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JOURNAL OF THE TRANSACTIONS
OF
THE VICTORIA INSTITUTE

VOL. LXIII.

JOURNAL OF
THE TRANSACTIONS

OF

The Victoria Institute,

OR,

Philosophical Society of Great Britain.

VOL. LXIII.



LONDON:

Published by the Institute, 1, Central Buildings, Westminster, S.W.1.

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1931

LONDON :

HARRISON AND SONS, LTD., PRINTERS IN ORDINARY TO HIS MAJESTY,
ST. MARTIN'S LANE.

PREFACE.

THE present volume, the sixty-third in series, is given to the world at a time when such organizations as the Victoria Institute are encountering peculiar difficulty by reason of financial stringency and the call for public economy.

In a day when unbelieving materialism abounds, and the fundamental facts and principles of the Christian faith are widely ignored, it is of deep importance that the work of the Institute should be steadily maintained; and, with the help of God, the Council contemplate plans which, it is hoped, will yield stabilizing results.

The contents of the volume speak for themselves. The greatly valued work of the President occupies the opening and concluding sections—the former with a paper on “Adaptation in Nature as Evidence of Purposive Thought,” and the latter with an Essay on “Light.” With excellent reason, and to the manifest advantage of the Institute, these papers were accorded a warm greeting in the daily press at the time of their delivery.

The Schofield Memorial Paper, by Dr. James Knight, entitled “Demon-Possession, Scriptural and Modern,” was a contribution of outstanding significance, being on all hands welcomed as an important study of a subject of pressing interest at the present time.

Subjects of a well-defined topical value included “The Renaissance of Hebrew,” by Rev. Dr. W. M. Christie, of Haifa, Palestine; and “The Influence of Christianity on Indian Politics,” by Mr. W. N. Delevingne. Both of these papers were by Lecturers of large experience and keen observation in Oriental Lands.

Scientific investigation was represented by "The History of Practical Astronomy," by Col. F. C. Molesworth, F.R.A.S. ; and by "Climatic Changes since the Ice Age," by Dr. C. E. T. Brooks ; while Biblical Chronology was explored in a paper by Lt.-Col. A. G. Shortt, on "The Fifteenth Year of Tiberius" ; and Bible Biography as surveyed by Rev. A. H. Finn, in a Lecture on "Types in Scripture."

Dr. D. M. McIntyre's paper, "The Jewish Apocalyptic and its Bearing on the New Testament," traversed ground that was largely unfamiliar, and on that account, among others, it will prove specially attractive to many readers.

In some cases the attendances upon the Lectures were exceptionally large, thus furnishing evidence of the confidence of the public in the important work which the Institute has in hand. In going forward for another year, the Council reckon on the support which its great cause demands, and demands in ever-expanding degree. In particular, there is call for sustained effort on the part of the supporters of the Institute in regard to the introduction of new Members and Associates, to the end that the work may go forward "to the Greater Glory of God."

JAMES W. THIRTLE,
Chairman of Council.

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VICTORIA INSTITUTE.

REPORT OF THE COUNCIL FOR THE YEAR 1930.

TO BE READ AT THE

ANNUAL GENERAL MEETING, JUNE 15TH, 1931.

1. *Progress of the Institute.*

The Council beg herewith to present to Members and Associates the Report of the Annual Proceedings of the Society, in which is included the usual Balance Sheet, duly audited. Of the papers read before the Society, the President has once more contributed the first—the fruit of a recent visit to the Holy Land—on a possible site of the Resurrection, and the last, on “Creation and Modern Cosmogony.” Both papers aroused general interest, as also did that by Dr. Christie on the present-day relation of Arabs and Jews in Palestine.

We were also favoured by a visit from Professor J. Garstang, fresh from his excavations in Bible lands, with the financial backing of Sir Charles Marston—a Member of the Council. The professor told us he began with an open mind, feeling that the Bible narrative in general could not be dismissed as devoid of historical foundation. But repeated visits to various sites “impressed him deeply with a sense of material reality underlying the historical narrative in Joshua and Judges.” Later, selecting Jericho, Ai and Hazor as test sites, “these were examined more deeply with the spade, and the impression became positive. No radical flaw was found in all the topography and archæology of those documents.” They were all found to have been destroyed about 1400 B.C.—i.e. the time of Joshua’s entrance into the land. The two latter sites were abandoned; Jericho was only rebuilt some centuries later, as we also know was the case from the Bible history.

2. *Meetings.*

Twelve ordinary Meetings were held during the Session 1929-30. The papers published were :—

“The Garden Tomb at Jerusalem: A Possible Site of the Resurrection,” by Sir AMBROSE FLEMING, D.Sc., F.R.S.

Dr. James W. Thirtle, M.R.A.S., in the Chair.

“Christ and the Scriptures. The Old Testament: The Implications,” by the Rev. F. W. PITT. (Being the Second Prize Essay for the Gunning Prize Competition, 1927.)

Benjamin I. Greenwood, Esq., in the Chair.

“Scientific Discoveries and their Bearing on the Biblical Account of the Noachian Deluge,” by Lieut.-Col. L. M. DAVIES, R.A., F.G.S. (Being the Langhorne Orchard Prize Essay, 1929.)

Alfred W. Oke, Esq., LL.M., F.G.S., in the Chair.

“Arabs and Jews in Palestine,” by the Rev. W. M. CHRISTIE, D.D.

The Rev. A. H. Finn in the Chair.

“The Date of Ecclesiasticus,” by Brig.-General H. BIDDULPH, C.B., C.M.G., D.S.O.

Dr. James W. Thirtle, M.R.A.S., in the Chair.

“The Significance of the Old Testament Scriptures to Our Lord Jesus Christ,” by Lieut.-Col. T. C. SKINNER, F.R.Met.Soc.

Dr. James W. Thirtle, M.R.A.S., in the Chair.

“How Far do the Apologetics of Bacon, Butler and Paley hold good for Present Use,” by the Rev. CHARLES GARDNER, M.A.

Lieut.-Col. F. A. Molony, O.B.E., in the Chair.

“The Last Days of Our Lord’s Ministry,” by Lieut.-Col. A. H. C. KENNEY-HERBERT.

William C. Edwards, Esq., in the Chair.

“The Concept of Evolution in the New Psychology,” by the Rev. HAROLD C. MORTON, B.A., Ph.D.

The Rev. Charles Gardner, M.A., in the Chair.

“Joshua and the Higher Critics,” by Prof. J. GARSTANG, D.Sc., F.S.A.

Dr. James W. Thirtle, M.R.A.S., in the Chair.

“The Jews under the Palestine Mandate,” by ISRAEL COHEN, Esq.

Alfred W. Oke, Esq., LL.M., F.G.S., in the Chair.

Annual Address: “Creation and Modern Cosmogony,” by Sir AMBROSE FLEMING, D.Sc., F.R.S. (President).

Dr. James W. Thirtle, M.R.A.S., in the Chair.

3. Council and Officers.

The following is a list of the Council and Officers for the year 1930 :—

President.

Sir Ambrose Fleming, M.A., D.Sc., F.R.S.

Vice-Presidents.

Professor T. G. Pinches, LL.D., M.R.A.S.
 Right Rev. Bishop J. E. C. Weldon, M.A., D.D.
 J. W. Thirtle, Esq., M.A., LL.D., M.R.A.S., F.R.G.S., *Chairman of Council.*

Trustees.

Alfred William Oke, Esq., B.A., LL.M., F.G.S.
 Martin H. F. Sutton, Esq., J.P., F.L.S., F.R.G.S.

Council.

(In Order of Original Election.)

Alfred William Oke, Esq., B.A., LL.M., F.G.S.	Arthur Rendle Short, Esq., M.D., B.S., B.Sc., F.R.C.S.
Sir Robert W. Dibdin, F.R.G.S.	The Rev. Harold C. Morton, B.A., Ph.D.
H. Lance-Gray, Esq.	William C. Edwards, Esq.
John Clarke Dick, Esq., M.A.	Robert Duncan, Esq., M.B.E., I.S.O.
W. Hoste, Esq., B.A.	Louis E. Wood, Esq., M.B., D.P.H.
Lieut.-Col. F. A. Molony, O.B.E., late R.E.	The Rev. J. J. B. Coles, M.A.
Lieut.-Col. Hope Biddulph, D.S.O., late R.F.A.	Lieut.-Col. T. C. Skiuner, F.R.Met.Soc.
Avary H. Forbes, Esq., M.A.	Sir Charles Marston, J.P.

