demonstrated, except for the brilliant work of the French scholar Charles Clermont-Ganneau, who fruitfully combined historical, philological and archaeological researches, during the 1880's and 1890's.

A second requirement for geographical accuracy was a good map. In the period 1838–71, that is from Robinson's first journey to the commencement of the Palestine survey, Röhricht lists no fewer than 995 authors writing on the geographical aspect of the country.[3] But no work could be well-established without cartographical accuracy, a deficiency from which even Ritter's own monumental work on Palestine suffered. Thus expositors such as Pusey asked, "Would it be possible to have a quasi-ordnance map of Palestine? I think," he added, "that we shall never properly understand the geography of the boundaries of the tribes but also as to passes, roads, etc., until we have."[4] Admiralty charts had already fixed the coastline but the route traverses of explorers had not been very accurate in fixing inland location. The Palestine Exploration Fund, founded in 1865 as a result of the conviction that the knowledge of Palestine was very inadequate, realized fully the cartographical deficiency.[5] Under the direction of two army officers, Conder and Kitchener, a topographical and archaeological survey of Western Palestine was carried out between 1871 and 1879. A primary triangulation was established and the details completed by prismatic compass sketching, the finished map being drawn on the scale of 1 : 63360. It has remained standard until modern times and is surprisingly accurate in its topography; less than 10 per cent of the Arabic place-names are erroneously transcribed on the twenty-six map sheets.[6] In Transjordan, however, the survey work started by Conder, Mantell and Schumacher has never been completed, although twelve sheets were issued before the close of the nineteenth century and subsequently additional sheets have been made from air-photographs. On the basis of these maps, physiographic

[1] Sir Charles M. Watson, *Fifty Years Work in the Holy Land, 1865–1915* (London, 1915).

[2] C. R. Conder, *Palestine* (London, 1889), pp. 262–3.

[3] R. Röhricht, *Bibliotheca Geographica Palestinae* (Berlin, 1890).

[4] Quoted by Watson, *op. cit.*, pp. 67–8.

[5] Palestine Exploration Fund, *The Survey of Western Palestine* (London, 1881), vol. I.

[6] W. F. Albright, "Palestine in the light of Archaeology", *The Annals of the Amer. Acad. of Pol. and Sci.*, 1932, p. 185.

ERRATA

Page 65, last paragraph, line 14, "excavations" *should read* "explorations."

models have been constructed such as those made by the Palestine Exploration Fund and Koeppel, and a number of historical atlases have been made, such as those of Hagen (1907), Smith (1915), Riess (1925) and the *Westminster Historical Atlas* (1945) by Wright and Filson.

A third and more popular basis of geographical commentaries in the past was the collection of data on customs and folklore. Many resident missionaries like Thomson and Masterman, and scholars like Robinson and Clermont-Ganneau, " were deeply struck with the truth and strength of the Biblical descriptions of manners and customs almost identically the same as they existed at the present day."[1] It is fortunate that a great accumulation of such data has been already published before the present rapid social changes. Much of this literature was written, as Thomson himself acknowledges, " in the countryside, in rural abandon in matter and manner,"[2] but it does bring freshness to the living Word. In Palestinian folklore, however, there is also much which demonstrates the persistence of the old gods of environmentalism, whether as the water spirits, the rain-god Baal, or the other fertility cults.[3]

Advances in the more exact disciplines of geology and archaeology provided other allied bases of Biblical study. Professor Hull's geological expedition to the Dead Sea in 1883–4 was the first comprehensive effort to survey the seismic nature of this region. Next the Survey of Egypt commenced geological mapping in the Sinai Peninsula in 1898, which was continued by later expeditions such as those led by Ball in 1913, Moon and Sadek in 1921. Sir W. M. Flinders Petrie's excavation at Tell-el-Hesi first opened the period of modern scientific archaeology in 1890. Much of the proto-archaeology of Western Palestine, however, has only been gradually unearthed from 1925 onwards. Since the 1930's much knowledge has been gained concerning the Middle Bronze Age which has helped to enliven the narrative of Genesis, while the Iron Age finds have increased respect for the high culture and trade in the age of David and Solomon.[4] Some 1500 excavations made in Transjordan by Glueck have revealed much data on the Nabataeans, the trade-routes and the mining activities centred on the Wadi-Arabah.[5] It is now possible to enjoy a better understanding of the relations between the geographical environment, and the peoples at successive periods, much of which illuminates or enriches the Biblical narrative. The works of Dalman[6] and Koeppel[7] have

[1] Robinson, *op. cit.*, vol. I, p. 498.

[2] W. M. Thomson, *The Land and the Book* (London, 1859), p. vi.

[3] See T. Canaan, " Haunted Springs and Water Demons in Palestine ", *Journ. Palestine Oriental Soc.*, **1**, 1922, pp. 153–70.

[4] W. F. Albright, *The Archaeology of Palestine* (London, 1949).

[5] N. Glueck, *The Other Side of the Jordan* (London, 1945).

[6] D. G. Dalman, *Hundert deutsche Fliegerbilder aus Palästina* (1925).

[7] R. Koeppel, *Palästina* (Tübingen 1930).

ERRATA

Page 66, last paragraph, line 7, "town" *should read* "sown."

been pioneer in the attempt to portray past landscapes with the aid of air-photography and the regional correlation of archaeological sites. Much more research on these lines is now possible, plotting the limits of former cultivation, woodland, hydrological data, ruined settlements, etc. By such synthesis of archaeology and geography it will be possible to reconstruct partially the features of the past landscapes.

The basis of such research will depend upon the assumption that climate has not changed since Biblical times. Yet many observers in Palestine, travelling across the wilderness of Judea, the Negeb or Transjordan, have been impressed by the evidence of former settlement and abandoned cultivation in a land clearly not "flowing with milk and honey". Thus theories of climatic changes in historic times have been propounded by a wide range of writers such as Thomson, Blanckenhorn, Buhl, Hull, Fleure, Brooks, and notably Huntington.[1] Others, however, such as Robinson, Benzinger, Conder, Hellmann, Smith, Gregory and Abel have believed that the evidence for climatic changes cannot be proved from either the information of the Old Testament or from the present condition of the country. This problem is not simply an academic debate, since it is only on the grounds of continuity in ecological conditions that conclusions from the present environment can be made about the past. As Conder argued in 1876 "the change in Palestine is one of degree only and not of kind. The curse of the country is bad government and oppression. Justice and security of person and property once established, Palestine would become once more a land of corn, vines and olives, rivalling in fertility and in wealth its ancient condition, as deduced from careful notices of all such references as remain to us in the Bible and in the later Jewish writings".[2]

Stability of climate in Palestine is clearly evidenced. The Bible distinguishes the wilderness from the desert, as to-day distinction is made between the steppe and the true desert. The life of the settled cultivators is also contrasted with that of the nomads, such as the Simeonites of the Negeb (Gen. 49: 7) or the Rechabites of Transjordan (Num. 32: 1, 16; Jer. 35: 6, 7). The struggle between the peoples of the desert and the town, is graphically described in Gideon's victory over the Midianites (Judg. 6: 11–16; 8: 1–12, 28). The climatic data from the Bible is more convincing.[3] Distinction is made between the hot and cold seasons (Gen. 8: 22 and Amos 3: 15) and Josephus makes similar observations. The inception of autumn rainfall is clearly described (Deut. 2: 14;

[1] E. Huntington, *Palestine and its Transformation* (London, 1911).

[2] C. R. Conder, "The Fertility of Ancient Palestine", *P. E. F. Memoir* (London, 1876), pp. 195–207.

[3] See N. Shalem, "La Stabilité du Climat en Palestine", *Proc. Desert Research* (Jerusalem, 1953), pp. 153–75; also C. M. Botley, "Climate and Weather in the Bible", *Journ. of Trans. Victoria Inst.*, **73**, 1941, pp. 212–35.

Hosea 6: 3; Joel 2: 23) and "rain in harvest" is still proverbial for unusual conditions (1 Sam. 12: 17, 18; Prov. 26: 1). To pray for rain after Pentecost (June) was asking for a miracle (Taanith 3: 3). Variability in the amount and distribution of rainfall was common (Amos 4: 7) and the incidence of prolonged drought is recorded on several occasions (1 Kings 17: 7; Jer. 17: 8; Joel 1: 10–12, 17–20). Recent research by Duvdevani at Karkur has demonstrated the importance of dew in advancing geophytes before the autumn rains arrive.[1] Similarly the notices of dew in the Old Testament suggest its value in dry farming (Gen. 27: 28; Deut. 33: 28; Isa. 18: 4; Zech. 8: 12) and its absence makes the drought the more disastrous (2 Sam. 1: 21; 1 Kings 17: 1; Haggai 1: 10). The incidence of snow is also mentioned. The snow cover on Lebanon, which frequently lasts throughout the summer months in sheltered parts, is a symbol of security for the inhabitants (Jer. 18: 14), while lower down in the Hauran it is not infrequent (Ps. 68: 14). Elsewhere, however, snow is a rare phenomenon (2 Sam. 23: 20). Snow-fed streams account for their maximum volume in May-June (Josh. 3: 15) but most streams dry up in the summer months (1 Kings 17: 7; Job 24: 19; Joel 1: 20), especially those of the Negeb, mentioned in Ps. 126: 4. The sudden spate of streams with the autumn rains is graphically described in the disaster upon the armies of Sisera (Judg. 5: 21) and the parable of the poorly sited house (Matt. 7: 27). Neither have the seasonal feasts of the Jewish calendar been changed in history, indicative of a comparable agricultural rhythm of life throughout the centuries.[2] Finally, there is a similar distribution of crops as in the past. All references to date-palms in the Old Testament are in places where they can be cultivated to-day.[3] The importance of the barley crop in Judea rather than wheat, and the fame of Carmel for its vines and Ephraim and Galilee for olives, are still justified. These selected references from a mass of other literary evidence demonstrate clearly that absolute climatic changes as Huntington postulated have not occurred in Palestine in Biblical times.[4] The subsequent evidence of Arab writers further confirms this.[5]

Apart from climatic conditions, Biblical references allude to many other geographical characteristics of Palestine. Situated on the western edge of the rift valley occupied by the river Jordan and the Dead Sea, it is not surprising that earthquakes and other forms of seismic activity have been the *alter ego* of the country. The disastrous earthquake in 1837 at Safed in eastern Galilee, when four thousand lives were lost, is a recent

[1] S. Duvdevani, "Dew gradients in relation to Climate, Soil and Topography", *Proc. Desert Research* (Jerusalem, 1953), pp. 136–52.

[2] See Talmud, *Mishna Taanith*, ch. 1.

[3] Conder, "The Ancient Fertility of Palestine," *op. cit.*, p. 206.

[4] See also discussion by J. W. Gregory, "Is the Earth Drying up?" *Geographical Journal*, **43**, 1914.

[5] A. S. Marmardji, *Textes Géographiques Arabes sur la Palestine* (Paris, 1951).

reminder of this.[1] There is some evidence that in the land of Midian, south-east of the Gulf of Aqaba, there was active volcanic activity in the thirteenth and eighth centuries A.D.[2] The allusions in Exodus 19: 18 and Ps. 68: 8 are difficult to relate to the site usually identified with Sinai, though it is undeniable that the volcanic cones of Harrat en-Nar, mentioned above, were still active at the time of the Exodus. There are other references to vulcanism (e.g. Jer. 51: 25; Ps. 144: 5), to geological faulting (Num. 16: 31–35), and to earthquakes (Gen. 19: 25; 1 Sam. 14: 15; 1 Kings 19: 11; Matt. 24: 7). The dislocation which downfaulted the southern shore of the Dead Sea,[3] probably caused sulphurous gas and liquid asphalt to destroy the cities of Sodom and Gomorrah (Gen. 14: 10; 19: 23–28). This disaster is vividly remembered and interpreted as divine judgment in many references (Deut. 29: 23; Job. 18: 15; Ps. 11: 6; Isa. 13: 19; Jer. 23: 14; 49: 18; 50: 40; Ezek. 38: 22; Amos 4: 11). The earthquake which appeared momentous in the reign of King Uzziah is used by Amos to date the commencement of his prophetic ministry (Amos 1: 1; cf. Zech. 14: 5).

The Biblical atmosphere of such natural catastrophes explains perhaps the resistance of many geologists in the nineteenth century to the new concepts of uniformitarianism, which now explain the erosional processes of geology and geomorphology. Yet the modern scientist can only applaud the sagacity of Solomon's observations concerning the cycle of nature (Eccles. 1: 4–9). The everlasting character of God (Isa. 40: 28) is fully revealed in the Old Testament allusions to His continuous activity in the natural forces of the environment (e.g. Ps. 104: 29–30; 147: 8–9; 16–19; Jer. 10: 13). This outlook of continuous creation is fully in harmony with the modern knowledge of the natural sciences. Apart from this general philosophical outlook common to all lands, there are particular allusions to the distinctive context of the Palestinian environment. Its Mediterranean features are epitomized by a feeling of balance and restraint, in a land where man has established himself on the frontiers of permanent settlement between the desert and the sown. Thus it is recognized that neglect of cultivation soon brings evil consequences (Prov. 24: 30–34). War upsets the limits sustained between the wilderness and the sown. Hence the Israelites were told by Jehovah, "I will not drive them out from before thee in one year; lest the land become desolate and the beast of the field multiply against thee. By little and by little, I will drive them out from before thee until thou be increased and inhabit the land" (Exod. 23: 29–30). Fires easily spread during the summer drought,

[1] E. Hull, *Memoir on the Physical Geology and Geography of Palestine* (London, 1886), p. 97.

[2] Father Abel, *Géographie de la Palestine* (Paris, 1933), Tome I, p. 49.

[3] See discussion following paper by E. W. G. Masterman, "The Dead Sea and the Lost Cities of the Plain", *Journ. of Trans. Victoria Inst.*, **69**, 1937, pp. 212–29.

spreading across the mountain scrub (Ps. 83: 13–14). Soil erosion is another threat, possibly alluded to (Job 14: 18–19), and the " slippery places " so frequently mentioned are testimony to the rapid dissection and sharp relief associated with the cycle of erosion in semi-arid highlands (Deut 32: 35; Prov. 3: 23; Jer. 23: 12; 31: 9). Aeolian deposition resulting from wind erosion is another feature of the environment characteristic of the " Hammada " of the Negeb, and the loessal deposits of the Judean Highlands. Direct reference is made to it in some verses (Exod. 10: 20–23; Deut. 28: 24; Nahum 1: 3). Locusts brought with desert winds are also characteristic, the invasion of which is depicted in some terrifying passages (Exod. 10: 4–7, 12–15; Deut. 28: 42; Joel 1: 4, 7, 15, 16, 18), and whose habits are well recognized (Ps. 109: 23; Prov. 30: 27; Nahum 3: 17).

It is clear from the context of most of the references alluded to above, that the environmental background is not described *per se*, but as the incidental framework of moral issues. The Hebrews had no word for ' Nature ' other than the idea of the activity of Jehovah Himself.[1] Thus the narratives, poetry, wisdom books and prophecies are all loaded with allusions to the acts, judgments, blessings and mysteries of God's activities through the medium of nature. God spoke in the thunderstorm (Exod. 9: 28; 19: 16, 19; 1 Sam. 7: 10; 12: 18; Job 37: 1–5; Ps. 18: 13; 29: 3–9; 104: 7), blessed in the rainfall (Levit. 26: 4; Deut. 11: 14; Ps. 104: 13; 147: 8; Isa. 41: 17–19), breathed in the wind (Gen. 1: 2; cf. Isa. 40: 7), cursed in the drought (Lev. 26: 19–20; 1 Kings 17: 1; cf. 18: 1; Amos 4: 7), judged in the earthquake (Job 39: 24; Jer. 4: 24–26) and manifested His glory in the heavens (Ps. 8: 3; 19: 1). There were some like Elijah, who recognized that God's revelation lay beyond nature. It was his experience that Yahweh was neither in the wind, earthquake nor fire, but in the consciousness of a still small voice (1 Kings 19: 11–13). The Hebrew faith, which saw God working in the activity and mysteries of nature, realized He was also transcendental (Hos. 2: 21–23). Yahweh was not circumscribed by the environment, as the Syrian pagan cults suggested in the well-known passage of 1 Kings 20: 23, 28 (cf. Ps. 121: 1–2). If their belief in God was not credulous, neither should it be faithless. The crowd who thought it thundered did not have the insight to know God spoke (John 12: 28). Similarly to-day, we may seek to interpret the nature miracles of the Bible in terms of an understanding of the physical phenomena, such as the plagues of Egypt (Exod. 7–10), the wind that provided a passage across " the Red Sea " (Exod. 14), the landslide that dammed the Jordan at Tell-es-Saidiyeh (Josh 3: 16), the lightning that consumed Elijah's sacrifice on Mount Carmel (1 Kings 18: 38) and many other

[1] H. Wheeler Robinson, *Inspiration and Revelation in the Old Testament* (Oxford, 1946), pp. 1–16.

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Page 70, line 2, "presupposition" *should read* "presuppositions."

instances. The acceptance of such narratives depends not upon our scientific beliefs but upon our presupposition. Either they can be explained away and nothing miraculous is left, or else our faith will accept them as miracles of coincidence in each case, and interpret them as instances of God's active intervention. Knowledge of the physical process involved, may help us to answer the question "What caused it?" but only faith in the divine revelation enables us to know why it was caused. In such fear is the beginning of wisdom.

It is from this standpoint that the moral significance of the geographical environment is the most profitable study to the Christian. As a denial of environmental determinism, Sir Charles Warren was right when he said in a lecture to this Institute, "So far as the physical effects of Palestine are concerned, I do not think that they can have had any appreciable effect on the mind or actions of the people beyond influencing the imagery used in their writings."[1] But he overlooked the moral issues involved in the environment of Palestine, for the elements of position, climate and economy all formed an intensive background to their religious life and problems. For example, the nodality of Palestine has blessed and cursed it, according to conditions of peace and commerce, war and invasion. This land-bridge of "the world island",[2] focussed on the trade-routes of Afro-Eurasia, provided the moral challenge of reliance upon diplomacy and material wealth, or upon the unseen power of Jehovah. This was the burden of the prophetic messages. Of the two great trade-routes, the coastal highway from Egypt and the inland route from Arabia through Transjordan to Damascus and beyond, only the latter could be controlled by Israel without upsetting the strategic interests of the great powers to the north and to the south (1 Kings 9: 26–27; 10: 1–2, 15). Even in Solomon's day the coastal highway was too much controlled by the sea-powers to warrant any interference there (1 Kings 9: 11; 10: 22; Ezek. 27: 17). On the royal highway of the interior, Edom alone was the strong rival and hence the bitter hatred expressed in prophetic books such as Obadiah.[3] Thus in the pivotal position of Israel it was easy to forget Jehovah, seeking alliances abroad, and, as middlemen, to become absorbed in the wealth brought by the trade-routes.

The climate also was fraught with moral issues. When the Israelites entered Canaan they were warned that they could not depend on the mechanical assurance, such as was provided by Nile irrigation; they would be cast upon the bounty of God in a sub-steppe climate of uncertain rainfall (Deut. 8: 3, 7–10; 11: 10–17). The sedentary settlements of the Canaanites had previously been located at the foothills or on the plains

[1] Sir C. Warren, "The Significance of the Geography of Palestine", *Journ. of Trans. Victoria Inst.*, **49**, 1917, p. 191.

[2] Sir H. J. Mackinder, *Democratic Ideals and Reality* (London, 1919), p. 89.

[3] Glueck, *op. cit.*

where the chief series of springs outcropped, and where shallow aquifers made many wells possible.[1] The invention of a mortar impervious to water at the turning point of the Bronze Age and Iron Age, made it possible to store water in cisterns. This helps to explain the rapid expansion of Israelite settlement in the hill lands of Judea and Samaria, colonizing clearances in the woodland, which formerly, with few exceptions, had not had a sedentary population (Josh. 17: 15, 18). The great number of place-names in the Wilderness of Judea with the prefix *Bir* or cistern is significant. In a subsequent age, Josephus makes mention of 240 nucleated settlements in upper Galilee which were dependent upon cisterns.[2] Thus rainfall and water storage were significant in the moral life of Israel. There was the continuous temptation to submit to the environmental conditions of drought and to worship the rain-god Baal, or to trust in the material provision of cisterns rather than to trust in Jehovah (Jer. 2: 13). The Ras Shamra tablets have shown how Baal dominates the Canaanite pantheon. As the god of fertility he was worshipped particularly in the rich agricultural lands, especially in the north (Josh. 11: 17; 12: 7; Judg. 3: 3). In this context Elijah's victory against the priests of Baal on Mount Carmel was a triumphant vindication of Jehovah (1 Kings 18). As a later prophet said, " Are there not among the vanities of the nations any that have the power to cause rain? or do the heavens give showers? Art Thou not He, O Lord our God? In Thee do we hope; for Thou hast made all things " (Jer. 14: 22).

In the environment of the semi-steppe, climatic conditions discourage a peasant society because droughts tend to introduce debt and servitude. Yet the ideal Hebraic economy, which was envisaged at the entry into Canaan, was a system of small landowners with no large estates, no strange labour and no slavery of kinsmen, features which were to be maintained by the ideological privilege of sabbatical years (Levit. 25). By the time of the monarchy, however, crown land (1 Sam. 22), corvée (1 Sam. 8: 16) and large estates (1 Sam. 25: 2) had clearly modified the system, though the ideal was sustained in the aspirations of the prophets (e.g. Isa. 36: 16; Micah, 4: 4; Zech. 3: 10). Such changes may be understood simply in the context of the continual struggle between the desert and the sown, but to Israel it implied spiritual issues. It is significant that our Lord probably began His ministry in a year of Jubilee. But when He preached " the acceptable year of the Lord " it was to introduce a new moral order, distinct from that of the Old Testament.

Finally, in more obvious ways the geography of Palestine has influenced the history of its peoples. The ideal unity of the kingdom, so frequently envisaged as extending " from Dan to Beersheba ", is fragmented by the

[1] See Abel, *op. cit.*, pp. 145–6, for a study of the distributions of springs.
[2] Quoted by W. M. Thomson, *op. cit.*, p. 293.

multiplicity of small physical units. Within the 6,000 square miles of Western Palestine, there are at least twenty-nine distinct morphological regions, which may be grouped broadly into the highlands of Judea, Samaria and Galilee, the Shephelah or western foothills, the lowland basins, the coastal plain, the Negeb, and the Jordan valley. Within each of these units, diversity of soil types and climatic conditions accentuate distinctive features apparent in the characteristic economy and history of each region; lucidly illustrated in Sir George Adam Smith's great work. In addition, the exposed position of the country has made it the melting-pot of many peoples and the focus of syncretic languages. It is a mistake to over-emphasize the peculiar distinctiveness of Israel, which has been often in the past the result of a vacuum of ignorance concerning other Canaanite peoples. The miracle of Israel's history has been the preservation of its individuality, despite aberrations of mixed marriages by its members (Deut. 7: 3–5; cf. 1 Kings 11: 1–8; 14: 21; 16: 31; Neh. 13: 23–27). In the light of this, it is understandable why we have so many geographical details concerning the delimitation of tribal boundaries in the book of Joshua. As God used nature for the benefit of His people, so He had prepared the land specifically for their occupation. Certain tribal limits are clearly related to relief features. The rift valley of the Jordan, for example, has always been a separator of peoples, so it is apparent why Moses was perturbed by the decision of Reuben, Gad and half of Manasseh to remain on the east side in Gilead (Num. 32: 5–7, 16–19). It is significant that there is an absence of Biblical place-names in Transjordan. In contrast, the separation between the kingdoms of Israel and Judah does not have a clear physical basis. The strategic elements of passes and routeways are important, however, in the warfare of Palestine. Garstang has used terrain appreciation to admirable advantage in his study of the military campaigns contained in his *Joshua-Judges* (London, 1930). Similarly, the narrative of the Exodus can be traced geographically with some success, as in the summary given by Wright and Filson.[1]

This paper has inevitably covered a wide field. Much has been learnt since Robinson made his epochal contributions to the geographical background of the Bible. Yet a great deal remains to be done in a closer synthesis of archaeology and geography. Such study cannot provide an ultimate explanation of the Old Testament. It may explain only some of the conditions of divine revelation. For unlike the pagan rites of Israel's neighbours, which appear closely moulded within the framework of the environment, the faith and history of the Hebrews break out imperviously from this mould and find new sphere in a unique revelation of God. It is, however, in a real world that this divine message has been declared so that its landscape can be recognized as vividly as its people.

[1] G. E. Wright and F. V. Filson, *Westminster Historical Atlas to the Bible*, pp. 37–41.

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923RD ORDINARY GENERAL MEETING

OF THE

VICTORIA INSTITUTE

AT

THE CAXTON HALL

WESTMINSTER, S.W. 1

ON

MONDAY, 24th MAY, 1954

Professor MALCOLM GUTHRIE, Ph.D., B.Sc., A.R.S.M., in the Chair

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ANNUAL ADDRESS

THE VICTORIA INSTITUTE AND THE BIBLE

By

F. F. BRUCE, M.A.

THE VICTORIA INSTITUTE
22 DINGWALL ROAD, CROYDON, SURREY

THE VICTORIA INSTITUTE AND THE BIBLE

By F. F. Bruce, M.A.

I. The Institute and Biblical Scholarship

The Victoria Institute is an avowedly Christian society, even if it is at the same time an investigating body. The fact that a philosophical society with a Christian basis should devote itself so unrestrictedly to investigation in every realm of human interest reflects the sturdy faith of its founders that all truth must be one, and also their complete freedom from obscurantism—from any anxiety lest their investigations might lead to the discovery of inconvenient or unpalatable facts.

The first object for which the Institute was established is stated thus: "To investigate fully and impartially the most important questions of Philosophy and Science, but more especially those that bear upon the great truths revealed in Holy Scripture; with the view of reconciling any apparent discrepancies between Christianity and Science." The place given in this statement to "the great truths revealed in Holy Scripture" suggests that the relation of this Institute to the Bible is a subject of high importance to all its members.

Some of us no doubt belong to churches or other confessional fellowships in which the doctrine of Holy Scripture is more explicitly defined; there is naturally room in such bodies only for those who subscribe to these more explicit definitions. But the Victoria Institute is not a body of this kind. Our constitution recognizes "the Christian religion as revealed in Holy Scripture" without trying to define the nature of revelation or the exact content of what is revealed; just as it provides that Fellows and members of the Council shall be "professedly Christians" without trying to delimit the meaning of the term "Christian". This affords a wide basis for pursuing the researches which form the purpose of our existence, and the Institute would fall short of that purpose if it came to be identified in the public mind, or in actual fact, with one particular view of Biblical revelation or one particular Christian tradition.

But since we do acknowledge the distinctive authority of Holy Scripture, it is proper that Biblical studies should figure on our programme year by year. It would be well, too, if we made more use of the wealth of Christian Biblical scholarship available in this country. The Institute, of course, has always counted leading Biblical scholars among its members and

officers. The list of former Presidents includes the name of Dr. Henry Wace, Dean of Canterbury, and more recently that of Sir Frederic Kenyon. Sir Frederic did not think of himself as a Biblical scholar, but it is widely recognized that his contributions to Biblical scholarship were of the highest value.

A study of the back numbers of our Transactions, however, shows that not infrequently matters of Biblical scholarship have been dealt with by men whose special claims to eminence did not lie in the Biblical field at all; and sometimes (it must be said) the results were not such as to raise the prestige of the Institute. We should immediately realize the unwisdom of inviting a specialist in Biblical philology to discourse on (say) organic evolution, but the equal unwisdom of inviting a distinguished biologist to read a paper on (say) the Seventy Weeks of Daniel has not always been appreciated (as it certainly would be to-day).

I have long been struck by the widespread view that any man's opinion on Biblical subjects is as valid as any other man's, but the prevalence of this idea has been brought home to me with special force since I exchanged the teaching of classical philology for the teaching of Biblical history and literature seven years ago, because I do not remember meeting a comparable idea in the field of classical studies. I know that this idea in the Biblical field to some extent reflects a healthy instinct which will not permit the Bible to become the preserve of specialists, but insists on its remaining (as it is) Everyman's book. Sometimes, however, this idea takes the extreme form of a conviction that the specialized study of Biblical subjects positively disqualifies a man from expressing an acceptable opinion on the Bible. It is possible that this conviction has even been ventilated in our Institute; at any rate, as I read some back numbers, I get the impression at times that some experts in other realms of study who have read papers on Biblical subjects are persuaded that Biblical specialists very often do not really know their own business.

I was interested some time ago, when studying old membership lists, to observe that for a number of years one of the leading Biblical scholars in our English Universities in a former generation was a member of the Institute; I was equally interested to observe that he never read a paper before the Institute. Of course, he may have been invited to read one and declined; I cannot say.

At the same time, I should not dream of suggesting that non-specialists should never air their views on Biblical criticism and interpretation in a learned society such as this. The previous Chairman of our Council, the late Air-Commodore P. J. Wiseman, whom we all remember with grateful affection, made some acute contributions to Biblical studies both in the Institute and outside; and his is not the only name we can bring to mind in this regard. Very often the contributions of a non-specialist are peculiarly fresh and stimulating, as he looks at the subject and raises questions from an unusual point of view.

We are—and properly so—a mixed lot in this Institute, and our approaches to the Bible will vary. The mathematician or natural scientist, for example, contemplating (say) the second and third chapters of Genesis, may be inclined to interpret them with exact literalism and either dismiss them too hastily or expend needless toil in reconciling with his scientific knowledge language which really calls for no such reconciliation. The student of literature, on the other hand, may recognize in these chapters a style of highly symbolic diction such as he is familiar with elsewhere. The philosopher may concentrate on eternal truths which he discerns beneath the picturesqueness of the narrative. The anthropologist may compare the beliefs reflected there with beliefs held at various times in other parts of the world. The historian may try to determine the chronological setting of the stories and to understand them against their contemporary background. The student of ancient geography may try to fix the location of Eden in terms of the four rivers mentioned in the story. The archaeologist may try to relate the Genesis narrative to parallel narratives extant in early Mesopotamian and other records. The Biblical critic may collate the Massoretic and Samaritan texts with the ancient versions or try to discover the source or sources from which the narrative was derived; he may even try to penetrate beyond the earliest ascertainable written form to an antecedent oral stage. But the theologian, and all Bible readers who bear in mind the prime purpose for which the Bible was given, will ask what these chapters teach us about God, and about our duty to Him. They will recognize, of course, that these chapters belong to an early stage in God's progressive revelation of Himself, but they will also recognize that these chapters do have the nature of revelation, and only by approaching them thus can we begin to grasp their essential meaning. All the other approaches have their varying values, but their chief value lies in the service which they can render to the theological understanding of these chapters (as of the whole Bible).

"The Scriptures principally teach," said the Westminster divines, "what man is to believe concerning God, and what duty God requires of man." If we believe that, we shall understand that in the study of these chapters of Genesis it is not nearly so important to argue whether a serpent really spoke or not as it is to consider seriously what the serpent really said. For what the serpent said to Eve is what the same serpent is still saying to us, in an endeavour to distract our minds from God's revelation of Himself and of His will.

The other avenues of approach are by no means unimportant or irrelevant. But they become most important and relevant when they are made to subserve the primary interpretation of the Scriptures as divine revelation. And here surely is the whole *raison d'être* of our Institute. In all our divergent fields of study we have a common interest which brings us together, and that common interest is the Christian faith. The various sciences to which we devote time and strength (Biblical science included)

will yield their most fruitful results if Theology is accorded her true place as queen of the sciences. Whether she receives her crown rights elsewhere or not, here in the VICTORIA INSTITUTE they can never be disregarded. And Christian theology can be nothing other than *Biblical* theology, if the Bible is rightly recognized as the unique recital of God's saving and self-revealing activity on which our faith rests.

II. BIBLICAL SCHOLARSHIP AND CHRISTIAN ORIGINS

Sir Frederic Kenyon, in successive Annual Addresses which he delivered as our President, emphasized the special opportunities presented to the Institute to meet the need of the hour, provided that our work was characterized by " liberty of investigation, an open mind, charity towards our opponents, and faith in the victory of truth." One particular way in which he thought the Institute might well provide " the sound basis of scholarship " for carrying on the struggle against anti-Christian forces was in making known the historical foundation of the Christian faith. This is something which I should like to repeat and underline.

For Christianity is nothing if it is not a historical faith—that is to say, a faith founded on things which have really happened. Some Christian leaders have propounded outlines of " basic Christianity " which (they urge) men and women might well accept and live by, even if (*per impossibile*) it could be proved that Jesus of Nazareth had no historic existence. But such a " basic Christianity " is a very different thing from the basic Christianity of the apostles, which consisted in the affirmation that God had acted for the redemption of mankind in the events of the life, death and resurrection of Jesus of Nazareth. The beliefs and ethical principles of which modern " basic Christianity " consists were certainly inculcated by the apostles, but the apostles inculcated them as corollaries of the redeeming act of God in Christ. And if we continue to use the term " Christianity " in its historic sense (as we should), then Christianity must rest upon the foundations of the apostolic witness.