Honorary Treasurer.

William C. Edwards, Esq.

Honorary Editor of the Journal.

Dr. James W. Thirtle, M.R.A.S.

Honorary Secretary, Papers Committee.

Lieut.-Col. Hope Biddulph, D.S.O., late R.F.A.

Honorary Secretary.

William Hoste, Esq., B.A.

Assistant Honorary Secretary.

Lieut.-Col. T. C. Skinner.

Auditor.

E. Luff-Smith, Esq. (Incorporated Accountant).

Secretary.

Mr A. E. Montague.

4. Election of Officers.

In accordance with the Rules, the following Members of Council retire by rotation : Alfred W. Oke, Esq., LL.M., F.G.S., Sir Robert W. Dibdin, F.R.G.S., and the Rev. J. J. B. Coles, M.A. The first two offer themselves for re-election and are re-nominated by the Council, who also nominate Lieut.-Col. Arthur Kenney-Herbert,

W. N. Delevingne, Esq., Cyril C. O. Van Lennep, Esq., and the Rev. Principal H. S. Curr, M.A., B.D., B.Litt.(Oxon.).

5. *Obituary.*

The Council regret to announce the deaths of the following Members and Associates:—

Mrs. F. C. Kemble, Mrs. E. M. Martley, Professor E. R. Matthews, M.Inst.C.E., Herbert Michell, Esq., Dr. T. E. Nuttall, the Rev. Alfred Oates, the Rev. John Ridley, Henry P. Rudd, Esq., D. Somerville, Esq., Alexander Stewart, Esq., Martin H. F. Sutton, Esq., J.P., F.L.S., the Rev. John Tuckwell, G. H. Wedekind, Esq., the Rt. Rev. E. G. Weed, Bishop of Florida, U.S.A., Peter F. Wood, Esq.

6. *New Members and Associates.*

The following are the names of new Members and Associates elected up to the end of 1930:—

LIFE MEMBER.—Miss Kathleen R. Oke.

MEMBERS.—W. Poynter Adams, Esq., M.I.M.E., Lieut.-Col. Hope Biddulph, D.S.O., Alfred P. E. Clark, Esq., M.B.E., Dr. Eliot Curwen, B.Ch., the Rev. P. B. Hill, D.D., Lieut.-Col. Arthur Kenney-Herbert, John W. Laing, Esq., the Rev. F. E. Marsh, D.D., Charles W. Pike, Esq., Mrs. N. F. Ruthven Smith, Dr. J. E. Shelley, B.S., Lieut.-Col. A. G. Shortt, B.A., Lieut.-Col. T. C. Skinner, Arthur D. Thorpe, Esq., J.P.

LIFE ASSOCIATES.—Dr. Mary R. Fleming, Mrs. Ina E. Trinder-Smith, B.A., M.Sc.

ASSOCIATES.—Mrs. Ethel Bilton, Dr. Thomas W. Buchan, Edgar P. Chance, Esq., M.A., the Rev. W. Crowe, D.D., Gordon N. Davidson, Esq., Norman S. Denham, Esq., D.Litt., the Rev. Walter Ellis, M.A., B.D., Colonel John J. Galloway, Dr. James Hunter Gillespie, B.Ch., Joseph C. Fromow, Esq., Leslie M. Hopkins, Esq., G. A. Hooke, Esq., Mrs. H. Lander Johnston, F.R.G.S., M.R.I., the Rev. J. E. Kuizenga, D.D., Miss H. J. MacEwan, Miss M. D. MacEwan, the Rev. Frank Madeley, M.A., Arthur W. H. Moule, Esq., M.A., Mrs. E. M. Moore, James Bruce Norris, Esq., William H. Pickering, Esq., Alfred H. Roberts, Esq., O.B.E., Miss E. M. Shubrick, Lieut.-Col. J. B. Stracey-Clitherow, C.B.E., Daniel G. Skeate, Esq., the Rev. G. Houghton Thorne, M.R.A.S., A. J. Vereker, Esq., M.C.

STUDENT ASSOCIATES.—Gordon F. Claringbull, Esq., Douglas Johnson, Esq., B.A., Neil M. G. Kerr, Esq.

7. *Number of Members and Associates.*

The following statement shows the number of supporters of the Institute at the end of 1930:—

Life Members	...	...	...	14
Annual Members	...	...	...	111
Life Associates	...	...	...	50
Associates	...	...	...	264
Missionary Associates	...	...	...	11
Library Associates	...	...	...	31
Student Associates	...	...	...	3

8. *Donations.*

Dr. Henry W. Beedham, £1 1s. 0d. ; The Rev. W. E. Boggs, B.A., £1 ; A. Greenlees, Esq., £1 1s. 0d. ; W. R. Rowlatt Jones, Esq., £3 3s. 0d. ; The Rev. Roland Audley Smith, M.A., £5 ; C. van Lennep, Esq., 12s. 8d. ; Dr. Louis E. Wood, £10.

9. *Finance.*

It cannot yet be said that the problem of how best to meet the financial position of the Institute has been satisfactorily solved ; rather has the deficit been increasing annually, and the Council feel that the Society as a whole must be asked to realize, perhaps a little more than has hitherto been the case, their solidarity with the Council in a matter which touches all equally. Their work is, of course, as is known, strictly honorary, and they are glad that it should be so, but they believe that perhaps if it were realized more, their fellow-Members who are not in office would feel it incumbent upon them to share with the Council their burdens. A special appeal will shortly reach all Members and Associates, to which their earnest attention is called. This appeal is not primarily to ask for financial assistance, though if subscribers could do something practical in this way it would certainly temporarily relieve the situation, but what is needed even more than this is the help of each Member and Associate in increasing the membership of the Institute. It is to this question that the special appeal addresses itself, and to which the earnest attention of all is invited.

10. *Conclusion.*

The Council are determined with Divine help to carry on the work of the Victoria Institute with renewed energy. To afford a platform on which such lectures as that of Professor Garstang, already alluded to, can be welcomed and sympathetically discussed in their important bearing on the truth and accuracy of Bible history is more than an apology for the existence of our Society in face of the spirit of negation so prevalent to-day, it is a justification. When the Modernist theory thought it had finally disposed of such stories as the fallen walls of Jericho and their destruction by fire, the excavator, who has no interest to serve, comes back and tells us he has seen the walls laid low and consumed by fire, as the Scriptural account has been saying was the case during three millenniums.

JAMES W. THIRTLE,
Chairman of Council.

BALANCE SHEET, 31ST DECEMBER, 1930.