At this point it will perhaps be interjected that I am doing the very thing that I deprecated earlier—imposing a restrictive definition on the word " Christian ". I hope I am not. The propounders of the " basic Christianity " I have in mind are sincere and highly esteemed Christians; it is not their personal Christianity that is in question, but their wisdom in recommending as essential Christianity something which omits what was fundamental and indispensable to Christianity as first proclaimed.

Julian the Apostate might say of certain pagan mysteries of his day: " These things never happened, and yet they are eternally true." But the glory of the Christian μῦθος, the ἱερὸς λόγος of our salvation, is that it

did happen once for all, as a real historical event, in the Roman province of Judaea, when Pontius Pilate was procurator; and *therefore* it is eternally true.

There has never been a time when the evidence for the truth of Christianity, rightly so called, was more abundant and cogent; what our time demands is that this evidence should be made widely known.

From time to time books appear which profess to tell the story of Christian beginnings as they really happened, with the implication that the account which has come down to us in the New Testament writings is too tendentious, too completely rewritten in accordance with an unhistorical bias, to be accepted as a trustworthy source of information. It cannot be too strongly emphasized that the sources of information which the authors of some of these books prefer to the apostolic writings are much later and more precarious than those which they reject—where the authors do not draw on their own imagination. No one will quarrel with a writer for drawing on his own imagination and publishing the product as an avowed work of creative fiction; books like George Moore's *The Brook Kerith* or Robert Graves's *King Jesus* are of this kind, and since they claim to be fictitious reconstructions they must be appraised as such. It is not works like these, but others which are presented as the products of scholarly and dispassionate research, that I am thinking of. The trained historian will not be led astray by them, nor yet the ordinary Christian who knows whom he has believed, and has some acquaintance with the origin, nature and transmission of the New Testament; but for the sake of others who might be deceived it is desirable that the historical foundations of our faith should be made more widely known than they are.

The New Testament, to be sure, is not a disinterested account of Christian origins such as might have been recorded by a reporter from another planet. The men who wrote it were too totally committed to the truth of what they recorded to present it in a spirit of complete detachment. These things were literally matters of life and death to them. The New Testament is, directly or indirectly, the transcript of the personal testimony borne by the apostles to Jesus as Saviour and Lord: "what we have seen and heard we now make known to you." But in bearing this testimony they constantly challenged the severest scrutiny of their claims: this thing was not done in a corner, and the events were sufficiently recent to be investigated impartially. Not that historical research then or now will suffice to make a man a Christian. But many of our contemporaries who would fain be wholehearted Christians are deterred, I believe, from this total commitment by the idea that the intellectual basis of the Christian faith has somehow or other been undermined. If this stumbling-block could be removed from their minds, and if this Institute could do something towards its removal, that would be an inestimable service to our age.

III. Christian Origins, The Bible, and God

But the Christian story is not detached from its background. A heretic like Marcion might begin his edition of the New Testament with the announcement that " in the fifteenth year of Tiberius, Jesus came down to Capernaum "—down from heaven, full-grown, having no link, biological or historical, with anything that went before. He might insist that the Creator-God of the Old Testament was a completely different being from the superior Redeemer-God of the New Testament. But the gospel which has been delivered to us, in which our salvation lies, tells a different story. It tells how the God who brought the universe into being by His creative will, whose tender mercies are over all His works, who cares for all mankind, who chose His people Israel that they might communicate the knowledge of His truth to the other nations of the earth, and who therefore displayed His mighty acts of mercy and judgment in a special way in Israel's history, is the God who ultimately fulfilled His age-long purpose and promises by sending His Son for our redemption. It tells how the Divine Word became flesh, sharing our nature that as man He might work out man's salvation and make us partakers of His nature. The story is one, and the whole Bible is the book which records it.

But if that is so, what endless scope there is for our investigations in every field of knowledge! For there is nothing in the universe which is irrelevant to the knowledge of God the Creator; nothing pertaining to mankind that is irrelevant to the knowledge of God our Saviour. Moreover, since this God is one God, all truth, however discovered, is His truth, and is therefore ultimately one. Lack of knowledge may make it necessary for us to suspend judgment on many things; but we cannot be true to the purpose of this Institute and hold mutually contradictory beliefs. Whether we study the natural revelation of God in His works of creation and providence, or His redemptive revelation enshrined in the Bible, we need never be afraid of discovering something that will undermine our foundations; we can do nothing against the truth, but only for the truth.

Many things in the Bible which belong rather to the setting of God's revelation than to the essence of the revelation are fascinating subjects of study in themselves; but it is good to keep them in their proper perspective by considering what part they play in relation to God's saving Word to men. It is, for example, interesting to study the census figures in the Book of Numbers, over which there was much serious disputation in the very early days of our Institute. Were there (we may ask) actually six hundred thousand men of military age in the wilderness, or was the real figure more like five thousand, or have the figures of David's census somehow strayed into the wilderness narrative? Whatever the results of a study like this, we shall not nowadays argue the point with a warmth

that would suggest that the truth of Christianity depends on the answer.

There is never any need to tremble for the Ark of God; it is always good for us to tremble at the Word of God. And we use the Bible aright if we use it in such a way as to hear that Word speaking to our heart, and assuring us that God has reconciled us to Himself by Jesus Christ. The Spirit of truth, the Lord and Giver of life, who spoke by the prophets, still bears witness to Christ in all the Scriptures and, as I read them, supplies the inward guarantee that here is God Himself speaking to me.

To compare the truth discovered from the study of the Bible with the truth discovered in the pursuit of our other studies is both necessary and profitable, but it can take us only so far and no farther. For the purpose of the Bible is that we may know *God*, and therefore any light that the Bible may throw on these other subjects of study is incidental and secondary. They show us but the outskirts of His ways; the Biblical revelation lays bare His very heart.

The Bible was not given, for example, that we might know exactly the order of events at the beginning of time or at the end of time, or even the order of events in the intervening course of time. Those parts of the Bible which deal with the First Things and the Last Things are primarily intended to teach us not about these things themselves but about the One who is Himself the First and the Last, the Creator of all in the beginning and the Judge of all at the end. And in so far as the Bible deals with the intervening course of time, its main burden is not the sort of thing for which we have recourse to secular histories, but the message that at the consummation of the ages, the nodal point of time, the real judgment-day of this world, God revealed Himself supremely in Christ. The age-long war between good and evil, as Oscar Cullmann has reminded us, is not of doubtful issue; the decisive battle was fought, the decisive victory won, in the passion and triumph of Christ. The Victory Day celebrations still lie in the future; the important thing is not whether that Victory Day is near or remote, but the fact that its advent is already assured by the finished work of Christ. The Lion of the tribe of Judah has conquered; the slaughtered Lamb is Lord of history.

Our situation to-day is very different from that in which the VICTORIA INSTITUTE came to birth eighty-nine years ago. But as then, so now, there is need for a body of men and women who love the truth and are prepared to follow it wherever it may lead, assured that it can only lead us towards the God of truth. In a day when earth's foundations flee, it is good to follow Herbert Butterfield's counsel: "Hold to Christ, and for the rest be totally uncommitted." But those who hold to Him who is truth incarnate and love all truth for His sake, will see light in His light, and by so doing they will not only save themselves, but others also.

Chairman's Remarks

Professor Malcolm Guthrie said: We are indeed grateful to Mr. Bruce for his interesting address, and for the way he has focussed our attention on the central place the Bible occupies in the purposes of the Institute. It has been good to be reminded of the essential fact that the God of the Book is the God of the universe, and therefore nothing has to be feared from any investigations either of His words or of His works.

There are, however, one or two points on which I should like to make a brief comment. In particular I suggest it would not be desirable to press too far the idea that scholarship is necessary for an understanding of the Bible. Surely we should all agree that it is only as we know the Author of the Bible that it becomes an open book, and in fact the depth of a person's knowledge of God may well be a measure of his competence to unfold the mysteries of the Scriptures. If we are thinking about the elucidation of the Bible in the same way as one might elucidate Shakespeare, then it is not even necessary to be a Christian. Nevertheless I know our speaker would be the first to agree that although an unbeliever could be a theologian in the narrow sense of the term, only a Christian could ever hope to expound " God's saving and self-revealing activity on which our faith rests ".

Then, further, while fully agreeing that we do well to make known the evidences for the truth of Christianity, I wonder whether in fact it is from doubts about these things that men refuse to become Christians. Is it not that the reasons for the rejection of the Gospel are normally to be sought not in the intellectual realm but rather in the absolute moral demands made by Jesus? No doubt there are those who think they are being deterred by doubts about the historicity of the Gospel story, but all too often this is due to causes that would still remain even when we have made our case clear.

The only other thing I want to mention is the suggestion that we must not hold mutually contradictory beliefs. It is clear that we must never assert in one connection that something is true which elsewhere we have stated to be false. Nevertheless, in a realm where we are dealing with activities of God Himself, it would not be surprising to find ourselves faced with two things, both true, which to our limited minds appear to be incompatible. Indeed, in the final resort, as our speaker himself has suggested, since we are concerned with Him who is Light, it is in Him alone that in the end we too shall see light.

RECENT THEORIES OF THE ORIGIN OF MAN

By

DOUGLAS DEWAR, B.A., F.Z.S.

DISCUSSION

THE CHAIRMAN (N. N. E. BRAY, Esq., O.B.E.) said that, after twenty-five years' study of the subject of evolution from the viewpoint of every relevant science, he was convinced that the theory violated all the basic laws of the universe. Man, he concluded, was created as man, and will continue to be man so long as the Creator maintains these laws in being.

Dr. WHITE said: The Victoria Institute is indebted to Mr. Dewar for the wide scope of his paper and for the amount of reading and research it must have demanded.

Many of the theories he brings forward do more credit to the imaginative powers of biologists than to their intellects. Some of these theories appear to be based on little or no scientific evidence. They are not founded on demonstrable facts, but on fantastic conceptions. I have often thought that some psychologists show great fertility in inventing new theories and in coining new words, but it is evident that biologists display an even greater facility in this direction.

Not only are many of the theories of evolution brought forward by Mr. Dewar of a fantastic nature, but they are mutually contradictory. Anyone seeking for the truth about evolution must find himself considerably bewildered when he finds that there are as Mr. Dewar states, about thirty modern theories, and that many of them are mutually destructive. It makes one more sceptical than ever about the hypothesis of the descent of man from the lower animals.

One turns with relief from this welter of confusion to the simple and majestic statement of Genesis that God created man in His own image.

Mr. W. E. FILMER asked: Is sufficient known of *Telanthropus* to discern the characteristic features of apes defined by Wood Jones, and listed in the first paragraph on p. 14?

Mr. TITTERINGTON said: Mr. Dewar's description of the breccia in which the South African remains have been found reminds one somewhat of the

Ossiferous Fissures, described by Prestwich. It would be interesting to know if the deposits are in fact similar in nature and origin; could Mr. Dewar give us any information on the point? Also, is it possible to give some idea of the probable age of the deposits—are they to be classed as recent, Pleistocene, or what?

Written Communications

Professor F. E. Zeuner wrote: I wish to congratulate Mr. Dewar on his admirable summary of theories of human evolution, of which he has selected twelve. I agree that these show a great variety of shades of opinion, but they all imply human evolution as such.

The statement of Reinke which Mr. Dewar quotes at the end of his lecture and which he still regards as valid, I am unable to accept. If it said " Science knows *little* of the origin of man ", I should wholeheartedly agree. But to say " Science knows *nothing* of the origin of man " was an exaggeration even in Reinke's day, due presumably to the very human desire to stress his point.

The various theories of human evolution current to-day are actually less dissimilar than might appear from Mr. Dewar's lecture, since their differences are in part due to different interpretation of certain fossils, and in part to differences of views concerning the mechanism of evolution.

That the evolution of man is accepted is due to two sets of observations. The first is that evolution has taken place in the animal world, in particular among the mammalia. I could quote many examples of geological sequences in which the characters of certain animals change gradually and yet in which the first and the last members are completely different species, if not genera, so that evolution here must be accepted as a fact. Perhaps the most fully documented series is that of the horses, which begins with five-toed forms and finishes with single-toed ones. Another example is the evolution of the mammoth from its ancestor, the Southern Elephant, well documented by many thousands of specimens.

Since man is a mammal from the point of view of morphology, physiological and mental make-up, it is logical to expect that he also came into being by evolution. Human fossils, however, are comparatively rare, and it is for this reason that his line of descent is but incompletely known. Incompleteness, however, does not mean that *nothing* is known, and the fact that the significance of certain fossils is under discussion does not mean that the theory is wrong.

Whilst the fact of evolution can only be denied with difficulty, it is quite a different matter to say what the causes of evolution are. I am deliberately avoiding the term *mechanism*, because it implies an exclusively material cause. Some indeed believe that such exists. On the other hand, there was a time a hundred years ago, when it was popular to accept evolution but to interpret the numerous little progressive steps as creative acts of God.

Personally, I find it impossible to interpret living creatures as purely mechanical contraptions. I have tried to indicate this in the appendix to the third edition of my book, *Dating the Past*, and in several papers on the time factor in evolution. The mental activities of living creatures are something qualitatively different from physical properties, and it is useless to deny their existence for that reason, just as there is no point in denying the existence of a spiritual world. Much of the success of modern sciences in describing Nature and her processes is due to a gigantic act of abstraction. By selecting physically treatable characters for description and study, one has simplified the issue, for the living thing can thus be treated as if it were dead and therefore just like any other piece of matter. But the problem of life has in no way been solved by forgetting about it.

In my opinion, the influence of mind on evolution has at all times been considerable. Changes in the habits of animals have played a great part in directing evolution into new channels, in so far as the physical constitution of the animals made this possible.

In the case of man, it appears that a primitive kind of ape, which had taken to living on the ground instead of on trees, developed the habit of running. This brought about the important aromorphosis of erect posture. It freed the forelegs from the duty of locomotion completely, and the hands could become more delicate gripping organs than are found anywhere among monkeys and apes. But this would never have happened, had those pre-human creatures not had the good idea of using their hands accordingly. The pious person might say that this idea was inspired by God.

That the great development of the human brain was a consequence of erect posture has been pointed out by others and by myself. One can say therefore that the idea of running fast in an erect position stands at the beginning of the human branch of evolution.

At a later stage the regular use of tools became the characteristic of this human ancestral group. True enough, apes use branches or sticks occasionally, but man began to shape them intentionally so as to suit his plans of action. Again we notice that a step forward is made which is not the inevitable result of physical constitution. It is the idea of doing something in a certain way that is decisive. Hunting of game was one of the new practices adopted by our distant ancestors. It was made possible by the use of throwing-stones and throwing-sticks and is not found in this form anywhere among the monkeys and apes.

Human technology, too, has evolved gradually from very simple beginnings in the early Stone Age to what it is to-day. Wherever a step forward is observed, for instance, when a more skilful technique of flaking stone appears, or when the smelting of metal ores is discovered, or when food production is started by sowing seeds, it is the *new idea*, which must have come to some individual (or a small group of individuals), that has caused the step forward. If that idea had not occurred to somebody, nothing would have happened, although the physical conditions for it to happen were all there.

I therefore hold that, whilst evolution as such cannot be denied, the evidence for it being too convincing, the progress implied in evolution is not solely due to physical phenomena.

Miss VERA BARCLAY wrote: Although Mr. Dewar has made his chief analysis in connection with the theories of Dr. Broom and his colleagues, and although these theories (so influential at present) by-pass the two *Pithecanthropus* groups, most of the other theorists whom Mr. Dewar deals with depend in very great measure on the fact that these " hominid " fossils are taken to be proof positive that an intermediate type between ape and man has been found; even though it may not be in the direct line of descent to *Homo sapiens*. This belief has also strongly affected not only the lay public but the theologians—as may be seen by several books and articles recently published by Roman Catholic writers (in spite of the serious warning and explicit limitations expressed in the Pope's 1950 encyclical, *Humani generis*). The attention of evolutionary experts who have written on Java and Peking Man has been concentrated on the morphological details of the fossil remains rather than on the sites. It is of interest that Prof. E. Weidenreich very shortly before his death, wrote a paper (published in *The Scientific Monthly*, U.S.A., Aug. 1948) in which he contended that neither brain-size nor brain-convolutions and fissures have much to do with intelligence; while still more important (especially if applied to the Java and Peking finds) is the following: " Studies made on skeletons alone will never enable us to make statements about either the mentality of the individuals concerned, or about mental change or progress over a period of time. Cultural objects are the only guide as far as spiritual [? intellectual] life is concerned. They may be fallacious guides too, but we are completely lost if these objects are missing."