LIABILITIES.				ASSETS.														
		£	s.	d.			£	s.	d.									
SUBSCRIPTIONS PAID IN ADVANCE				21	0	0	CASH AT BANK :—										
SUNDRY CREDITORS for :—																		
Printing and Stationery	370	14	2														
Audit Fee	3	3	0														
					373	17	2	Current Account										
								101	2	2								
LIFE SUBSCRIPTIONS :—																		
Balance at 1st January, 1930	152	2	0	Current Account <i>re</i> Schofield Memorial													
Additions	44	14	0														
								321			2	2						
		196	16	0	"Gunning Prize" Account													
Less Amount carried to Income and Expenditure Account										125	18	4						
		10	10	0							16	3	6					
					186	6	0	CASH IN HAND				2	8	3				
"GUNNING PRIZE" FUND (<i>per contra</i>)										INCOME TAX RECOVERABLE				6	18	5		
Balance at 1st January, 1930	107	7	4							SUBSCRIPTIONS IN ARREARS :—							
Add Dividends received <i>less</i> Tax	18	11	0							Estimated to produce				7	7	0	
Income Tax recoverable	5	0	0											INVESTMENTS :—			
					130	18	4	£500 2½ per cent. Consolidated Stock at 52½				262	10	0				
										"Gunning" Fund :—								
										£673 3½ per cent. Conversion Stock at cost				508	0	0		
										"Gunning" Fund :—								
										£258 18s. 3½ per cent. Conversion Stock at cost				200	0	0		

"LANGHORNE ORCHARD PRIZE" FUND				
<i>(per contra)</i>	....	....	....	200 0 0
Balance at 1st January, 1930	....	....	9 0 9	
Add Dividends received <i>less</i> tax	....	....	7 2 9	
Income Tax recoverable	....	....	1 18 5	
			<hr/>	18 1 11
SCHOFIELD MEMORIAL FUND	....	....	220 0 0	
RESERVE ACCOUNT	....	....	262 10 0	
			<hr/>	£1,920 13 5
			<hr/>	

INCOME AND EXPENDITURE ACCOUNT:—

Balance at 1st January, 1930	....	....	367 16 2
Add Excess of Expenditure over			
Income for the year 1930	....	....	124 6 8
			<hr/>
			492 3 5
<i>Deduct:—</i>			
Donations received	....	....	21 17 8
			<hr/>
			470 5 9
			<hr/>
			£1,920 13 5
			<hr/>

I report to the Members of the Victoria Institute that I have audited the foregoing Balance Sheet, dated 31st December, 1930, and have obtained all the information and explanations I have required. I have verified the Cash Balances and Investments. £220 received in connection with the Schofield Memorial has since been invested in Consolidated 2½ per cent. Stock. No valuation of the Library, Furniture or Tracts in hand has been taken. In my opinion the Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the affairs of the Institute according to the best of my information and the explanations given to me, and as shown by the books of the Institute.

21, Old Queen Street, Westminster,
London, S.W.1.

31st March, 1931.

E. LUFF-SMITH,
Incorporated Accountant.

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST DECEMBER, 1930.

EXPENDITURE.					INCOME.				
		£	s.	d.		£	s.	d.	
To Rent, Light, Cleaning and Hire of									
Lecture Room	....	77	3	5					
„ Salary	....	200	0	0					
„ National Insurance	....	3	13	8					
„ Printing and Stationery	....	330	7	5					
„ Expenses of Meetings	....	3	18	6					
„ Library Purchases	....	0	15	6					
„ Postages	....	37	4	5					
„ Audit Fee	....	3	3	0					
„ Fire Insurance	....	0	12	0					
„ Bank Charges and Sundries	....	3	5	11					
		660 3 10							
		£660 3 10							
					By SUBSCRIPTIONS:—				
					100 Members at £2 2s.	210	0	0	
					2 Members at £1 1s.	2	2	0	
					223 Associates at £1 1s.	234	3	0	
					Proportion of Life Subscriptions	10	10	0	
						456 15 0			
					„ DIVIDENDS received, less Tax		9	17	0
					„ SALE OF PUBLICATIONS		69	5	2
						535 17 2			
					„ BALANCE, being excess of Expenditure over Income for the year 1930		124	6	8
						£660 3 10			

THE ANNUAL BUSINESS MEETING

OF THE

VICTORIA INSTITUTE

WAS HELD IN COMMITTEE ROOM B, THE CENTRAL HALL,
WESTMINSTER, S.W.1, ON MONDAY, JUNE 15TH, 1931,
AT 3.30 O'CLOCK.

DR. JAMES W. THIRTLE, M.R.A.S., IN THE CHAIR.

The CHAIRMAN called upon the Hon. Secretary to read the notice convening the Meeting.

The Minutes of the previous Meeting were read, confirmed and signed.

The CHAIRMAN then proposed that the Report, which was printed and in the hands of the members, be taken as read. He made some remarks on the Report and the financial position of the Society, and after some remarks by the Hon. Treasurer, he called on the Auditor to make any remarks he might desire, on the Balance Sheet.

The CHAIRMAN moved and the HON. SECRETARY seconded, the first Resolution.

Resolution No. 1—

“That Alfred W. Oke, Esq., F.G.S., and Sir Robert Dibdin, F.R.G.S., retiring Members of the Council, be re-elected, and that Lieut.-Col. Arthur Kenney-Herbert, W. N. Delevingne, Esq., Cyril Van Lennep, Esq., and the Rev. Principal H. S. Curr, B.D., B.Litt. be elected on the Council, and that Mr. E. Luff-Smith be re-elected Auditor at a fee of three guineas.”

Resolution No. 2 was moved by the Rev. CHARLES W. COOPER, F.G.S., and seconded by JAMES PAYNE, ESQ.

“That the Report and Statement of Accounts for the year 1930, presented by the Council, be received and adopted, and that the thanks of the Meeting be given to the Council, Officers and Auditors for their efficient conduct of the business of the Victoria Institute during the year.”

Resolution No. 3, moved by ALFRED W. OKE, ESQ., F.G.S., seconded by The HON. SECRETARY—

“That the cordial thanks of this Meeting be passed to Dr. JAMES W. THIRTLE, M.R.A.S., for presiding on this occasion.”

739TH ORDINARY GENERAL MEETING,

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL,
WESTMINSTER, S.W.1, ON MONDAY, DECEMBER 1ST, 1930,
AT 4.30 P.M.

DR. JAMES W. THIRTLE, M.R.A.S., IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed, and signed, and the HON. SECRETARY announced the following elections since last meeting:—Members: A. P. S. Clark, Esq., M.B.E.; Lt.-Col. A. H. C. Kenney-Herbert; Lt.-Col. A. G. Shortt, B.A.; Dr. J. E. Shelley, B.S.; Arthur D. Thorpe, Esq., J.P. Life Associate: Mrs. Ina E. Trinder Smith, B.A., M.Sc. Associates: Mrs. Ethel Bilton; Thomas W. Buchan, Esq., M.B., Ch.B.; Edgar P. Chance, Esq., M.A.; Colonel John J. Galloway; G. A. Hooke, Esq.; Miss M. D. MacEwan; A. W. H. Moule, Esq., M.A.; W. H. Pickering, Esq.; Alfred H. Roberts, Esq., O.B.E., M.Inst.C.E.; Lt.-Col. J. B. Stracey-Clitherow, C.B.E. Student Associate: Neil M. G. Kerr, Esq. Missionary Associate: W. C. Irvine, Esq.

The CHAIRMAN then called on the President, Sir Ambrose Fleming, D.Sc., F.R.S., to read his paper on "Adaptation in Nature as evidence of Purposive Thought."

ADAPTATION IN NATURE AS EVIDENCE OF PURPOSIVE THOUGHT.

By SIR AMBROSE FLEMING, F.R.S. (*President*).

1. *The Apparent Dualism in Natural Phenomena.*

WHEN we look around us on the phenomena of Nature, both in the inanimate and in the animate worlds, we see that, broadly speaking, we can divide observed effects into two sets.

There are first those phenomena which under similar conditions appear always to take place in precisely the same manner, and we are able after experience and observation to make statements about the way they happen which we call "laws" of Nature.

In all the vast collection of phenomena included under the sciences of physics, chemistry, astronomy and many other branches of knowledge, we find perfectly regular and definite results which enable us in a multitude of cases to make exact predictions of what will happen under certain conditions.

On the other hand, even in physical phenomena, we find a second set of events which are spasmodic, irregular, uncertain, and apparently capricious. Such, for instance, are the phenomena connected with storms, weather generally, earthquakes, volcanic eruptions and some astronomical phenomena such as comets and temporary stars. Probably all scientific workers would, however, agree that the apparently spasmodic or uncertain nature of this last class of happenings is only due to our ignorance of the processes at work in them, and that if we knew enough about them we should discover the causes of this apparent irregularity and be able to predict the coming of a storm or an earthquake just as accurately as we can now predict the time of a future solar eclipse.

In other words, an article in the creed of science is, or has been, a strict determinism, which means that every event is precisely determined by all previous events and that there is no room for choice, chance or accident. We say above "has been" because, as will be pointed out presently, the latest advances in physics have tended to undermine this strict determinism even in the region of physical events.

Then in the animate world we find a similar duality of a certain kind.

In the vegetable, and in the lower orders of the animal kingdom, we find a constancy of behaviour and life history of individuals which enables us very generally to predict the course of events.

In the higher ranks of the animal species, and especially in human beings, we do not find it possible always to predict what any individuals will do under certain conditions. Their behaviour, in short, is mostly unpredictable.

The special characteristic of nearly all the activity of animal life is that it is *teleological*, that means has an end in view or is purposive.

This purposive activity is, however, very limited in the lower ranks, and we do not know whether it is accompanied by any consciousness of being purposive. At any rate there is little or no exhibition of that which we call *resource*.

Thus, for instance, bees make their honey-comb, wasps their nests and ants their wonderful dwellings, and from these constructions they never vary their procedure. Similarly, for many other species of insects.

On the other hand, in the case of the higher animal races, dogs, elephants, apes, etc., and in a very marked degree in the human race, we find a power of adapting means to an end and what may be called *resource* in dealing with imposed conditions.

Thus, a dog called by his master, but prevented from going directly to him by a fence or hedge, runs along it first one way and then another until he finds some opening through which he can crawl to attain his end. Even an ant dragging a grain of corn back to her nest, if she finds an obstacle in her path such as a stone or stick, tries first one way and then another to get round or over the obstacle.

It is usual to ascribe the special constant teleological activities of lower orders of animals to something called *instinct*, and to use the word *reason* to describe that of the higher orders or particularly of humanity in which resource is markedly present. How far this distinction is justified need not be here discussed.

Then, comparing the inanimate and animate worlds, we for the most part take it for granted that the exceptional phenomena of the latter are purposive or teleological but not necessarily those of the former. When we see, for example, a number of animals behaving in unusual manner, we ask, Why do they do this? We are satisfied if the answer is such as to imply some purpose or end, namely, to defend themselves from some common enemy, or protect their young, or escape some threatening danger.

On the other hand, regarding the exceptional events in the inanimate world, such as an earthquake or storm, we do not say, Why does it do this? or require any answer which shall involve the statement of any motive or purpose. We are quite satisfied with some purely mechanistic explanation of the phenomenon. This shows that taking the phenomena of the Universe as a whole they seem to fall under two broad divisions. First, there are those we call physical, which we consider can best be apprehended and explained as the result of purely

physical or mechanical operations involving only Matter and Energy in various forms and which are spatial and temporal in character that is involve space and time in their operation and are impersonal.

On the other hand, there is the second class of phenomena concerned with animal life which involve the idea of purpose, object or goal by some individual or are essentially teleological in nature. No one has yet been able to show that this teleological activity or purposiveness exhibited in animal life is the result of any atomic mechanism or can be explained mechanistically. Hence we feel compelled to assume as a basis for it some super-material entity we call Mind. If then one part of Nature is teleological, may we not be led to enquire whether the whole of it may not be teleological also? That is, may we not find evidence of adaptation or purpose in the purely physical or non-living side of Nature which will enable it to infer that all of it and not merely one part of Nature exhibits the operation of Mind?

2. The Fundamental Distinction of Matter and Mind.

Before we can discuss the question of the presence of purposiveness in all parts of Nature there is a still more fundamental one to be considered, namely, whether the powers or attributes called mental are the qualities of a veritable and distinct entity called Mind, Soul, or Spirit, or whether they are merely the manifestations of certain kinds of Matter called nerve and brain tissue.

It can hardly be denied that the greater part of the scientific biology of to-day is frankly materialistic and would give denial to the assertion that Mind is independent of Matter. It would probably not agree with such a crude statement as that originally due to the French physician Cabanis and repeated by K. C. Vogt that the brain secretes thought just as the liver secretes bile. But, nevertheless, the idea is predominant that psychic powers are inherent in certain forms of living matter, inseparable from them and cease entirely with the destruction of this form of Matter. The consequences of this, when pressed to its legitimate issue, is that with the destruction of the brain or nervous system all thought and personality must vanish, and that what is called the soul or psyche can no more exist apart from the brain than the flame of a candle can exist apart from

the candle itself. There can be no doubt that this is a question which touches us all in the deepest levels of our minds.

“If a man die shall he live again?” asks Job in his soliloquy (Job xiv, 14) and the answer to this query is surely in the negative unless we can show that there is some element in his personality which is not material and may therefore survive the destruction of the bodily organism. Now if we take the human being in his best-developed type we find a double set of qualities present in him. There are those which are measurable in terms of the same units we employ in connection with physical qualities of non-living matter, viz., mass, space and time, or say in pounds, inches and seconds. Such are his bodily weight, size, surface, density, strength and endurance, etc.

But there are another set of qualities equally real, in every proper sense of the word, which can be more or less or vary in magnitude or degree, but which are not measurable in pounds, inches and seconds or the like. Such are honesty, truthfulness, kindness, generosity, intelligence, memory, resource, persistence, etc., and their opposites. These last qualities are manifested not in relation to other masses of matter but chiefly in relation to other beings possessing similar non-material qualities. Just as the material qualities may be summed up in one word, namely, that they are spatial or related to space, so the non-material qualities may be summed up in one word and said to be purposive or teleological. The former taken together are included under the term Matter and the latter under the term Mind.

There is therefore here also a manifest duality, but that duality is not acceptable to a large class of philosophic enquirers. The materialism of to-day seeks to evade this duality by the assumption that Matter, or at least living Matter, has psychic as well as physical properties. The essential character of all these psychic qualities is that they are purposive—that is, have an end in view.

Moreover, at least in the higher animals, there is also a self-consciousness. We not only receive stimuli through the senses, which give rise to thoughts and prompt to purposive action, but we are conscious that we *do* personally receive them.

Materialism pure and simple has never given the slightest valid explanation of the way in which this consciousness and purposiveness arises in atomic matter. Whatever may be the structure of the organic matter which constitutes nervous

tissue, considered simply as matter it consists merely in complicated groups of atoms arranged in a certain way. Materialism has never given any valid explanation of the manner in which these psychic qualities can arise spontaneously by mere arrangement of atoms in non-living matter. On the contrary, powerful arguments can be put forward, as shown by Professor William McDougall in his book, *Modern Materialism and Emergent Evolution*, that no atomic mechanism or structure can give rise to the purposive psychic qualities exhibited even in the most rudimentary form of animal life.

There is evidence that though nervous tissue and brain are closely associated with, and perhaps the necessary instrument of intelligent purposive action, the extent of this intelligent action is by no means co-extensive with, or entirely dependent on, the bulk or completeness of the brain for its exhibition. Experiment has shown that in mammalian animals large portions of the brain can be removed without absolutely destroying intelligent action.

Thus Dr. J. K. Lashley trained rats to run through mazes to get food or escape from confinement. Then when they had learnt lessons, small or large portions of the cerebral hemispheres were removed. Although this impaired in some degree their intelligent action it did not wholly destroy the power of learning or remembering. There is some evidence that the same is true of the human brain.

There is an amusing anecdote in the reminiscences of the eminent physician, Sir James Crichton Browne, to this effect.* An army officer had been kicked on the head by a horse and greatly injured. A great surgeon, Sir Frederick Treves, had operated on him successfully but found it necessary to remove a portion of his brain. Years later the officer came to call on the surgeon and suggested that perhaps he had forgotten him. "Oh, no," said Sir Frederick, "I remember you quite well, and that I was very much concerned for your future owing to the amount of your injured brain I had to remove."

"No need to worry about that," said the officer; "I am now in the War Office and head of the Intelligence Department."

Then again, McDougall draws attention to some unquestionable results of telepathy or thought transference and also to those results of psychic research which after eliminating all

* *What the Doctor thought* (E. Benn, London).

doubtful or fraudulent instances seem to give evidence, difficult to explain in any other way, that mental operations are not wholly connected with the brain, but extend beyond it or are independent of it, and that mind can influence mind without physical interconnection.

The only attempt to give even a mere verbal explanation of the mode of origin of psychic qualities, so utterly different in nature from physical, in the same material substance is by the theory of Emergent Evolution.