The same view is implied in words of Prof. Josef Kaelin, who, after describing the ape-like features of the Peking skulls, told the Pax Romana Congress at Amsterdam in 1950 that the human status of *Sinanthropus* " is established *by the ethnological documents* described by l'Abbé Breuil: remains of fire-places, primitive tools in bone and stone " (italics mine). This is striking as coming from an anatomist.

I have just completed a lengthy examination of the published reports on the finding of these fossils and artifacts between 1923 and 1940. This examination seems to indicate (1) that Boule was right in insisting from the first right up to the end of his life that the cultural elements belonged to true men and the skulls to great apes; (2) that the evidence was not given in a straightforward manner, and even involved serious suppressions; (3) that, in consequence of certain intensive special pleading (e.g. that of Sir Grafton Elliot Smith), all the books published since the death of Dr. Davidson Black in 1934 contain quite erroneous information.

Regarding the Australopithecinae, some of Mr. Dewar's contentions are strongly supported by the views expressed by Prof S. Zuckerman, M.D., D.Sc., F.R.S., in the collective work entitled *Evolution as a Process*. No one

interested should miss this clear and well-documented statement—a reversal of the opinions so hastily expressed by the finders of the fossils and other writers before definite data became available.

Lt.-Col. L. MERSON DAVIES wrote: Mr. Dewar's paper affords an excellent summing-up of facts which few people realize, regarding the conflicting nature of current ideas about man's supposed evolution. Not only is this disagreement among evolutionists themselves a glaring fact, but their disinclination to face criticisms by opponents of evolution is equally marked.

Thus Mr. Dewar recalls how the late Dr. Broom made no attempt to controvert my demonstration, before the Royal Society of Edinburgh which he was addressing, that his own cast of the skull of *Plesianthropus* showed features which no ancestor of man could ever have possessed. Similarly, Professor Le Gros Clark, when giving the course of lectures (to which Mr. Dewar refers in his Conclusion) on " The Palaeontology of the Primates and the Problem of Human Ancestry ", never opened matters to questions or comments by his audience. After the close of his last lecture (on the 14th of May) I followed the Professor out of the room and told him that I, as a geologist (which he is not), disagreed with some of his statements regarding the " Palaeontology " of the Primates, since fossil remains of true men far antedate those of creatures which he represented as probably ancestral to man. He did not attempt to justify his omission even to mention these early human remains.

This is typical. Professor D. M. S. Watson behaved in the same way ten years ago, as shown in Mr. Dewar's and my pamphlet *Evolutionists Under Fire*, a copy of which I sent to the President and Council of the Geological Society of London. Neither Watson himself, nor any other evolutionary propagandist, has ever attempted to answer our criticisms of that gentleman's broadcasts.

Sir ARTHUR KEITH wrote: I am sorry I cannot be present at Mr. Dewar's paper, but I am sure that anthropologists will give their attention to anything new he has to say about Man's early history.

Professor F. WOOD JONES wrote: I notice that on p. 2 Mr. Dewar gives a quotation from some writing of mine. I am not disputing the ascription of the dictum to me; but certainly it finds no place in the work and page given as reference for it.

AUTHOR'S REPLY

I am greatly impressed by the research work of the Chairman, as I have had the privilege of reading the manuscript in which he adduces very many facts in support of his conclusion that the theory of evolution violates all the

basic laws of the universe. I hope that the heavy cost of printing his manuscript and reproducing its many illustrations and diagrams will not prevent the early publication of the book.

I am grateful to Professor Zeuner for his interesting remarks. I would ask if he is not going too far in asserting that Science knows little of the origin of man. I submit that all the known fossils tell us is that man is a comparatively late arrival on earth, that formerly men and apes were more diversified than they are to-day, that some extinct apes seem anatomically to be less far removed from man than are existing apes. But I submit that no anthropologist is able to point to any known fossil and say of it that, while non-human, it is almost certainly ancestral to *Homo sapiens*. I submit that the theory of man's animal origin is founded on philosophical considerations rather than on scientific facts. I contend that the evidence adduced in support of it could not sustain it in a Court of Law if it were contested by a man who does not accept the theory.

This applies *a fortiori* to the wider theory that all living organisms are descended from a common ancestor. The only direct witnesses—the fossils—are dead against it. Quite the most striking feature of the geological record is the abrupt appearance, in the rocks of the Cambrian period, of hundreds of thousands of undoubted fossils of marine organisms, representing all the great animal phyla except, possibly, the vertebrata. Prolonged search among the earlier rocks has failed to reveal a single *undisputed* fossil. A few enthusiasts have recorded what they believe to be fossils in these early rocks. I have considered all these and have given reasons in my paper, " The Earliest Known Animals " (*Trans. V.I.*, 1948), why every one of them should be rejected, because it is either not a fossil or is not Pre-Cambrian. This includes *Xenusion*, of which a drawing is given in Zeuner's *Dating the Past*.

The second striking feature of the geological record is that it has not yielded a single fossil really vital to the evolution theory, i.e. a fossil which is clearly a link between any of the great groups that constitute the animal and the vegetable kingdoms—orders, classes and phyla. I doubt whether it is possible to adduce a series of fossils rendering it almost certain that any member of a family is descended from a member of another family. Even if one of the much-paraded series of fossils purporting to prove that the horse of to-day, *Equus*, is derived from the little *Eohippus* of the Eocene be correct, this would merely prove evolution within the family—the horse family.

There is no getting away from the fact that from the point of view of the evolutionist, to quote D'Arcy Thompson, " all attempts to trace the descent of the animal kingdom, fourscore years of the study of the origin of species, has had an unlooked for disappointing result . . . has not taught us how birds descended from reptiles, mammals from other quadrupeds, quadrupeds from fishes, nor vertebrates from the invertebrate stock. The invertebrates themselves involve the self-same difficulties, so that we do not know the origin of the echinoderms, of the molluscs, of the coelenterates, nor of one group of protozoans from another " (*On Growth and Form* [1942], p. 102).

I respectfully submit that the views expressed by Professor Zeuner regarding the evolution of man are guesses which involve impossible or miraculous transformations. As to his saying the fact of evolution can only be denied with difficulty, in my view it is impossible to prove the evolution theory and it should be very difficult to get any one to accept it. As to discussing the causes of evolution, it seems to me that such a discussion would be premature, because it is very doubtful whether evolution, as apart from mere differentiation, has taken place.

Miss Vera Barclay's contribution to this discussion accords well with my view that it is perhaps no exaggeration to assert that correct observation ceased with the advent of Darwinism, because, when observed through Darwinian spectacles, animals and plants are distorted to bring them into line with the theory of evolution. I am glad that she is investigating the various accounts of the finds at Chou Kou Tien, which have resulted in the promotion of *Sinanthropus*, which, like Pithecanthropus of Java, was until 1937 deemed to be a " toolless and fireless creature ", to the status of a man who had an advanced culture and was a cannibal.

I endorse what Col. Davies says about the reluctance of many evolutionists to meet the criticisms of the opponents of evolution. This is not surprising, because, for the past seventy years, textbooks and popular books on biology have treated the theory of organic evolution as an established fact and have set forth and emphasized such facts as are favourable to it, and passed over in silence all that are against it. Moreover, the authors of some of these books are fanatical transformists who have gone out of their way to denounce all who dare to criticize their doctrine as perverse or ignorant people. Outstanding among such is Dr. G. G. Simpson, who made the following assertions in his Terry Lecture, published by the Oxford University Press in 1950 under the title *The Meaning of Evolution:* " It is not many years since J. A. Thomson wrote on essentially the same subject as that of the present volume . . . Thomson felt constrained to devote a considerable part of his work to presentation of proof of the truth of evolution. This would be a waste of time now. Ample proof has been repeatedly presented and is available to anyone who really wants to know the truth. It is a human peculiarity, occasionally endearing but more often maddening, that no amount of proof suffices to convice those who simply do not want to know or to accept the truth. . . . In the present study the factual truth of organic evolution is taken as established and the enquiry goes on from there " (p. 6). It is not surprising that those who have been subjected to this kind of instruction speak of " the fact of evolution" as Professor Zeuner does in his contribution to this discussion.

I agree with Dr. White that some of the theories of the origin of man are founded on fantastic conceptions and most of them are mutually contradictory. We can but sympathize with the many anthropologists who are convinced that man gradually evolved from some non-human ancestor. Many of these feel impelled to try to discover the nature of this ancestor, and in consequence, thousands of hours have been expended in searching the rocks for fossils of

this hypothetical ancestor, and whenever a searcher comes upon a skull, a jaw, a bone or even a tooth which he thinks may have formed part of this ancestor, he expends hours in describing it and trying to fit it into one of the many suggested pedigrees of man, and, if he cannot succeed, in concocting a new pedigree. The results of all this cogitation are made public in the form of papers written for scientific bodies, articles for the press and even books with the object of sustaining the claim of such a fossil to be an ancestor of man. Already such writings constitute a mass of literature so great that any reader would find it impossible to peruse all of them during a lifetime lasting half a century.

In reply to Professor Wood Jones, I regret that a slight error has crept into my quotation from his *Hallmarks of Mankind* (1949). This was from page 79 and runs: " The human orthograde bipedal habit and posture . . . was an aromorphosis in its own right, an achievement of primary importance, since it was not the product of the other human characters; it was the initiator of them all."

In reply to Mr. Filmer, as far as I can judge from the reports I have seen on *Telanthropus*, enough of its anatomy is known to show that the features cited by Wood Jones are ape-like, rather than human. The chief reasons Robinson has given for thinking it is more human than are the other Australopithecines are that it is less prognathous and the third molar is small. But we must bear in mind that the evolutionist who comes upon the fossil of a new kind of ape seems unable to resist the temptation of imagining that at least one of its characters is more human than in any other ape. This is very pronounced in those who have described the Australopithecine fossils. Recently Ashton and Zuckerman have called attention to this in *The Philosophical Proceedings of the Royal Society* and in *Nature*, as regards the dentition of these creatures, and they mention that Straus and Kern in the U.S.A. do likewise, in the case of the upper arm-bone attributed to *Paranthropus* and the thigh-bone attributed to *Plesianthropus* by Broom.

In reply to Mr. Titterington, I think it probable that the deposits from which the fossils of the Australopithecinae were derived are similar to those described by Prestwich. I doubt if it is possible to assign even an approximate date to any of them. The only way of arriving at a likely guess as to the age of each is to examine the fossils of other mammals found in the vicinity. If most of these belong to species which appear to be extinct, presumably the fossils are ancient. Broom, in *The South African Fossil Ape-Men: The Australopithecinae*, asserts that the fossils found at Taungs near where the skull of Australopithecus was found, belong to fourteen different species all of which are extinct, including two genera of which the fossils found elsewhere were of the Pliocene period. Broom in this book suggests that the Taungs deposit may be Upper or even Middle Pliocene, the Sterkfontein Upper Pliocene, the Kromdrai Lower Pleistocene. Later Broom stated in *Finding the Missing Link* that he was inclined to regard the Makapan deposit as older and the Swartkranz as younger than the Sterkfontein deposit, but he adds

" the dating is at present uncertain. Some believe that most of our types are Pleistocene." He wrote (*Life*, March 2nd, 1949) that the giant " *Paranthropus crassidens* might be a million years old ". Le Gros Clark wrote (*Picture Post*, July 1947): " On the basis of the evidence of associated fossils the Australopithecine apes probably lived before the geological period called the Pleistocene. Since this period is estimated to have begun a million years ago, these creatures are then ancient indeed." Some authorities, however, believe that the Pleistocene period began 600,000 years ago.

All the above estimates are largely guess-work. At present there is no known really dependable test of the age of any ancient rock or its fossils. This matter was dealt with by Sir Ambrose Fleming in 1937 (*Trans. V.I.*, 69). More recently A. Knopf wrote (*Genetics, Palaeontology and Evolution* [1949], p. 6): " No secure evidence is yet at hand on the length of any of the periods. We have made only a beginning in establishing absolute geologic time scale."

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RECENT THEORIES OF THE ORIGIN AND NATURE OF THE UNIVERSE

By

W. E. Filmer, B.A.

Discussion

The Chairman (Dr. R. L. F. Boyd) said: I find that as Chairman it is my duty to make a few remarks about this paper which is, as I am sure we all realize, the result of very hard work by Mr. Filmer. First, therefore, let me thank him sincerely on behalf of the members of this Society.

It is important that I should make it clear at the outset that I speak as a layman to cosmology. As a physicist engaged in laboratory research, I have been inclined to regard cosmology as partaking rather of the nature of the arts, and I am bound to say that the recent theories of which Mr. Filmer has spoken have done little to change my opinion.

It may be for that very reason, however, that I find the continuous creation theories quite pleasing. There is an economy of hypothesis and neatness of reasoning about Bondi's and Gold's argument that cosmology is futile except on a basis of the wide cosmological principle, and their demonstration that continuous creation must follow from its adoption. Even Hoyle's less sophisticated argument that continuous creation is aesthetically more acceptable than the " big bang " idea carries some weight—aesthetic weight that is, which is appropriate to the arts. Philosophically the avoidance of particularity in space or time does give the continuous creation theories something to commend them. It would seem too, to a layman like myself, that Gamow's theory is weakened on aesthetic grounds by a return to a kind of neo-pre-Copernicanism. Once again in Gamow's system we find ourselves not far from the centre of the universe—to judge by the symmetry in the distribution of nebulae—and one wonders why we should occupy such a singular position.

Since it seems that we must discuss aesthetic and philosophical questions when talking about continuous creation, I would like to mention one serious objection I have on these grounds to the Bondi, Gold and Hoyle picture. It is its infinitude. One is loth to abandon the finite but unbounded system of Einstein but, if we must do so, it seems hard to put in its place a universe infinite not only in space and time but as regards its material content too. I am speaking here, of course, of the universe we conceive, not the visible universe which is limited by the distance at which the galactic recession velocity is equal to that of light. If we are to think of the universe as having a constant mean density and being infinite both spatially and temporally,

then we must surely expect that any given finite pattern of particles—as for example the pattern that constitutes me and my (visible) universe—must repeat itself elsewhere. In that case are we to assume that there is an infinite series of Victoria Institute meetings identical to this, stretching throughout space and time? Or again since the probability of a thermodynamic freak such as that of a kettle boiling on ice is in principle finite, must we suppose that in an infinite universe there are worlds where kettles always boil on ice and entropy continually decreases?

Here, I know, I am on dangerous ground, talking about infinities—ground sacred to the foot of the pure mathematician. Perhaps I have rushed in where even he would fear to tread, but I may have served to show that the picture of a universe infinite in age and extent is not entirely restful to the mind—to my mind at least. Perhaps after all the reverberations of the " big bang " are less disturbing than the nightmare of a super dead star infinitely old and grown infinitely large by stellar accretion.

All this, however, is philosophical speculation and I think Mr. Filmer has done us a real service by drawing our attention to some of Professor Dingle's remarks in his address to the Royal Astronomical Society. At present continuous creation is a brilliant speculation but the arguments upon which it is based are rather like the classical proofs of the existence of God. They convince only the converted.

But it is time I left this cosmical phantasia and returned to physics. Fortunately, observation rather than speculation should enable us, sooner or later, to eliminate Gamow or Hoyle or even perhaps—not to say probably—both. Indeed, as Mr. Filmer has shown, if the Stebbings-Whitford results are finally accepted, a major plank will have been knocked from continuous creation's present platform. I believe that as more data are gathered concerning the distribution of the extra-galactic nebulae—perhaps by that young and flourishing research, radio-astronomy—it will be possible to distinguish between Gamow's system, which presumably gives the distribution a density gradient, and Hoyle's, which is uniform.

It is the primary concern of this Society, however, to consider the relationship between Science and our Faith. For my own part I find it difficult to find any close connection between cosmology and my faith unless it be as a motive to worship. Mr. Filmer says that Hoyle " reduces the Creator to the status of an automatic machine for the production of hydrogen atoms ". This may be true of Mr. Hoyle but it certainly is not true of his theory. His theory says nothing about the Creator's status, neither is it within the competence or province of any scientific theory to do so. If we concede this of Hoyle's theory then we must say of Gamow's that " it reduces the Creator to the status of a device for producing neutrons once for all in a ' big bang '."

The crux of the relationship between cosmology and faith—such as it is—does not lie in the " How " of the universe at all but in the " Why ".

Even the Genesis account, which I take to give the story of the development by God of man's little world very much from his own point of view as a

denizen of the earth, is after all primarilly concerned with meaning rather than mechanism; with God's purpose, that is, to make a creature in His own image to enjoy both His creation and Himself.

Written Communications

Professor W. H. McCrea, F.R.S., wrote: When I was invited to comment upon this paper my first reaction was to decline because public controversy over such matters is in general quite fruitless. However, on second thoughts, I feel bound to write to indicate as briefly as possible why I believe the paper to misrepresent the scientific situation and the work of certain of the scientists mentioned.

The problem of the " origin " of the universe is not only unsolved at the present time but I doubt whether it can yet be even formulated in a scientifically meaningful way. However, it does seem to be meaningful to enquire if a coherent account of the large-scale properties of the observable universe can be given in terms of a steady-state theory. If not, it would be *natural* to enquire whether an account can be given in terms of evolution from a quite different state, although it is not certain *a priori* that we should be in a position to do this. For it would involve the concept of " cosmic time ", which is ill-understood, and it would, at any rate implicitly, require knowledge of the dependence of the inertial and electromagnetic properties of matter upon the behaviour of other matter. Such knowledge we cannot yet claim to possess.

Mr. Filmer does not show that he is aware of these " philosophical " difficulties, although he has a section on " Philosophical Arguments ". In my own paper to the Institute in 1951, I explicitly refrained from discussing them.

Instead of calling attention to the real and known philosophical difficulties, Mr. Filmer concludes his section under this heading with the assertion that " These theological implications are evidently Hoyle's real difficulty ". This is grossly unjustified. Neither here nor elsewhere in his paper does Mr. Filmer refer to the two technical papers, *Monthly Notices, R.A.S.* **108** [1948] 372; **109** [1949] 365, in which Hoyle stated his views on the cosmological problem.

As regards the " ordinary " scientific treatment, Mr. Filmer's survey of the evidence is comprehensive. But to anyone conversant with the subject, his account can be seen to include a good deal of special pleading. I take some instances in the order in which they occur in his treatment. On pp. 20–21 he concludes from the alleged behaviour of star clusters and of double stars that our galaxy cannot be older than a certain age, while on p. 29 he has to entertain the idea that certain stars are being continually (" continuously ") replaced by new stars. Obviously he cannot have both arguments without a good deal of further examination. Although it has been predicted that " in the course of time pairs of stars . . . would become more widely separated " (p. 21), such evidence as I have examined appears to favour the opposite conclusion.

On p. 23, Mr. Filmer quotes Gamow as calculating that the amount of matter in each cloud would be enough to form several million stars the size of the sun. Mr. Filmer admits that this is " not quite as great as the number of stars in the existing galaxies ". The number of solar masses in our own galaxy is estimated to be about 100,000 million! The expectation that when " other factors have been taken into account, the figures will agree " has yet to be substantiated. Actually it is well-known that the problem of the origin of the galaxies is one of the major difficulties of theories of this class. In the face of this difficulty, it is ludicrous to base any conclusion on the assertion that " the variation [in size] is not greater than it might have been by accident had they all been formed at the same time " (p. 27).

Concerning the abundances of the chemical elements, the trend of evidence is at present against the views on p. 26. For several years past, evidence has been accumulating which shows that the stars of the so-called Population I apparently contain a larger proportion of metal atoms than do the stars of Population II. This has been interpreted as showing " that a large fraction of the amount of metals now found in the Galaxy may actually have been produced since the first stars were formed " (M. Schwarzchild and L. Spitzer, *Observatory*, **73** [1953] 77). Thus the argument about " cooking facilities " (p. 26) operates the opposite way from that suggested; if we find evidence that the (perhaps *not* inexperienced) housewife has done her own cooking we do not have to postulate that everything was cooked for her before she got it.

As a matter of fact, the authors just quoted do nevertheless consider that the difficulties offered by an exploding universe are less than those of a steady-state universe. In particular, they cite the work of Stebbins and Whitford (and more recent observations) in much the way that Mr. Filmer does on pp. 27–29. But there are other astronomers who consider that these undoubtedly important observations require a different interpretation.

Mr. Filmer writes about Hoyle's work (p. 29 and Synopsis) as though this work includes a postulate about " a cosmic force of repulsion ". This is not so, as can easily be verified by referring to Hoyle's original papers quoted above.

On p. 32 Mr. Filmer implies that the second law of thermodynamics can be applied to the universe as a whole. Even if the universe is " running down " like a clock, this cannot legitimately be inferred from standard thermodynamical theory (see E. A. Milne, *Modern Cosmology and the Christian Idea of God* [1952], Ch. X).

The situation is that there is no agreed solution to any major problem of cosmic evolution, let alone to the problem of the evolution of the universe as a whole. Many scientists would say that it is too soon to expect solutions to these problems and that we ought not to try to attack them directly. However, we cannot help wondering about them and it is probably valuable that from time to time a survey should be made of the possibilities of progress based upon the existing state of knowledge. But it is valuable only if it reveals the difficulties still to be overcome. I regret to find that Mr. Filmer's review fails to recognize some of the best-known of these difficulties.

Professor C. A. COULSON, F.R.S., wrote: There are two considerations that we should always keep in the forefront of our minds when thinking about modern problems of cosmology. They are both implicit in Mr. Filmer's paper, but it may be worth mentioning them explicitly.

The first of these is the extent to which the imagination has to play its part in any such account. We cannot visit the outer regions of space to touch and handle what we may find there: nor can we wander backwards in time to see with our eyes what was happening millions of years ago. As Eddington pointed out very clearly, even the astronomer's statement that there is a star in a particular position in the sky only has meaning if we assent to some kind of imaginative theory of the nature of outer space. To some extent this is true of all science; and perhaps Mr. Filmer might have worded his remark on p. 20 that " the only force of which we have definite knowledge acting on the galaxies is that of gravity " a little less dogmatically; for gravity itself is a concept that we ourselves introduce (with great success, of course) to make sense of the fact that apples fall from trees, and stones from leaning towers, independently of who drops them or who may be beneath. This central role of the imagination in cosmology provides the justification for the many diverse differences in the views of the experts. In hardly any other problem of science is there so wide a divergence of opinion as here. The case of the temperature of space (1° in the scheme of Hoyle, 40° in the scheme of Gamow) is mentioned in Mr. Filmer's paper. Some of these differences are by their very nature incapable of direct settlement. It may eventually be possible to devise experiments which will give us a pretty good indication of the temperature of interstellar space, and so settle this difference between Hoyle and Gamow; but it is exceedingly unlikely that we shall ever be able to detect the creation of an isolated atom of hydrogen in a medium-sized room in a century. This situation warns us against placing too much confidence in any particular theory or conclusion. For a new use of the imagination may suggest some alternative explanation, or some new development of technique may widen the field of enquiry very considerably. A most exciting example of this latter situation has just arisen with the development of the science of radio-astronomy. In the last few months it has been shown that there are large masses of material in the universe which emit radiations in the radio wavelength range. Although these radiations are invisible to the eye, they may be detected, and their direction found, by radio methods. One of the most significant results—for our present purposes—is that there are huge streamers of matter connecting some of the galaxies, like filaments. Such filaments would possibly never have been detected with visible radiation; although their full significance cannot yet be assessed, it is clear that they may profoundly affect our views about the generation and life history of the galaxies.

The second of the two considerations that I wanted to emphasize is related to the first; it is that underlying all the various models of the universe that have been proposed, and independent of their differences from each other,

lies the firm conviction that the universe can be understood in rational terms; that there is an " order and constancy " in nature which extends beyond our own earthly boundaries. In one sense it is true that no sensible or meaningful statement can be made about the universe except in terms that presuppose this uniformity, or principle of uniformity, both in time and in space. But Whitehead's words are just as true today as when he first used them; the growth of science is a derivative from the Jewish insistence on the personal energy of a one-God, and the Greek sense of the rationality of things. Nowhere is this more surely shown than in discussions of cosmology. Perhaps this is why Einstein said that more parsons were interested in relativity and cosmology than were any other group of people!

Mr. JOHN BYRT wrote: I find Mr. Filmer's paper an admirable summary of the rival hypotheses of Hoyle and Gamow, which are fairly typical of the two main schools of cosmological thought today. Under the heading of " Philosophical Arguments ", it could be mentioned that the only real claim of Hoyle's theory to be philosophically satisfying is its simplicity: as Prof. McCrea wrote in his paper in 1951, " It does appear that the creation theory can in principle predict effectively all the properties of the astronomical universe from exceedingly simple premises." But even this simplicity may be more apparent than real, if we accept the view of E. A. Milne (*Modern Cosmology and the Christian Idea of God*, 1952) that " there would have to be a fore-created space in which the creation of matter could take place; and there would exist a constant, namely the rate of creation of such matter, which would not be rationally accounted for."

Without being at all dogmatic, I rather query Mr. Filmer's statement that " the conception of a beginning when God created the heavens and the earth (or space and matter) out of nothing, was of purely Hebrew origin " (p. 32). Certainly this is almost universally accepted by Christian theologians, but to me it savours more of Greek philosophy than of Old Testament teaching. The same word *bārā* which could imply creation out of nothing in Gen. 1: 1 is used in v. 27 of the creation of man who, we are told, was " formed of the dust of the ground ". The nearest we are granted to a mechanism of the creative process would appear to be Psa. 104: 30, " Thou sendest forth thy spirit, they are created: and Thou renewest the face of the earth." The Holy Spirit might constitute the agency, or power through which the Father acts and could thus, I suggest, without irreverence be thought of as a personification of (Divine) Energy. The interconvertibility of energy and matter being now well recognized, it follows that the matter of the whole universe can be considered as part of, and originating in, the eternal Spirit of God. The apparent conflict between the ideas of immanence and transcendence would then disappear, God being both immanent in and transcendent to the world. The thought is necessarily vague; I claim only that it is consistent with Heb. 11: 3, " things which are seen were not made of things which do appear "; and that

it lends fresh point to Paul's words to the Athenians: " In Him we live, and move, and have our being ".

Author's Reply

It appears that Dr. Boyd's preference for Hoyle's universe is founded on a preference for an infinite rather than a finite universe. Gamow's " big bang theory " may be applied to either, and he prefers the idea of its being infinite. He says, " The fact that material occupying an infinite space can be squeezed or expanded and still occupy the same infinite space is one of the so-called ' paradoxes of infinity '." As an illustration, imagine a hotel with an infinite number of rooms all occupied; when an infinite number of new customers arrive, the room clerk instructs the occupant of room one to move into room two, the occupant of two into four, the occupant of three into six, and so on. That leaves an infinite number of odd-numbered rooms vacant for the infinite number of new customers.

If Dr. Boyd still dislikes the infinite material content of such a universe, there is nothing in Gamow's theory incompatible with Einstein's idea that it is finite, curved but unbounded: Gamow discusses the possibility (pp. 36–38, *op. cit.*) but is not prepared to commit himself until the curvature has been demonstrated in a thinning out of galaxies at great distances. In either case there is nothing in Gamow's theory to suggest that any one place in the universe can be singled out as the centre, or that we occupy any unique position in it.

Prof. McCrea draws attention to some difficulties and anomalies with which I did not deal, partly on account of lack of space, and partly for the sake of simplicity. It would be quite wrong to suppose that any theory is at present able to cover all the facts. He implies that I am contradicting myself when I say on the one hand that our galaxy cannot be older than a certain age, and on the other that stars are still being formed. There is no contradiction; the age of the galaxy may be said to date from the time when it became a separate entity, but all the matter in it may not have formed into stars immediately, and new stars may continue to form so long as there remains enough interstellar gas to provide the material; it is, in fact, believed that there is still enough gas left in our galaxy to form as many new stars as already exist. In stating (p. 21) that pairs of stars become more widely separated in course of time, I was quoting what Prof. Coulson said in his broadcast, and other authorities agree on this point (e.g. Payne-Gaposchkin, *Stars in the Making*, [1953], pp. 50–51). Perhaps Prof. McCrea may be referring to a recent analysis which has shewn that pairs of stars cannot be formed by fission from a single large star.

It is true that Hoyle seeks to eliminate the cosmical constant from the equations he gives in the two papers to which Prof. McCrea refers, but this does not alter the fact that in Hoyle's universe the galaxies appear to accelerate

so that the velocity at a given time is proportional to the distance from an observer. Thus he says (*Monthly Notices, R.A.S.*, **108,** [1948], p. 379): "A light source moving along a geodesic through 0 has an apparent recessional velocity at time t given by multiplying the absolute distance, at time t, between the source and the observer by the constant c/a" (where c=velocity of light; a=radius of observable universe). In Newtonian mechanics a body moves with uniform velocity unless it is acted upon by a force, so it follows that if the galaxies are accelerating it is necessary to introduce the conception of a force of cosmic repulsion to account for it. It is true, as Prof. Coulson points out in his remarks, that this force, as also that of gravity, are conceptual, and are introduced in order to make sense of observed accelerations.

Mr. Byrt queries my statement that the idea of the creation of matter out of nothing is of Hebrew origin. In *Miracle and Natural Law*, Chap. 3, Robert M. Grant provides the evidence for this by giving the views of most of the ancient philosophers on this question. A single example must suffice here: "We know that Hierocles was closely related to such Christian philosophers as Aeneas of Gaza, and his adoption of *ex niliho* creation must reflect their teaching. No other Greek philosopher accepted it" (p. 39).

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THE VALUE OF RELIGIOUS INSTRUCTION IN EDUCATION

By

E. W. CRABB, DIP.LITT., DIP.TH.

DISCUSSION

THE CHAIRMAN (J. R. HILL, Esq.) said: There must be many folk the world over who know about the Victoria Institute, and who have heard of its valuable contribution to Christian thinking and of its valiant defence of Christian truth down the years; they have heard of these things and have heard reports of these meetings but, like me, have usually found it quite impossible to attend personally. The will was present with them, but how to perform they knew not. I feel it an honour to be here as chairman.

Mr. Crabb holds the Diplomas of Literature and Theology of London University and he is at present the Headmaster of the Stanmore School, Stanmore, Middlesex. I feel I must congratulate you, Ladies and Gentlemen, on your choice of subject and speaker. In the forging of a nation and moulding of its history, there can be no more matter of fundamental importance than the education of the young; and to stimulate and direct your thinking on this subject it would be very difficult indeed to find anyone more suited than Mr. Crabb. He is now enjoying—and I hope the word is correct both for himself, his staff and his pupils—he is now enjoying his second Headmastership under the Middlesex Authority; and he has written a number of Scripture text-books for a well-known firm of educational publishers.

Besides his work in day schools he has been very active in various fields of Christian activity. I believe he is a member of the Council of the Covenanter Movement, for instance, and has often acted as Commandant at various Boys' Camps. In my own field of Sunday School work he has often contributed articles about the various aspects of teaching and has just now finished a complete re-writing of a Teachers' Correspondence Course.

All this seems to me to add up to a most suitable list of qualifications for anyone to speak to you on " The Value of Religious Instruction in Education". I am sure you will agree with me that Mr. Crabb deserves our warm thanks for this compact survey over the whole of the historical aspect of our subject. He has dealt with the possibilities of Christian education in the State system, the limits of it, and the problems that arise in practice.

I do not propose to insult your intelligence by going over all that Mr. Crabb said. All I want to do now is to suggest a certain order for our discussion. I think it falls pretty obviously into two parts. We might very well discuss first the possibilities in the present system. We have seen its possibilities; do we agree that they are realized, or even, in view of everything that Mr. Crabb

has said, that they are realizable? He spoke of the " acquaintance with the Bible " which has been put as one of the aims of religious education and has called that " rather cool ". We may well ask and may very well discuss how much more than that is actually possible. Are we to be reconciled to this typical English compromise? That would be one part of the discussion; and, that settled, we might well go on to the second part: What is to be said about the alternative? For example, in the United States many Christian folk feel that religion is well banned from the secular day schools and prefer that it should be taught in separate private day schools run on a definitely Christian basis—which, of course, is exactly the outlook of the Roman Catholics in this country. In such schools there can be realized what Mr. Crabb pointed out, that true Christian education which is possible only when every subject in the syllabus is taught from the Christian standpoint.

Mr. W. E. FILMER said: I am sure we are all grateful to Mr. Crabb for his admirable paper. I was glad to notice his remarks about the harmful tension in the minds of scholars caused by the teaching of materialistic science and philosophy. Certain teachers' organizations have set up a body known as the British Social Biology Council which has published literature for teachers on science and religion and held conferences on the subject.

One such conference was held in London in March 1952 and was ostensibly for the purpose of showing how to correlate the teaching of evolution and religion. It was stated from the platform that the early chapters of Genesis could not be accepted as having any foundation in scientific or historical fact, that since man has evolved from animals no such persons as Adam and Eve ever existed and that the story of the Fall of man in Genesis 3 was a myth. In answer to questions it was further stated that St. Paul's references to Adam in Romans 5, I Corinthians 15 and I Timothy 2 proved that he was misguided in his presentation of the doctrine of original sin, and that our Lord's reference to the creation of man in Matthew 19: 4 clearly showed that his knowledge was limited to the generally accepted beliefs and prejudices of his time.