3. *Emergent Evolution.*

This now fashionable hypothesis may be briefly expounded as follows:—

We know that if hydrogen and oxygen gases are mingled in a volume ratio of 2 to 1 and an electric spark made in the mixture the separate gases combine to form water. The physical properties of the liquid water are quite different from those of either of the gases hydrogen and oxygen. The properties of water are hence said to *emerge* from the combination. In the same way it has been suggested that when a certain complexity of composition has been reached in certain chemical substances, called organic colloids, the properties of living matter may emerge. Also when nervous tissue has reached a certain degree of structure and complexity Mind is said to emerge. But these statements merely make words do duty for ideas and are not true explanations. The properties of water may be different from those of the constituent gases, but they are essentially physical properties and nothing more.

It is quite reasonable to assume that if we knew fully the nature of atoms of hydrogen and oxygen we should be able to predict the properties of their combination as water. On the other hand, the properties of living matter differ absolutely from those of non-living matter. The latter has inertia, that means cannot set itself in motion or change or direct its own momentum.

Living matter can set itself in motion. Again living matter can select or chose from the surrounding medium appropriate nutriment, if this exists, and assimilate it and transform it into new living matter and hence grow. Finally living matter in its lowest forms can multiply itself or procreate. There is nothing in the world of non-living matter anything at all

resembling this spontaneous and self-directed motion, selective assimilation, and continued multiplication, or generation, which characterizes the lowest form of living material. We have never been able to produce living matter from non-living substances of any kind. Just as the non-living is separated from the living by an hitherto impassable gulf, so we encounter another one in passing from Matter to Mind.

Mind must be present in some degree whenever living matter performs actions that are teleological—that is have an end or purpose in view, and we have not the smallest warrant for the assumption that atomic mechanism is capable of achieving this purposive action or that it can spontaneously emerge from inert matter of any kind.

Purposive action essentially implies an anticipation by present action of the results or consequences of certain events which have not yet appeared but are still in the future.*

Memory implies a recalling of some event or experience in the past. Both of these imply that there is in mind a power to move forwards or backwards along the time axis and that it is not held firmly in the grip of the present moment. In contrast with this we notice that in the case of Matter its motions are the result of the forces acting on it at that instant, and there is nothing in physical phenomena of the nature of anticipation of future events. Hence we have strong reasons for the opinion that all the attributes of Mind are different *toto caelo* from those of Matter, and that we cannot have these absolutely different attributes inherent in or characteristic of a single entity.

4. *Determinism versus Free Will.*

Up to the present physicists have generally either openly or tacitly assumed that at least in the region of physical phenomena a rigid determinism holds sway. This means that every event or state at the present is precisely determined by previous states, and that if we knew these conditions and states exactly we could always predict the result. From this point of view there is no such thing as chance, choice or miracle, there is merely ignorance on our part of the agencies operating. Thus, when

* Thus a squirrel hides and stores his nuts in Autumn not because he is hungry then, but because he knows by instinct or experience that there will come a Winter when there are no nuts on the trees and when he will be hungry.

we make a throw with the dice we commonly attribute the result to chance. But the determinist says No! If we knew the exact nature of the dice, their exact position in the dice box, and the forces that operate on each when the throw is made we could predict precisely what the result of the throw would be.

The modern materialist anxious to abolish any dualism in philosophy and to explain the phenomena of the Universe by a satisfying Monism extends this determinism to the world of living organisms and declares that here also a fixed determinism holds the field and that there is no such thing as free choice or free will. When that assumption is carried to its logical issue it implies that there is no basis for moral responsibility. If there is no power of choice of actions there can be no sense in awarding praise or blame for them, or calling one action good and another evil. But however much the materialist may argue, we cannot escape from the inner consciousness that we *can* select or chose and that we have the power within ourselves of deciding which motive shall prevail. It is perfectly certain, however, that each choice made makes it easier to chose in the same manner next time and more difficult to chose in an opposite way. Hence choices produce habits, habits produce character, and character brings destiny.

It is a curious and important fact, however, that the most recent advances in physics have rendered it doubtful, to say the least, whether rigid determinism does exist even in the region of physics. This principle implies that the exact state of every particle of matter, or we may say of every electron or proton, as the constituents of atoms, should be capable of being precisely specified at any instant.

Heisenberg has pointed out that this is an impossible thing. We may, for instance, specify the position of an electron at any instant in some frame of reference, but then we cannot specify its motion, for motion implies continual change of position. Or if we specify its motion at any instant we cannot certify its position, for a definite position implies absence of motion. Hence we now recognize a "Principle of Indeterminacy" which enters into all physical specifications. There is therefore a limit to the accuracy with which the state of any physical system can be defined, and this fact cuts the ground from under the doctrine of strict determinism even in the region of the inorganic or non-living world. Much more then is it non-existent in the world of living

matter, for it is of the very essence of such living matter that it should be able to adapt itself to new and unexpected conditions and surroundings as the latter arise. It therefore has an adaptability or resource and that implies teleological operation or causation. That type of philosophy which assumes the existence of strict determinism in the inorganic world and also seeks for a mechanistic explanation of the phenomena of living matter denying the existence of choice or free will is now shown to be fundamentally unscientific and inconsistent with ascertained physical principles. The Universe is not then wholly mechanistic nor strictly determined.

In a book by H. V. Knox called *The Will to be Free*, the author has shown by resistless argument that the attempt to establish a universal determinism is in itself an exhibition of free will and the assumption of a rigid necessity an act of free choice. Hence the theory of Determinism contradicts itself not only in the organic but even in the inorganic world. That being so the way is open for the discussion of the question which is the main subject of this essay, namely, whether in the world of inorganic or physical phenomena we can find such evidence of purposiveness or adaptation as to compel us to admit that behind all the apparently spontaneous or automatic processes of Nature there is the operation of a Supreme Purposive Intelligence and Will or Mind.

5. *Evidences of Purposiveness or Adaptation in Nature.*

In selecting some examples which seem to give strong indications of definite adaptations in Nature proceeding from purposive thought I have chosen these as far as possible from the inorganic, or rather non-living realms of Nature. The reason for that is that if we put forward any instances of supposed special adaptations in individual cases in the world of animal or vegetable life, the evolutionist dismisses them as irrelevant or inconclusive on the ground that they are not specially purposive but only the outcome of a general tendency of natural selection to produce those organs or operations which favour the survival of the fittest in the struggle for life. The line of enquiry here chosen then is to search for instances in Nature of those kinds of economy or procedure which on a smaller scale in our human work indicate clearly intelligent purposive thought. The materialist will not

hesitate to condemn such an idea as anthropomorphic or the endeavour to liken what Herbert Spencer called the Unknowable First Cause to a human mind. Those of us, however, who believe that Man was created in the image of God interpret this to mean that in Man there are mental and spiritual qualities which are a faint reflection of similar but far more transcendent and infinite attributes in the Creator.*

We see, then, no reason to reject a line of investigation which may enhance our faith in this Supreme Purposive Intelligence and counteract the prevailing tendency in modern thought to reject the fundamental truth of the Personality of God. Suppose, then, that we first define those broad characteristics of any human constructional work which indicate thought, contrivance, or good management, and endeavour to discover if there are any analogous characteristics in Nature outside of ourselves which must similarly be the product of superhuman intentional design or thought and not mere chance. An essential mark of intelligence in human work is economy of time, effort, or material and achieving any desired result in the simplest and most effective manner. In human manufactures of all kinds it requires very considerable thought and design to avoid waste

* Although the theory is widely held that Man was developed by natural selection from an animal stock, one branch of which started to develop progressively into the human family whilst others remained less progressive and gave us the anthropoid apes, the evolutionists have never yet given us a sufficient reason for the remarkable and unique development of this one branch.

It is interesting to notice that our eminent anthropologists now and again let fall hints that the theory does not seem so sound as its popular exponents, even those who advocate it from the pulpit, would have us believe.

At the meeting of the British Association at Bristol in 1930, Dr. H. S. Harrison, in the Anthropology section, put this doubt in neat epigrammatic form. He said: "Man did very well before he was a man at all, and no one has yet given any reason why he ceased to be an ape."