Later, when a Church of England minister offered to show how the first two chapters of Genesis agreed with the findings of modern science, he was given no hearing and his offer was refused by a large majority after being put to the vote.

The British Social Biology Council which was responsible for this conference is sponsored by all the leading teachers' organizations, including The National Union of Teachers, The Headmasters' Conference, The Science Masters' Association, the various Associations representing the Assistant Masters and Mistresses in Secondary Schools, the Teachers in Colleges and Departments of Education, Teachers in Technical Institutions and sundry other educational organizations.

It appears, therefore, that the teaching profession as a whole has agreed to teach a religion which differs in certain fundamental respects from Scriptural

Christianity and which is incompatible with the Christian Faith taught in Evangelical Churches. This must inevitably produce harmful tension in the minds of many children, and it is time that teachers who appear to have so little understanding of true Christianity should cease to interfere in the teaching of the subject and leave it in the hands of those who do.

Dr. WHITE said: I should like to thank Mr. Crabb for the very thoughtful paper he has written, and for the lucid way in which he has written it. His address today, based on his paper, was, if possible, even better.

There are two points which occur to me in connection with religious instruction in our schools.

First of all the need for Christian teachers to teach the Bible. As things are at present, religious instruction may be in the hands of teachers who are themselves unbelievers, and even opposed to Christian teaching. It is very difficult to see how this could be remedied without the introduction of religious tests. In theory the Church of England and the Roman Church are right in their demands that religious instruction should be given by members of the Church, but in practice this is difficult to carry out in schools supported by the Government and local councils. Some of us are old enough to remember the trouble there was at the beginning of this century over the Balfour Act which brought the Church schools on to the rates. We remember the Passive Resistance movement set in motion by the Nonconformists as a protest against public money being spent for the benefit of Church of England teaching. It is a very difficult problem. One thing already being done is that more Christian teachers are taking degrees or diplomas in theology, thereby qualifying themselves to teach religion as specialists. There is a great need for young Christians—men and women—to be encouraged to take up teaching as a vocation.

The other point is the need for a supply of good theological literature, especially for the use of fifth and sixth forms.

When my younger boy was at a public school, he showed me a book on the Old Testament which was used as a text-book in the sixth form. It was full of destructive critical teaching. For example, it explained the fire from heaven which descended on the altar on Mount Carmel in answer to Elijah's prayer by saying that there was a certain kind of wood growing in Syria, which had the property of catching fire when the water was thrown on it. Elijah, knowing this, had obtained some of it to put on the altar; hence the fire after plenty of water had been thrown on the altar. Rationalistic and destructive critical teaching is rife in some of our schools, and we need both sound Christian men and sound Christian books if our boys and girls are to be taught the faith once for all delivered to the saints.

Another alternative would be to cut out Bible teaching altogether from the schools and leave religious instruction in the hands of the churches outside school hours. If this were done it is to be feared that more children than ever would grow up in complete ignorance of the Bible.

Mr. M. W. TONGE said: In most Primary Schools, the children have a Scripture lesson every day, so that the lesson assumes the same importance, in the child's mind, as that attached to the other *daily* lessons.

However, when the children enter the Secondary School immediately the number of Scripture periods falls from five to one or two. I am certain that the child takes the attitude: " Well, Scripture can't be *important* because we don't have it as much now," and so the wrong impression is created on the child's mind right at the start of his secondary career.

Dr. C. E. A. TURNER said: Mr. Crabb is to be congratulated on the production of a lucid, informative paper, displaying a breadth and depth of vision which demands that religious instruction is essential to a true education.

As well as Christianity being influential in the popular education dating from the charity schools of the eighteenth century or earlier, it is a wonderful fact that religious instruction has always been present in English education. This may be seen in the work of Augustine, King Alfred, the schools of the Middle Ages and more recent foundations. It is therefore part of the English tradition and a great heritage that the Christian religion is taught in our schools.

Education tends to reflect the life of the nation, which supplies its teachers, elects its education committees and contains parents whose desires for their children are often expressed. This means, however, that in the present situation, the definite Christian influence is likely to be exercised by a minority in the schools.

There is also the influence of the leaders of educational thought and practice. These are largely drawn from the universities, which have now lost the ancient tradition of preparing men for the study of theology as " the queen of the sciences ".

The problem therefore is that the inclusion of religious instruction in school education will allow it to be directed, written about by authors of text books and given by the unconvinced. This is an obvious danger. The situation, however, does allow the keen Christian to become a head teacher or Scripture specialist and bring an enthusiasm and sincerity with divine help to the work, which the unbeliever will not possess on the contrary side.

This underlines the importance of Mr. Crabb's statement of the need for increasing the number of really convinced Christians to teach in homes, churches and schools. Christian teachers of any subject can help to restore the integration of education and life through that interpretation in which Jesus Christ is known as Creator, Lord and Saviour.

Personal experience in a grammar school has shown the value of the religious instruction given in homes, churches and primary schools. This influence on young impressionable children is not lost and the fact should be a heartening thought for workers in these spheres.

MR. B. C. MARTIN said: In Mr. Crabb's very able and interesting paper he refers to " the problem of tension in the minds of scholars . . . when the student is aware of contradictory attitudes " (p. 40). But is this a necessary problem? Must there be " contradictory attitudes " *expressed* by different teachers in the same school?

Surely it is inimical to education that a school should speak with several voices. The very idea of learning would seem to be undermined if something taught in one class is going to be flatly contradicted in another. Might this not have the deplorable result of bringing into contempt all knowledge imparted by teaching?

It seems that the laudable aims of the framers of the 1944 Act, as regards Religious Education, may be largely defeated unless there are safeguards introduced to eliminate this contradiction. Those aims are stated to be that " children shall have a grounding in the principles of the Christian Faith "—but this cannot be brought about by allowing the foundation to wobble in a welter of " contradictory attitudes ".

A scholar hears enough opinions on religion outside school: in school he should hear the conservative tradition, and that alone.

All subjects are taught from text-books and one would think that for Christian Instruction the Bible is the obvious and authorative text-book.

Safeguards I would like to see would be (1) that teachers of " Religious Instruction " should be required to teach the conservative tradition based on the Bible; (2) that teachers of other subjects should be restrained from intruding into the sphere covered by " Religious Instruction ".

Mr. NORMAN HOLLOWAY said: (1) A comment on the statement (p. 102) that untruths had been expounded by the British Social Biology Council Society, supported by the N.U.T.

The N.U.T. is affiliated to this, among many other organizations, but the rank and file member pays no attention whatsoever, during Union meetings, to such opinion.

(2) Could some sort of test be imposed, whereby the unbelievers would be kept out?

(*a*) Such tests are tried occasionally, e.g. for a post in a Church of England school. The unbeliever can get by every time.

(*b*) The proportion of Born Again Christians is as low in the teaching profession as elsewhere. It would be impossible to staff schools if all unbelievers were excluded.

(3) A question: ought the " Lord's Prayer " to be said in school assembly? There is the possibility that we are, unconsciously, giving the children a false impression, e.g. that " saying prayers " is praying, i.e. on a par with the " recitation " lesson.

Mr. A. R. CHISHOLM said: I should like to draw attention to one aspect of religious instruction which has perhaps been overlooked. My own experience has been that in the hands of anyone but a convinced Christian the provisions of the 1944 Act are of very little use and I should like, therefore, to mention those voluntary organizations which are now very strong in Colleges and Universities. These, I have found, are of great use and I feel that the spread of similar Christian Unions in Grammar Schools and Secondary Modern Schools would be of immense value in spreading the Word of God. There is a natural barrier between pupil and teacher and for this reason particularly, the witness of pupil to pupil is likely to be effective. In this way, too, a single Christian teacher could help the spiritual development of pupils he might otherwise not instruct.

WRITTEN COMMUNICATIONS

Dr. H. MARTYN CUNDY wrote: Very lofty ideals are set before us as teachers in this challenging paper. Even the most devoted Christian teachers would scarcely dare to say that they are attaining them, but what is more serious, the vast majority of teachers would not agree with these ideals at all. It has been said by Rowntree and Lavers, in their revealing book *English Life and Leisure:*

" It is not easy, in the absence of proof, to believe that a new syllabus, plus some extra training in religious instruction as ' a subject ', will turn the average run of teachers into evangelists. Their difficulty in giving religious instruction is the same as that encountered by parents. They cannot give what they haven't got. . . . It is extremely difficult to teach religion in the schools, because people who are not certain that their ideas are valid dare not teach them to the young."

It seems to me that here lies the secret of the weakness of Christian education. It is good that more and more people are willing to teach Religious Instruction, but they are not wholeheartedly convinced of the validity of the Christian faith. True Christian teaching must come from a full heart.

I should like also to add a few comments on the matter of Sunday Schools. I think that the statement that " Sunday School instruction today too often errs in confining itself to simple Bible stories " needs at least considerable qualification. My own experience in this matter is supported by the section of Messrs. Rowntree and Lavers' survey dealing with this subject. It is important to distinguish between Anglican and Nonconformist Sunday Schools. It is certainly true of the latter that " the training is concentrated largely on the Scriptures and seems to follow very much the same lines as the agreed syllabuses for the day schools ". It may well be that there could with profit be an increase in the doctrinal content of such teaching. But in Anglican Sunday Schools the position is usually entirely different. To begin with, the teaching is not always given " in premises linked with the church-going of

adults ". It may be in very unsuitable buildings and at least in this area the largest Anglican Sunday School is held in the ordinary class-rooms of the State day school, by special arrangement. The atmosphere of many a parish hall, which fulfils a wide variety of functions, is scarcely conducive to worship. But the instruction given is certainly not confined to Bible stories. Messrs. Rowntree and Lavers say " it is assumed in Church of England Sunday Schools that children obtain elsewhere, mainly in their day schools, all they need to know of the Bible ". Extensive acquaintance with literature provided for Church of England Sunday School teachers leads me to the same conclusion. The instruction is almost entirely in Catechism, the meaning of Church Festivals, practices and worship. There may be lessons on the Life of our Lord, but the Lives of the Saints occupy an almost equally prominent position. Since it hardly needs to be said that the day schools alone, even with the 1944 provisions, do not, with a few honourable exceptions, provide the child with the Bible knowledge it requires, we need look no further for reasons for the doctrinal shakiness and Biblical ignorance of the average church-goer today.

Restoration of the authority of Scripture as the Word of God and dissemination of the content of its teaching is the prerequisite of any revival of spiritual life in this country.

Miss MARY COSTON wrote: I do agree with Mr. Crabb that Bible knowledge is essential to Christian living and Christian living is essential to the life, liberty and pursuit of happiness of all individuals within the commonwealths. Britons do have a marvellous programme of education, including the Bible study in the schools, leading on to Christian fundamental principles in all subjects as science, literature, etc.

The need for Christian workers, Bible teachers, Christian educational directors, missionaries, etc., in the United States has caused Bible Institutes to spring up all over America in this twentieth century. These Institutes are closely affiliated with the Evangelical Teachers Training Association of America. The Moody Bible Institute is the mother school for such training. There are a few colleges that still offer this training.

In these days of growing apostasy, many churches and so-called Christian Colleges and Universities have failed in their Christian training to produce Bible-believing, Bible-loving, Evangelical Christians and Christian workers, but had rather give place to modern false teachings and beliefs.

We know of a few cities and one state that has required Bible teaching in the educational programme for children and young people. As the work of the Bible Institutes and true Christian Colleges and Seminaries has continued, and workers sent forth as evangelists, teachers and real Bible scholars; and as True-to-the-Bible Conferences are being held in many parts of the country; America is without excuse concerning the things of God.

Dr. R. E. HARLOW wrote: I have read, with considerable interest, Mr. E. W. Crabb's paper on " The Value of Religious Instruction in Education " and think that the members of the Institute might be interested in the following comment.

Following the example of Great Britain, the Province of Ontario introduced a programme of religious instruction in the public schools, amounting to one hour per week. The stated purpose of this is to develop moral character and produce better citizens. An excellent graded programme of studies has been prepared for the first six years of the child's life in the public school.

In attempting to evaluate the results of this programme, I have prepared a series of tests, designed to ascertain the relationship, if any, between Bible knowledge and good character. In order to limit the field as much as possible, I investigated only one phase of good character, namely, verbal honesty. The question was, " Do children who are well taught in Bible incidents from which lessons on verbal honesty may be drawn tend to show a stronger attitude about telling the truth? "

After administering a simple test on Bible knowledge, based on such passages, I attempted to ascertain the child's attitude towards honesty in the following ways:

(1) A series of little incidents on the child level (Grade 6), in which a child, for some reason or other, tells an untruth, were evaluated by the children as being very bad, bad, perfectly all right, etc.

(2) A " Guess Who " test was administered, in which the question was asked, " Who in the class is best described as follows? " Imbedded amongst a variety of descriptions of outstanding persons were four on the subject of honesty or dishonesty.

(3) The teachers were asked to rate the members of the class on their attitudes of honesty.

The first of these was administered ostensibly in an anonymous fashion and the whole programme given to 336 boys and girls of Grade 6 of eight urban schools in Toronto. In every case the results were not significantly different from zero, excepting that there was a small correlation between the teacher's ratings and the pupil's Bible knowledge.

I concluded that the way Religion is taught within the schools of Ontario, within the limits of this very narrow field, attitudes of honesty are not being cultivated in the pupils. I would, therefore, completely agree with Mr. Crabb in his proposal that this subject should be put into the hands of specialists and, if truly Christian teachers would volunteer for this work, great results might follow.

AUTHOR'S REPLY

The main problem which has impressed itself on the minds of those contributing so ably to the discussion on my paper is the difficulty of ensuring that convinced Christians should be responsible for the teaching of Religious

Instruction. Most are agreed that half a loaf is better than no bread, and it is a matter for praise that so much is being done. The need for more Christian teachers is great and Christians have the remedy for the situation in their hands. Sectional interests will always take an extreme line and Mr. Filmer has underlined the activities of one such. The influence of rationalism on Religious Instruction is as effective as it is numerically strong. The schools are bound to be a reflection of the pattern of adult thinking in any generation, although the influence of convinced Christians honestly teaching the syllabus will be out of all proportion to their numbers.

Mr. Tonge's problem over the falling number of periods in Scripture at the Secondary stage can be partly offset by reminding the child that other subjects have also suffered at this stage as the curriculum is increased by additional subjects. There are also fewer English and Arithmetic periods to allow room for languages and technical and practical subjects.

Mr. Martin's wish for a safeguarding clause defining Religious Instruction as being of a conservative nature would not fall within the structure of the 1944 Act, and, as Mr. Holloway notes, tests of any kind are usually ineffective. It is, indeed, to be deplored that remarks are made in other subjects which are irrelevant to the matter in hand and yet which attack the faith of a child, but most people would shrink from the imposition of any religious tests. The most effective way is the use of the liberty which is granted, by those able to do so.

Mr. Chisholm's remarks about the value of voluntary external Christian fellowships are important as they allow a freedom and a directness of approach which cannot come in the formal lesson. Experience suggests, however, that in Secondary Modern Schools with fewer older scholars there is a need for the guidance of a Christian teacher whose sphere is thus enlarged as suggested by the comment.

Dr. Cundy's remarks are important in underlining the main problem inherent in Religious Instruction, the conviction or lack of conviction of the teacher. His remarks on Church of England Sunday schools show a development very different from that envisaged in the paper, where the plea was made for more Bible-based doctrinal teaching. Miss Coston's comment on the position in the United States illustrates the solution reached by those in America who are troubled about the position of Religious Instruction in the educational system, whilst Dr. Harlow's letter underlines the need for the linking of theory with practice if true value is to be obtained from the knowledge of the Word of God imparted to our children.

The response to the subject of the paper indicates the vital interest which thinking people are attaching to the Christian education of the young, and in that interest lies the greatest hope for the future.

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THE BIBLE AND CURRENT THEORIES ABOUT LANGUAGE

By

PROFESSOR MALCOLM GUTHRIE, PH.D., B.SC., A.R.S.M.

DISCUSSION

THE CHAIRMAN (Mr. D. J. WISEMAN), in thanking Professor Guthrie for his stimulating paper and for the additional illustrations and explanations of it which he gave, said: I am not qualified to make much comment on this excellent survey of recent theories of language in their relation to the Bible, but may perhaps be allowed to refer to two aspects of the paper which particularly interest me as a student of the languages of the ancient Near East. In writing of the origins of language Professor Guthrie, as I understand him, states that the study of living languages does not enlighten us concerning the origin of or the original unity of language. Moreover it is not possible to penetrate through the extraordinary diversity of modern or ancient languages to any parent languages or language groups. I do not think that language can be studied in isolation but that the historical traditions concerning its origins need to be consulted. It is noteworthy that Sumerian, the oldest known literary language of Babylonia, is a complex and far from primitive language, and has a clear tradition that language was a gift of the gods to the newly created first man. The idea of language as a divine gift to man is clearly brought out in the Genesis record—called by Professor Richard Wilson in his *Miraculous Birth of Language* " the external divine-origin theory of language". This view continued to be held through the classical Babylonian, Assyrian and Greek periods. It may be that our present historical knowledge of the earliest languages is too scanty to enable us to check whether all languages may stem from one, three or more parent groups listed in Genesis 10 (note especially " tongues " in verses 5, 20, 31). To commence any investigation of linguistic unity or diversity late in the stream of " confused " languages, when they have been multiplied by innumerable intermarriages and borrowings, is to make the task of recovering any parent tongue more difficult.

Again, we are indebted to Professor Guthrie for reminding us that " grammatical correctness " cannot be assayed, especially in a language of such limited source material as Hebrew. If widely accepted, this should indeed do away with fruitless emendations of the text based on false criteria. Nevertheless, while not considering Biblical Hebrew as the *lingua sacra* or *lingua divina*, as did our forbears, I cannot but be tempted to wonder whether the genius of Hebrew, quite apart from any genius resulting from its use as the medium for

divine revelation, may not lie in certain qualities, such as its flexibility, in that it can express abstract ideas with the use of " concrete " terms, and provides us with sufficient data to understand the circumstances, meaning and range of the more important words. Perhaps there is here some permanent element of language, such as was implied by the early use of language in the naming of animals, which makes it an unusual medium. Despite the mainly negative conclusions of recent language studies might we not have in Holy Scripture, with its unique authorship, a permanence of language which is lacking elsewhere today when men use even the same word in the same language (e.g. " freedom," " democracy ") to convey ideas which are diametrically opposed?

I heartily accept the main conclusions of Professor Guthrie's paper and hope that the reminder he gives both of the highest use of language in worship, and of the need for as extensive as possible a knowledge of the intent, circumstances, intonation and range of each word and utterance, may stimulate that deep study of God's Word which it demands.

Mr. TITTERINGTON said: Professor Guthrie has given us a feast of fat things, and one could have wished there had been space for a fuller expansion. Each section of the paper, if not indeed each subsection, could well have formed the subject of a paper by itself.

On p. 54 Professor Guthrie says, " only where there are large areas of thought commonly involved in the thinking of the speakers of a given language are adequate means of expressing them developed ". It is a commonplace, which Professor Guthrie has mentioned elsewhere in his paper, that a language may be rich in its vocabulary over a wide field of ideas, and yet possess very inadequate means of expressing ideas of another sort. Translators of the Bible have often called attention to the difficulty experienced when the language with which they are concerned simply does not possess the words and expressions needed to convey even some of the most fundamental of spiritual concepts.

On p. 52 the author has pointed out that a language which has suffered a degree of entropy may nevertheless undergo a process of enrichment. This is perhaps especially seen in a vitalized and progressive community, where language is dynamic, and not static. There are perhaps three ways by which this enrichment may be brought about. First, by the method of borrowing from other languages, a process with which we are familiar in English. Then, a language can be enriched by recourse to its own ancient roots—a process which can be exemplified by a language such as Norwegian, or by the development of new verbal forms and combinations from existing roots, as Dr. W. M. Christie showed in a paper he contributed to the INSTITUTE on the Renaissance of Hebrew (*Trans. V. I.* **63**, 1931). But there is still a third method, and that is by giving a new and fuller content to the meanings of existing words, a process to which the Bible has contributed in no small degree. Who can doubt that the very Greek language itself was enriched by the new and Christian content given to a word such as ἀγάπη in the New Testament?

Even in our own tongue, has not a word like " grace " received a fuller meaning through its use in the Bible? Where the language itself has not been adequate to express the ideas, it is the Bible itself that has provided the means, and thus enriched the whole language in the process. It would be interesting to know how far this process is taking place in the languages into which the Scriptures are now being translated. It may even be permissible to ask how far the richness of the Hebrew language in its ability to express spiritual ideas is due to the innate genius of the language, and how far to its use for the expression and preservation of spiritual concepts.

The author's remarks on the distinction between written and spoken language (pp. 56 f.) are important. What must the parable of the prodigal Son have sounded like to those who listened to it for the first time from the Master's own lips?

I should like to comment also on what Professor Guthrie has to say on pp. 57 f. on ambiguity. One writer who has embarked on the experiment of Biblical translation (Mr. T. E. Ford) has pointed out the importance of preserving this ambiguity where it occurs, and has called attention to the dilemma in which translators like Moffatt and Weymouth have found themselves. Where two possible interpretations or translations have been possible, they have had to make a choice between them, and to this extent have become interpreters or commentators rather than translators. Hence the importance of standard translations, such as the Authorized and Revised Versions in English. But even here a dilemma exists, though of a different kind, and this has been resolved in different ways. The translators of 1611, recognizing that there is no one equivalent in one language for a word or form of words in another, have allowed themselves a wide latitude in the choice of words to convey the meaning of a particular word in Greek or Hebrew, and have often done so in a single continuous passage in such a way as to obscure the continuous thread of thought. The revisers have run to the opposite extreme, and by the attempt to express one Hebrew or Greek word by one English equivalent have sometimes produced a rather wooden version. The preface to the Authorized Version, " The Translators to the Reader " (perhaps not so well known as it ought to be) has some pertinent remarks on this subject.

On p. 59 the author says that whilst thought and the communication of thought can exist without language, the use of language greatly increases the possibility of communication. May one ask how far the use of language may assist *memory*? Should we be able to retain a passing thought (especially abstract thought) unless we had translated it into the terms of language? The process of turning a thought into language is usually so rapid that we are unable to distinguish between the thought itself and its expression.

One final question. What is the relationship between the pattern of the language of any given people, and the pattern of their thinking? Does the language colour the thinking, or the thinking the language; and in what way and to what extent?

Mr. B. C. MARTIN said: In Professor Guthrie's valuable paper he states "that there is nothing in the known facts about the probable origins of language to show that man was not created with the faculty of speech" (p. 54). Cannot we go further and say that God endowed him with a language to speak?

According to the early chapters of Genesis God spoke to Adam, who understood Him and replied. Moreover Adam invented new words, for "whatsoever Adam called every living creature, that was the name thereof" (Gen. 2: 19).

Another small point: Professor Guthrie mentioned in his address that in some languages there were few parts of speech or none, and in particular that no distinction was made between verbs and nouns. One presumes, however, that in such languages the ideas of subject and "predicate", necessary to all logical propositions, are in some way distinguished. Otherwise it is difficult to see how such languages could be intelligible!

WRITTEN COMMUNICATIONS

MR. F. F. BRUCE wrote: As a present teacher of Biblical studies and a former *Sprachwissenschaftler*, I have read every part of Professor Guthrie's paper with great interest and pleasure, and venture to underline some of the things which he has said about the area where linguistic and Biblical studies overlap.

(1) His remark that "it is a small part only of the total content of an utterance that can be recorded in the normal methods of writing languages" (p. 56) is something that should be borne in mind by those who talk too naively about "verbal inspiration". It is also of considerable importance in Biblical interpretation, especially (as he goes on to point out) where the interpretation of sayings of Jesus is in question. Commentators will argue endlessly, no doubt, about the precise implication of our Lord's word to the Syrophoenician woman: "it is not meet to take the children's bread, and to cast it unto the dogs" (Mark 7 : 27). It *may* be that we should emphasize the diminutive *kynaria*, the more so as He perhaps spoke to her in Greek—but even so the diminutive could refer to pariah pups as much as to pet dogs. How clear the whole sense of what He said would become if only we could overhear the tone of His voice or see the look on His face! Or again, how are we to understand His words to the hypocritical scribes and Pharisees: "Woe unto you! . . . Ye serpents, ye offspring of vipers, how shall ye escape the judgment of Gehenna?" (Matt. 23 : 29–33). Are they words of denunciation, or of grief because of the doom to which their blindness was swiftly carrying them? Knowing our Lord as we do, we may have little hesitation between the two alternatives; but if His words had been reproduced phonographically instead of by written symbols, the question would not arise.

(2) The suggestion that certain words in the Bible "which had one meaning in the situation where they were first spoken, may have another meaning

within the different situation obtaining for those who read the words now " (p. 57), is one that has verified itself in the experience of many readers. It is always true, as John Robinson said to the Pilgrim Fathers in 1620, that " the Lord has more truth yet to break forth out of His holy Word ". But any fresh meaning must be closely related to the meaning that the words had in their primary context; it must be a deeper appreciation of the sense that is there already. The words that Isaiah spoke in the context of the Assyrian menace of the eighth century B.C. have a meaning for readers in the twentieth century A.D., but it is only by ascertaining the meaning of the words in that original context that we shall discover in them a meaning legitimately applicable to our situation to-day. The principles according to which the New Testament writers re-applied Old Testament prophecies are illuminating here; they have been very helpfully studied and expounded of late by C. H. Dodd in *According to the Scriptures* (1952).

(3) Most important and necessary of all the points that Professor Guthrie makes is his insistence that " the whole concept of literal translation is a figment " (p. 58). This is true of all translation, of course, but it needs to be specially emphasized in relation to the Bible, since (for reasons which are not far to seek but need not be elaborated here) the idea that the most literal translation is the best translation is one that has particularly bedevilled Biblical study. The superstition that it is possible to draw up a list of exact parallels between the vocabularies of two languages, and then produce an accurate version by simply replacing a term from the one list by the parallel term from the other list, is one that dies hard, as the discussion pages of our *Transactions* show. For example, to translate the words of our Lord in John 2: 4 (*ti emoi kai soi*?) literally as " What to me and to thee ? " is not to get closer to His meaning but to lose it altogether. And when an attempt is made to translate the whole Bible on such principles, the result can be called a translation only in the sense in which the metamorphosed weaver's frightened comrades cried out to him in *A Midsummer Night's Dream:* " Bless thee, Bottom ! bless thee ! thou art *translated* ". The proper procedure, as Hilaire Belloc once put it, is not to ask ourselves " How shall I make this foreigner talk English? " but " What would an Englishman have said to express the same? " (See Ronald A. Knox, *On Englishing the Bible*, p. 19 ; this whole book is an important contribution to the subject under discussion.) Professor Guthrie has deserved well of the VICTORIA INSTITUTE by reminding us of the truth once so concisely expressed by Thomas Hobbes: " Words are the counters of wise men, they do but reckon with them; but they are the money of fools ".

The REV. J. B. PHILLIPS wrote: I find myself very much in agreement with Professor Guthrie. To me it is every bit as important to understand the words, thought-forms and usages of the people for whom you are translating as it is to understand the original text. As a member of the Translations Committee of the British and Foreign Bible Society, we are constantly finding

that what used to pass for good literal translation does not necessarily convey either the emotional or even the intellectual content of the original writer.

Mr. B. B. KNOPP wrote: I read with great pleasure Professor Guthrie's Paper and should like to thank him for it and to congratulate both him and the INSTITUTE. I should have preferred a longer paper but apart from this I have no criticism to offer. Indeed it would be impertinent for anyone to do so without the necessary specialized knowledge. Perhaps however I may be allowed to make one or two interrogatory observations which will be useful if they have the effect of drawing from Professor Guthrie authoritative statements for the enlightenment of members.

In demolishing on pp. 52–54 the widely held theories of the origin of speech our Vice-President, quite incidentally to his main theme but nevertheless truly, has furnished us with another cogent argument against the evolutionary philosophic ideas of to-day. If language did not start with the simple and develop to the complex then certainly animals did not gradually acquire the power of speech, for on *that* hypothesis there could not have been any other order. Probably Dr. Guthrie would agree that the theories of language to which he refers were not independent of evolution but were imposed by it.

I wonder if Professor Guthrie would say as a result of his special study that simplicity in language could be traced to standardization as a consequence of writing. Presumably language was spoken before it was written, and the effect of writing would perhaps tend to simplicity—this in turn reacting on the spoken language. Have we an example of this in its later form in the disappearance of gender and case endings from English? I suggest standardized spelling may also be due to writing—not to speak of modern efforts towards simplified spelling, which certainly are.

Reference is made in the paper to the vast vocabulary of most African languages. In this connection I remember reading in Archbishop Trench's well-known book *On The Study of Words* of the disappearance from the language of the Bechuanas of the word *Morimo*, signifying " Him that is above ". The Archbishop quotes this instance as pointing to the tribe's being, not a primitive people at the beginning of their development, but the remnant and ruin of a better and nobler past. Could Professor Guthrie say whether this example is typical of a general tendency?

The reference of this Paper to the written language of the Bible is very interesting and gives rise to profound thought. It is not possible to analyse or to understand the processes of divine inspiration, but I suggest that only by these processes could the problem of real precision be overcome. The ultimate Author of the Bible is the same Person who enlightens the readers, and only those who are so enlightened truly understand what is written. The things of the Spirit of God are spiritually discerned (1 Cor. 2 : 14). The remark on "dual import " on p. 57 is also profoundly true. Apart also from dual, or even multiple, general interpretation, the Holy Spirit can, and often does, take a passage from the Old Testament spoken in the long past to the Jewish nation

(say for instance Isa. 1 : 18) and apply it to the heart of a believer of our own day, setting him at liberty from his former bondage to Satan. The Word of God is the seed sown by the Sower (Mark 4 : 14).

On the subject of real precision of meaning I suggest that there is reason for saying that we are much nearer the true meaning of the language of the Bible than of any other writings. In this field the best minds of two thousand years, and in some cases more, have worked and re-worked over every square inch of the same ground again and again. Every possible hypothesis has been tried and tested and argued about by scholars of the first rank, and every word examined and carefully scrutinized times without number. No other writings have been examined with such patience and perseverance, and I suggest that as a consequence our intellectual knowledge of the real meaning of the words of Scripture cannot fail to be far more precise and more profound than our knowledge of any other literary compositions. This is not of course to deny what I believe to be true, that the Holy Spirit has yet more light to break forth from His Word in time to come.

Author's Reply

The Chairman has referred to the need to consult historical traditions before attempting to determine the probable origins of language. This is no doubt a wise plan wherever the nature of such traditions can be known with some degree of certainty. Nevertheless the point I was trying to make was rather that on the basis of purely linguistic evidence no satisfactory conclusions can be reached about the presumed original languages.

The query put by Mr. Titterington about the relationship of memory to language is indeed interesting, and belongs as much to psychology as to our present subject. I would certainly agree that the faculty of language does indeed increase our facility for remembering, but wonder whether this is not mainly confined to those realms where language is also the vehicle for thought itself.

Many important questions are involved in the interdependence of the pattern of a people's language and that of their thinking. It would be possible to adduce evidence to show that in some cases the controlling factor appears to be in the language and in others in the thought patterns. For my part I doubt whether it is possible to generalize beyond the simple suggestion that there may be a parallel development on the two levels in most languages.

While I fully agree with Mr. Martin that the Bible gives us the authority for asserting that God made man with the power of speech, in my paper I was in fact pointing out that there is nothing in the linguistic evidence to conflict with this.

On the more detailed point about the necessity that every language must have " subject " and " predicate " there is no time available to go into this highly specialized subject. It may however be worth noting that what is termed " predicate " in conventional grammar is not the same thing as the

" predicate " in logic. Indeed the linguistic expressions used in logic often bear no resemblance to what is actually said in any known language.

In his communication Mr. Knopp asks whether some of the commonly held theories of the origin of language were probably due to an evolutionary philosophy. It would seem quite feasible that they should be, since for the most part those who developed these theories presumably subscribed to the widely accepted hypothesis of the evolutionary origin of man.

The whole problem of the interaction of spoken and written language is very complicated, and I doubt whether it would be possible to attribute simplicity in a given language to the fact that it had been reduced to writing. Indeed among the languages of Africa which are still exclusively spoken, there are innumerable degrees of simplicity—and of complication.

In reference to the quotation from Archbishop Trench about the language of the Bechuana, I should personally be most loath to draw any conclusions of that kind from a single word, or even a group of words. The factors involved in the desuetude of a word are so varied that it is almost impossible to be sure that in any given case the most important factor has not escaped detection.

In summing up may I refer to the wishes expressed that my paper might have been longer. In fact there were only two possible courses open to me. Either the subject had to be dealt with somewhat cursorily, or it would have involved something of quite unmanageable dimensions. This left me no option then but to treat some of the more important aspects of the topic in outline, in the hope that others with more knowledge and time than I have might at some time give themselves to the task of developing further some of the themes that I have touched on.