The Biblical teaching of the Divine creation of Man has not yet been adequately improved upon.

Unless the accounts of the miracles of Christ in the Four Gospels are pure fiction we have there the proof that instant creation by Divine Power is possible. Christ converted water into wine instantly. He multiplied bread and fish to feed thousands instantly, and more than once created instantly shoals of fish in a lake at a place where there were no fish a moment before. If this was possible to the Incarnate Son of God, why could not the Divine Logos by whom all things were made create instantly a perfect Man Adam as the progenitor of the human race?

of time in the manufacture of articles or passage of persons from one place in the factory to another and the same in all well-managed undertakings.

We find exactly the same economy in time in Nature. For instance, a ray of light in travelling from one place to another, no matter how many times it may be reflected or refracted, does its journey by its own selected path in less time than it would do if compelled to take any other path selected for it. This principle of *Least time* in optics enables us to solve an immense number of optical problems and discover the actual path of a ray of light in particular cases. There is an analogous principle in mechanics called the Principle of Least Action.

The word Action is a technical term which means a product of time and energy. When a planet moves in its orbit round the sun, if we subdivide the time of passage between two points into short elements and multiply the numerical value of each small interval of time by the energy of motion during that time, the sum of all these products is called the Action. This action for the planet's actual path is less than it would be for any other constrained path between these two points with the same energy. There is therefore a certain kind of economy in Nature not merely of time or energy alone but of their product.

This principle of Least Action is one of the most fundamental in the science of dynamics. It is impossible to see how it can have arisen by mere chance and without some deliberate and purposive thought. Then in the next place there is another mark of design and good management in human manufactures, and that is the avoidance of waste of material or the utilization of waste products. If this is not done there may be an accumulation of some material which is injurious, or a waste of some other which is useful. Thus, in the manufacture of candles in old days from animal fat, a substance called glycerine, which occurs as a by-product, was considered to be useless and thrown away. Then it was discovered to have important uses in the arts and particularly in making a high explosive called nitroglycerine and it is now no longer a waste product. In the same way in the manufacture of common washing soda from salt there is a by-product called hydrochloric acid gas which was formerly allowed to escape into the air to the great detriment of surrounding vegetation. Then it was found that it could be used to prepare another very useful gas called chlorine from which bleaching powder is produced. In all modern

manufacturing processes great thought is given to the elimination of waste products by making the waste product of one stage the raw material of another stage of manufacture.

We find exactly the same kind of economy and adjustment in great natural phenomena. The animal races almost without exception have to breathe in oxygen gas either taken from the atmosphere or from air dissolved in water to oxygenate their blood and provide energy for motion or for heat by the combustion of tissue. The result of this is that they breathe out or expire a gas called carbon-dioxide, and water and other waste products. Our atmosphere consists one-fifth of oxygen, four-fifths of nitrogen, and about three or four parts of ten thousand of carbon-dioxide, with small quantities of five or six other rare gases. Hence as far as animals are concerned there is a continual drain on the oxygen in the air and an accumulation of carbon-dioxide. If this latter gas accumulated in the air beyond a certain limit it would be fatal to the life both of animals and plants. But the plants provide a compensation. Plants absorb the carbon-dioxide and water and under the action of sunlight and by the aid of a material called chlorophyll which exists in the green parts of plants they give out oxygen and build up the starch, sugar, cellulose, and woody fibre, and other materials which provide food for animals. Also other waste products of animals fertilize plants. We see, therefore, a most exact and useful adjustment to prevent accumulation of carbon-dioxide in the atmosphere, the excess of which would be deleterious to animal life. This cannot be the result of chance.

Another characteristic of human work which always requires purposive thought is the question of size. When you resolve to build a house for yourself the first question which comes up is size. If you make it either too large or too small it may become inconvenient or impossible for you as a dwelling-place. Our earth is the dwelling-place of animals and plants and we have seen that they both require an atmosphere in order to live which must contain oxygen and carbon-dioxide gases. Also water must be present in liquid state. Curious to say, the constitution of this atmosphere depends on the size of the earth and its gravitational force.

If a rifle bullet were shot from a gun vertically upwards it would generally fall back again on the earth. If it could be shot upwards with a speed of rather more than 7 miles a second it would not fall back but go off into space. This critical speed

at which a projectile would just escape from the grip of a planet depends on the square root of the product of the diameter of the planet and its gravitational force. Thus for the Earth it is 7 miles per second, for the Moon $1\frac{1}{2}$ miles, for the planet Mercury about $2\frac{2}{3}$, but for the Sun 350 miles per second.

If a planet is surrounded by an atmosphere the molecules of it are darting about in all directions with various velocities. If the gases of that atmosphere have small atomic weight and therefore move very quickly like Hydrogen or Helium atoms, they will easily escape unless the planet is very large. If the planet is small, then even denser atmospheric gases like oxygen will escape from it. This is the reason why the Moon and the planet Mercury have no atmospheres. They are too small to retain the molecules of gases. On the other hand, very large planets like Jupiter would retain too much of the heavy gases as well as water vapour and carbon-dioxide gas.

The upshot of the matter then is that in order that a planet may retain an atmosphere of Oxygen, Nitrogen, Carbon-dioxide and water vapours in the proportions necessary for the maintenance of animal and vegetable life as we know it, the planet must be of a certain size and density.

Now the Sun has only eight planets, four of which are giants and four are dwarfs. Of these latter only one, namely, the earth, has that size and atmosphere fitted to maintain animal and vegetable life as we know it, although perhaps Mars may not be very dissimilar. Can we say that with so few planets this is the result of mere accident or chance and that it is not the outcome of Purposive Thought? In fact the Solar system taken as a whole seems, in the opinion of many leading astronomers, to be of a very unique or special character. Eminent astronomers, such as Eddington and Jeans, have strongly expressed their views that the Solar system is an unusual structure not perhaps repeated elsewhere in the universe of stars. Other popular but less exact writers have even called it a "freak." If that is the case then it cannot have been the outcome of evolution or any normal operation. It is far more probable that, even if it was brought into existence by the near approach of two stars, it is the direct result of a Purposive Thought, rather than a mere accident or chance. In short it is a definite creation and not a spontaneously produced collocation of Matter.

There is another very significant fact in the material Universe, namely, the atomic structure of Matter, and the fact that there

are not an infinite number of different kinds of matter, but only varieties produced by the combinations of a very limited number of elementary substances. There is a close analogy with the invention of alphabetic writing by intelligent man in this respect.

Writing began simply in the effort to make marks on stone or clay imitating the outlines of various objects. These then became corrupted or simplified to save trouble and were reduced to very numerous ideograms standing for various objects, say for man, ox, bird, water, etc. The Chinese written characters are, and the Egyptian hieroglyphics were, of this nature.

A very great advance was made by the invention of the alphabet, so that the juxtaposition of a few elementary signs or letters taken from a relatively small collection of about two dozen or so, did duty for an immense number of separate ideograms.

We find a very similar thing in Nature. There are hundreds of thousands of different substances, but any or all are found to be made up by the union of a certain number of different kinds of atoms about 90 in number which constitute the alphabet of material substance. We can imagine a physical Universe consisting merely of one kind of substance or one consisting of a multiplicity of different but unrelated substances, but when we find everything formed of molecules or little groups each built up of a selection from a small number of unitary substances it is impossible that they should have been the result of mere accident and equally certain that it is not due to our own imagination. It gives evidence of purpose and design just as much or more than the invention of alphabetic writing by man.

This is confirmed by the discovery that there is a regular progression of structure in these elementary atoms.

When a number of articles like screws or drills have to be made of various sizes we always aim at "standardizing" the articles so that all of one size are exactly alike and the sizes increase by regular and fixed steps.

In old days each engineer or mechanic made his own screws of any size he pleased. Hence screws by different makers were not interchangeable and great trouble ensued. Sir Joseph Whitworth introduced the manufacture of standard screws exactly to size, and the same process was continued by the British Association for small screws. This required considerable thought and design. There is now an important body called the British Engineering Standards Association which controls

this standardization of all engineering products or manufactured articles.

Now we find the same standardization in atomic structure. Material atoms are built up of particles of electricity called protons and electrons. An atom of hydrogen consists of 1 proton and 1 electron circulating round it. An atom of helium consists of 4 protons and 2 electrons built up into a nucleus and 2 planetary electrons revolving round it. An atom of lithium consists of 7 protons held in a nucleus by 4 electrons and 3 planetary electrons circulating round it. So the planetary electrons increase by 1 at each step until we reach the atom of Uranium with 92 such electrons. Each atom of the same kind is perfectly identical and the structure and properties of each size increase in a periodic manner. Here, then, we have standardization of the same character as that which indicates intellect in human constructions, and we therefore can hardly deny that the exhibition of similar characteristics in atomic structures implies also a design and therefore a Designer.

6. *Beauty as Evidence of Purposive Thought.*

Lastly, there is a characteristic of good human work which unquestionably involves purposive thought and that is in the production of articles which have beauty as well as utility. Beauty is a difficult thing to define, and different ages, races, and persons have different ideals and standards. The love of natural scenery and its beauty is perhaps a modern acquirement, but hardly any race of men are so stolid as not to feel some joy in the colours and form of flowers, and the foliage of spring, the russet tints of autumn, or the beauty of a fertile valley in the summer sun. We recognize beauty in the form and colour of some human bodies or faces and in the structure of certain plants and animals. It is then a mark of intelligence in human work to bestow beauty upon that which is primarily intended to be useful.

A house, a bridge, or a tower may serve its purpose and yet be ugly, but we admire the purposive thought which gives beauty to it as well. In Nature we find the most exquisite beauty associated with utilitarian purposes.

Consider, for instance, the familiar substance, water. It has

a marvellous collection of useful properties. It is tasteless, non-inflammable, chemically neutral, that is neither acid nor alkaline. It is an almost universal solvent and is essential in the formation of those organic colloids which form the main part of the bodies of animals and plants. It has a moderate boiling point and also not very low freezing point, and passes into the solid condition as ice and gaseous condition as steam at temperatures well within the range of terrestrial temperatures. It has also the very peculiar property of a temperature of maximum density. Nearly all substances when cooled contract in bulk. Water taken, say, at 60° F. and cooled contracts in volume and therefore increases in density. But now at about 39° F. it ceases to contract and if cooled still more expands and gets less dense and on passing into the condition of ice it expands again still more. It is then said to have a maximum density at 39° F. No other substance except liquid helium at a very low temperature has this same property. The importance of this in the economy of Nature is very great.

Consider, for instance, a lake or pond during a long frost. The surface layers of water cool first, get denser and sink down, and this process goes on until the whole of the water has been cooled to 39° F. Then at any further cooling of the surface layers they do not get denser but lighter and remain on the top. On passing into the solid condition the surface layers expand still more, and hence only a layer of ice forms on the surface.

If the water continued to contract after reaching 39° F. the whole lake or pond would be converted in a long frost into a solid mass of ice and all aquatic life in it would be destroyed. As it is fish and other aquatic animals are not hindered from moving about in a pond frozen only on the surface but with liquid water below at 39° F.

Consider again the exquisite beauty associated with water in various forms. As clouds, which consist of minute drops of water, their endless forms give us a daily spectacle of delight. The light which has passed through great lengths of air as at sunrise and sunset has been largely deprived of its blue rays. Hence the red and orange rays predominate and when they fall on clouds give us the supremely beautiful tinted effects of sunrise and sunset. Then as a liquid, water presents itself in Nature as streams, rivers, lakes, waterfalls, and the sea.

All the artistic power in the world has failed to do justice to their continual beauty. As a solid, water in the form of snow

and ice gives us the unending delight of snow-covered mountains, glaciers and icefalls and all the joys of winter scenery. Hence we see that the most useful substance in the world is also one with which the greatest beauty is associated. We never find in human workmanship that beauty comes by chance. We cherish, therefore, all artistic skill because it is so rare, and the power to create beauty depends essentially on purposive thought. What right have we then to deny that behind the transcendent beauty of the physical world there must lie the Purposive Thought of an Eternal Mind ?

7. *Possible Objections and Conclusions.*

The above-mentioned instances of phenomena and adjustments in Nature which strongly suggest teleological operations will no doubt be convincing only to those who approach the subject with an open or willing mind.

The sceptic and rationalist would doubtless hasten to point out that we have selected the facts which suit our thesis but not brought to notice many that on the surface seem to tell against it.

On the one hand we have the instances in which intelligent economy of material, time and effort seem paramount in the operations of Nature, but against this we must set certain others where there seems to be a lavish waste or cruelty. For instance, how prodigal is the waste of seed and germ in the procreation of vegetable and animal life ? Tennyson sings :—

“ That I considering everywhere
Her secret meaning in her deeds,
And finding that of fifty seeds
She often brings but one to bear.”

In place of “ fifty ” the poet might well have written “ fifty thousand ” or “ fifty million.”

This waste of nascent or germinal life seems, however, necessary in connection with that struggle for existence which preserves the vigour, efficiency and trueness to type of the various vegetable and animal species. If it were otherwise, the earth might be over-populated with imperfectly developed forms of life,

inefficient because existence has been made too easy for them and competition eliminated. The individual, however, counts for little in comparison with the species :—

“ So careful of the type she seems
So careless of the single life.”

A far more difficult question is, however, presented in connection with the vast and often relentless destruction of human life. An earthquake or a flood may sweep to death thousands of healthy human beings young and old, useful or useless, good or evil lives. In face of such heartrending tragedies the human reason alone is helpless, and groping in the dark finds it almost impossible to hold to the belief in a God whose “ tender mercies are over all his works ” (Ps. cxlv, 9).

If the present life is all that existence has to offer and if the death of the body ends everything, then we might indeed despair of finding any solution of these inscrutable mysteries of human life. If, on the contrary, physical death is but the gateway to a higher form of life, then there may be compensations and adjustments which will rectify and justify all premature loss and disaster here.

It has not uncommonly been assumed, although perhaps not now so much as in a former age, that the human intellect is capable of unravelling and comprehending all the secrets of physical nature. But when we come to the problems of life and mind and those intricate questions which concern the objects of human life and its destiny we find that the intellect alone is insufficient to deal with them.

That Man with his great powers of mind who has been able to explore with his telescopes the structure of the heavens and penetrate by his researches even the mysteries of the atom should be the helpless victim of the remorseless forces of Nature and carried apparently into nothingness when at the height of his powers, is a problem that has infinitely perplexed and overwhelmed the greatest souls.

Tennyson has given expression to this thought in words of perfect form :—

“ Man, her last work, who seem'd so fair,
Such splendid purpose in his eyes,
Who roll'd the psalm to wintry skies,
Who built him fanes of fruitless prayer,

Who trusted God was love indeed,
 And love Creation's final law--
 Tho' Nature, red in tooth and claw
 With ravine, shriek'd against his creed--
 Who loved, who suffer'd countless ills,
 Who battled for the True, the Just,
 Be blown about the desert dust,
 Or seal'd within the iron hills ?
 O life as futile, then, as frail !
 O for thy voice to soothe and bless !
 What hope of answer or redress ?
 Behind the veil, behind the veil."

—*In Memoriam.*

Though the intellect alone can find no answer, faith can shed a ray of light which helps to dissipate the gloom and enables us to see a Guiding Hand. This seems to be the moral of that remarkable piece of ancient literature the Book of Job. Upon the head of Job, a man of apparently irreproachable virtue, descended an avalanche of misfortune. His three friends, Bildad, Zophar and Eliphaz, assured him in so many words that he must have deserved it and that virtuous as he might esteem himself, in the sight of God he was not perfect but must be guilty of some sin.