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THE GEOGRAPHICAL BACKGROUND IN OLD TESTAMENT EXEGESIS

J. M. HOUSTON, M.A., B.SC., D.PHIL.

The Rev. S. Runsie Craig Memorial, 1954

In accordance with the terms of the Trust the Council have selected for the 1954 Memorial the Paper on " The Geographical Background in Old Testament Exegesis " read before the Institute on 12th April, 1954, by J. M. Houston, M.A., B.Sc., D.Phil., as being strongly confirmatory of the Christian Faith.

DISCUSSION

THE CHAIRMAN (J. H. PATERSON, Esq., M.A.) said: May I, on your behalf, now thank Dr. Houston for his most interesting paper? It is indeed remarkable that, in revealing Himself, God should have related His revelation to one particular environment; should have chosen a particular locality in which to develop it, and should, in fact, have expressed the intention of returning, in due course, to the same locality to consummate it. This localization of God's revelation gives importance to two points which Dr. Houston has raised—the reliability of the environmental detail in the Scriptures, and the moral issues that arise from it.

As to the reliability of the detail, Dr. Houston has shown, and we may agree, that the standard is high. To test the matter in reverse, if we follow the Biblical descriptions, we have little difficulty in identifying the area, or at least the type of area, in which the story unfolds. You will recall that not the least interesting aspect of the present development in Israel is the use of Old Testament references in the discovery of the new state's resources. However, within this sphere, one problem undoubtedly presents itself. In what sense could this promised land be described as flowing with milk and honey? To the Jewish immigrant, toiling on its stony surface, the description must seem, to say the least of it, ironical. Dr. Houston has pointed out the weaknesses of theories of climatic change since Biblical times. He has also drawn attention—and upon this he might, perhaps, have dwelt at greater length—to the factors of human use which can produce, in this environment, results comparable to those of a general desiccation.

This leads at once to the second point—the moral issues arising from this background. It seems highly significant that, for His revelation, God chose precisely this environment. On the one hand, He chose an area where man's dependence on natural factors lying beyond his control is particularly marked. W. B. Fisher (*The Middle East*, London 1950) refers to " a delicate balance between dampness and aridity ", and to a rainfall which is " very capricious ". The early and latter rains have lost none of their Old Testament significance, and a sequence of years with sub-normal rainfall may force the margins of

cultivation back and ruin the farmer. On the other hand, this is an area where such " balance " as exists can easily be upset by man's activities. In other words, Palestine is very largely what you make of it. Treated with care, and used in conjunction with adjoining areas included in the original promise (Gen. 15: 18–21), it can yield a satisfactory livelihood, with contrasting conditions affording a variety of resources. But let the Israelites farm it carelessly, in violation of the rules laid down for the land; let them by their own weakness fail to occupy the whole of the necessary resource base (Judges 1–3); or let them by their folly provoke foreign invasion or internecine war, and the " delicate balance " was lost again. This promised home of Israel, intermediate between the complete barrenness of the desert and the attractive, if artificial fertility of the irrigated valleys of Nile or Euphrates, was chosen for them by God for purposes that become more clear in the New Testament, and so lie outside our subject for to-day. Suffice it for the present to say that if, as Dr. Houston has this evening so ably pointed out, the geographical circumstances illuminate God's revelation, then the more fully we appreciate the environment, the more readily we shall enter into spiritual understanding. As the Revised Version translates Hosea 6: 3, " Let us know, let us follow on to know the LORD; . . . He shall come unto us as the rain, as the latter rain that watereth the earth".

Mr. D. J. WISEMAN said: In thanking Dr. Houston for his helpful paper it would be interesting to ask if he were able to expand his remarks on the ecological instability of Palestine, especially with reference to afforestation. There are at present at least two widely held views concerning " the land flowing with milk and honey ". Some take the phrase metaphorically as the promised land presented to a nomad people as a place of wealth and sufficiency. Though barren and rugged, its geographical position enabled the inhabitants to control the adjacent caravan routes and gain a living from taxes and spoil. Others would see in the physical division of the land a literal abundance of milk from the herds in the low-lying Shephelah plains and of honey from the afforested hill regions. Professor Glueck's recent archaeological surveys of the Negeb show many traces of occupation in this once well-irrigated region, but more details of the period of occupation of these sites would be needed to form any opinion on the density of population in any one period. Would the emphasis on " honey " imply a heavily afforested zone? The term for honey (*debhash*,=Akkad. *dishpu*) is used equally of date-honey or any honey, whether from fruits or bees. There is some Biblical evidence that honey was often collected from the rock-crevices or from the ground and that the term also covered grape-syrup. In this case the term would afford little evidence for the actual fertility of the area. It would, moreover, be important if Dr. Houston could examine any historical evidence for deforestation. Was this due to the introduction of goats or to the Roman invaders, as we are so often told?

Author's Reply

I am grateful to our chairman for his kind words. Reference was made to the " latter rain ". The phrase " the former and the latter rain " has frequently been misconstrued as referring to two seasonal maxima of precipitation in the course of the year. Such a régime does not exist in Palestine, which is characterized by a marked winter maximum in December and January. The phrase merely suggests the importance of the onset and the termination of the rainy season in the agricultural calendar.

Reference has also been made to the description of Palestine, as " a land flowing with milk and honey ". Too often this phrase has been idealized in a European context. It does not mean necessarily a pastoral landscape of green fields and wooded hills. The herbage of the semi-steppe, and the mellifluent flora associated with the oleaginous shrubs, have always sustained extensive forms of pastoralism and primitive practices of apiculture. The reference to honey does not imply therefore that there were forests. It is clear from the Old Testament narrative that Solomon was dependent for his building programme on the timber resources of Lebanon (I Kings 5: 8–10). The rainfall map (fig. 2) explains the reason, for Lebanon has a mean annual precipitation of over 40 inches, compared with the 20–25 inches on the Judaean hills. Koeppel has shown roughly the former limits of woodland cover as " forest " (fig. 4) but there is no evidence that this was more than light Mediterranean woodland.

In answer to Mr. Wiseman's query about deforestation, it is impossible to attribute this to any one cause. The first definite evidence in the Old Testament of systematic clearance of woodland is given in Joshua's challenge to the Israelites, " If thou be a great people, then get thee up to the wood country and cut down for thyself there"(Josh. 17: 15, 18). The central ridge of Palestine was colonized in this way from the thirteenth century B.C., aided by the use of cisterns for water storage in the limestone terrain. It was here that the Gibeonites were made " hewers of wood and drawers of water " (Josh. 9: 27) and legislation was passed to deal with accidents among those felling trees (Deut. 19: 5). Several passages make reference to fire as a cause of forest destruction (Ps. 83: 14; Isa. 10: 18; Jer. 21: 14). Once destroyed, the woodland would be prevented from regeneration by the grazing habits of the goat and by soil erosion. Doubtless the Romans cleared considerable tracts of forest, particularly in northern Palestine where their settlement was closest. Thus the systematic periods of colonization and the careless grazing of other times would both contribute to the lack of woodland cover until the present century.

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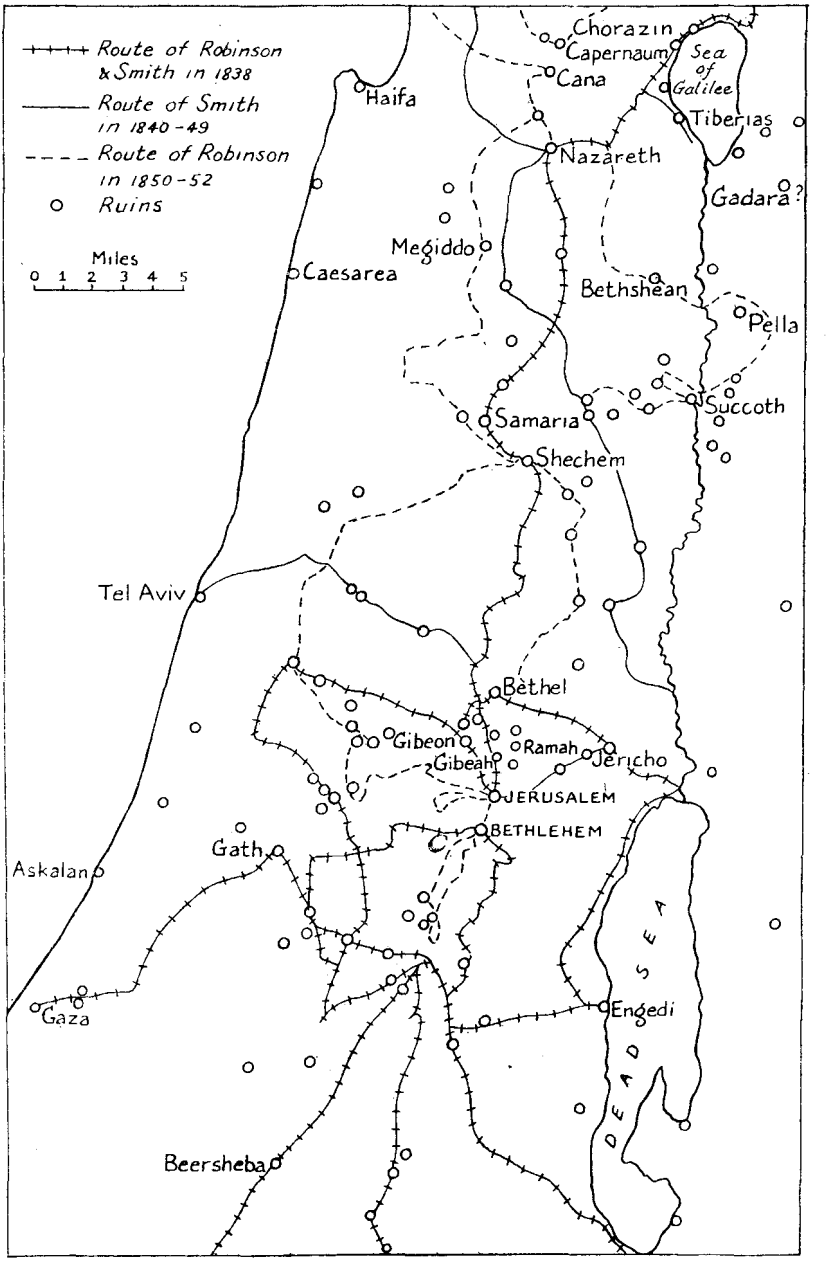
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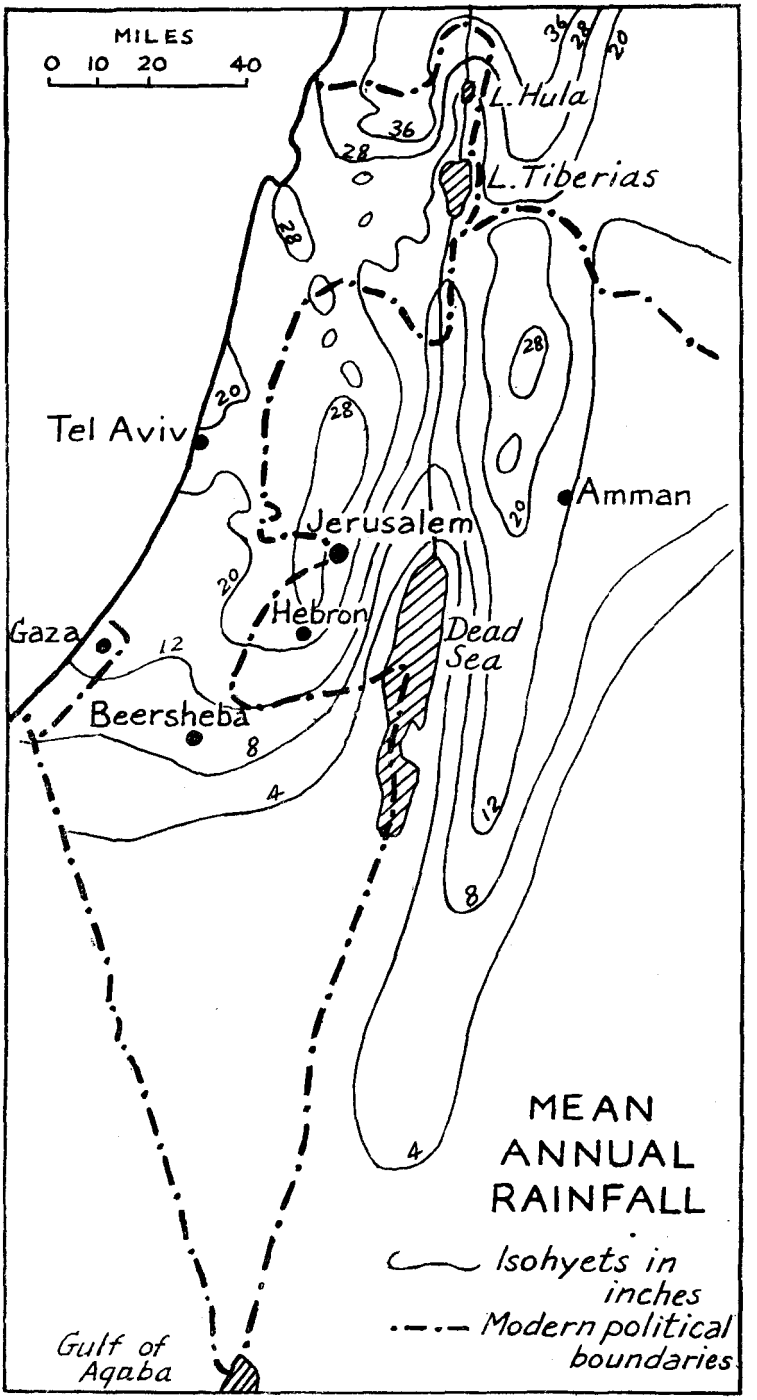
Fig. 1.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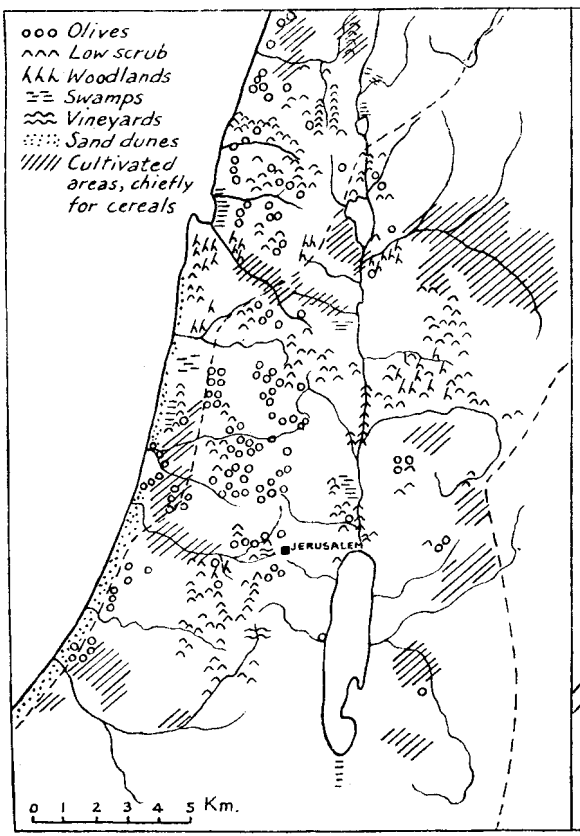

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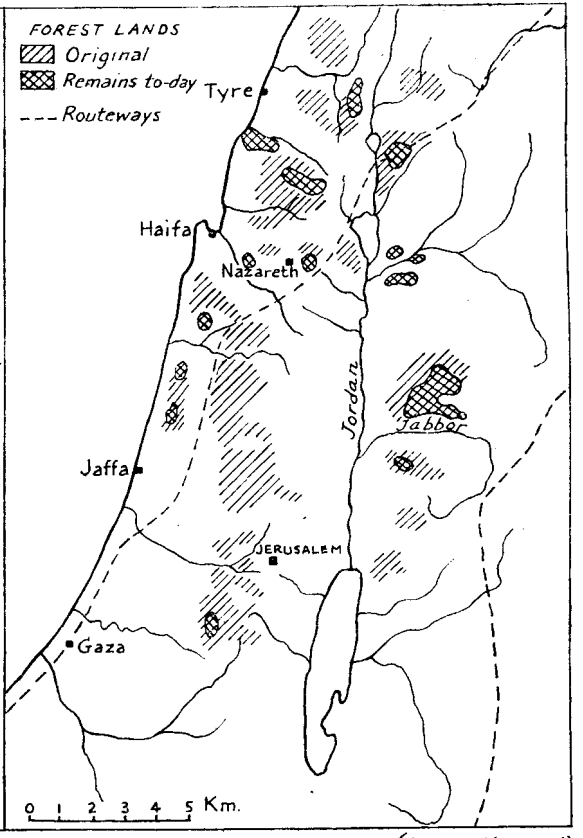

(After Koeppel)

Fig. 4.

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