Job stoutly resisted this accusation. Then came Elihu the Buzite of the kindred of Ram, and the general tendency of his advice was the futility of resisting the Actions and Will of God. Lastly, God Himself appears upon the scene. He did not reproach Job with his unbelief or rebellion or charge him with any sin, but He took Job, so to speak, a tour through the Universe and made him see the Infinite Wisdom and Wonder and Power of it all. The effect of this on the mind of Job was to produce a state of profound humiliation, and conviction that God can make no mistakes in His government, but that behind the dark clouds of sorrow there must be the sunlight of Infinite Wisdom and Power. He then exclaims:—

“I have heard of Thee by the hearing of the ear : but now mine eye seeth Thee. Wherefore I abhor myself and repent in dust and ashes.” (Job xlii, 5, 6). When this state of mind had been reached the lesson Job was intended to learn had been acquired and all his former prosperity and comfort was restored to him. Hence, the conclusion of the whole matter seems to be that

there are powerful and unmistakable indications in Nature of Purposive Thought and of Order and the Adaptation of means to an end which cannot be the result of mere chance or of impersonal agencies or principles such as those included under the term Evolution, but must be the product of a Supreme Intelligence. On the other hand, the proof of teleological action is not so complete as to convince us without fail. It is not given to us in a form which admits of no reply like a mathematical demonstration. It is sufficient to support and buttress faith, but not to supersede it. It will not intellectually force the Will. Unless we are willing to carry out to its logical issue the truth as far as it is given to us, the intellectual proof will not seem sufficient.

It appears as if the freedom of the Will or power of free choice within limits is the most characteristic and precious of human faculties. Nothing must therefore be done to overcome it, because without free Will Man is reduced to the condition of a machine. There must then be a co-operation of the Will with the Intellect if a state of mental certitude is to be reached on spiritual problems. That seems to be the meaning of the utterance of Christ in John vii, 17, "If any man will do His will he shall know of the doctrine whether it be of God or whether I speak of myself." Here the words "will do" are not simply a future tense but in the Greek are *Thelē*, which might be properly translated "is willing to do." There is a type of certitude that can arise in the mind on these questions of religious truth which is not wholly the result of ratiocination, but comes as the result of a venture of faith.

As the poet Whittier well has said :—

" Nothing before, nothing behind,
The steps of Faith
Fall on the seeming void and find
The Rock beneath."

DISCUSSION.

The CHAIRMAN (Dr. Thirtle) said : I am sure you all share the satisfaction that I myself have felt while listening to the paper read by the honoured President of the Institute. During recent years Sir Ambrose Fleming has delivered in our hearing a series of lectures of great and abiding value, every one of them furnishing evidence of

scientific and philosophical resource, boldly placed at the service of the higher and deeper interests of life. Now, once more, he has shown with marvellous force and clearness that spiritual thought is not ruled out by profound culture, and that a command of the facts and principles of scientific observation in the world of Nature are not out of harmony with truths that are basal to faith and piety.

Time and again Sir Ambrose has come to us with addresses that supply a buttress to what we regard as the truths of Divine revelation. Now, once more, he has presented before us an utterance of great strength and essential importance; and we rejoice to note that, in various references and allusions, he is able to quote the support of learned men, widely known as investigators and exponents of things that are high above the thought of some who glory in new and untried theories—theories which, as we have reason to believe, are in reality unprovable and practically worthless.

The lecture to which we have listened knows nothing of the blatant and flippant; rather, with restrained words and force of sober argument, Sir Ambrose has set forth the findings of profound thought and long-continued contemplation; and we thank him for an unanswerable statement of the grounds of confidence, that things observed in the phenomena of Nature issue from Mind as it resides behind Matter, and gives expression to the Being of God.

We listened with special interest to the early sections of the lecture, in which important definitions were established, and the way made clear for distinguishing the realms of Mind and Matter, as the same are represented in the world of thought; even as we followed with sympathy the expanding argument designed to show that the Biblical teaching of the Divine creation of man has not yet been improved upon by modern speculation. Theorists who have conjured up other explanations of the human creature, his coming into being and his mundane experiences, show, for the most part, a profound ignorance of Bible doctrine on these subjects. It is comparatively easy to write up a speculative point of view, and to extol its excellence, if at the same time, through ignorance or prejudice, one arrogates authority to cry down a time-honoured doctrine because found to stand in the way of mushroom conceits.

From first to last the lecture has commanded the sustained attention of those who have listened; and that Eddington and

Jeans could be named as virtual supporters of a doctrine of creation—showing that the Solar system is an unusual structure, not perhaps repeated elsewhere in the Universe of stars—supplies a welcome foil to the writings and words of men who have wantonly ruled out Purposive Thought, and maintained that the Universe is a spontaneously produced collocation of matter, the outcome of a Godless Evolution.

I need not go over the ground that has been covered, at once so carefully and so convincingly, by Sir Ambrose in his lecture beyond remarking that we must all have welcomed with deep satisfaction “the conclusion of the whole matter,” as it was shown before us, that in the world of Nature there are unmistakable indications of Purposive Thought and of consistent order, with the adaptation of means to an end—conditions which cannot be the result of mere chance, or of impersonal agency, or principles such as those included under the term Evolution; but rather must be the product of a Supreme Intelligence, as the Christian Faith demands. Both as a scientific investigator and as an exponent of the precious things of faith, Sir Ambrose has come before us with a truly powerful utterance, for which we accord him our sincere thanks.

The Chairman moved the usual vote of thanks, which was accorded with acclamation.

Lt.-Col. F. A. MOLONY said: It would be a pity to let such an excellent lecture pass without comment. Needless to say, I agree with all that our learned President has advanced, but would like to add a few remarks to what he said about earthquakes at the top of p. 29.

Sceptics argue that an earthquake, which kills good and bad alike, cannot be reconciled with the providence of a loving God. I was at Corinth within a year of the last great earthquake there. The town still lay in ruins; but in the middle stood a large brick church, which I examined carefully. It had been violently shaken, and was cracked in many places from top to bottom, but none of its many arches had failed, though one had dropped about a dozen bricks. I do not imply that it alone stood among the fallen buildings because it *was* a church. I rather concluded that it stood because it was built of good honest brickwork, with true horizontal and

vertical joints, whereas the rubble masonry around had many inclined joints, and to that extent was weak.

I came to the conclusion that the terrible death-roll which we so often hear of in connection with Italian and Grecian towns and villages, which have been shaken by earthquakes, is really due to bad building. A sceptic, however, might reply, that my argument does not apply to Japan, where the people have long tried to erect structures which shall be as little dangerous as may be when earthquakes occur. Yet, in the great Tokio earthquake many thousands met a horrible death.

To such an argument I think I would reply that we who live safe from earthquakes, here in England, are scarcely in order in raising this matter as an argument against belief in the loving providence of God. If God justifies His ways to the Japanese Christians, what right have we to interfere? I have spoken to several missionaries from Japan on this matter, and all have agreed that the sufferings of the Japanese from earthquakes do not shake their faith in the love of God.

Mr. AVARY H. FORBES said: Among phenomena classed as "spasmodic, capricious" etc., Sir Ambrose places the "weather generally." I should substitute "invariably" for "generally"; for, although there is probably no phenomenon in Nature about which physicists are more certain that it is simply and wholly a matter of cause and effect than the weather; yet no connection between the two can be pointed out. Every meteorologist is clear as to the causes: the sun's heat, its size, its distance, the earth's size, its surface, its rotation, its revolution, its polar obliquity, its elliptical orbit—the last two, however, being responsible for the seasons rather than the weather.

Now, as all these "causes" are constant and invariable, and can be predicted for any particular day, how is it that the weather is not the same as on its anniversaries in the past? Take the first of June in this year; were not the sun's size, heat and distance, the earth's size, surface, rotation, revolution, obliquity, and its position in its orbit, precisely the same as they were on June 1st last year? How comes it then that the weather on June 1st one year is cold, wet and stormy, while on June 1st in another year there is not a

cloud in the sky, and the heat is almost unbearable? I call to mind, not a day merely, but almost the whole month of August, when the weather was very cold, squally and wet; and when the following December was so extraordinarily warm, that primroses and (I think) strawberries were flourishing.

Within the tropics the "causes" are much more pronounced, and there the weather and climate are much more regular. How is it then that the monsoons sometimes fail, with such disastrous effects in India? To attribute these eccentricities to "sunspots," simply means "we know nothing about the matter." I leave out as "causes" the planets and the moon; for whatever influence they may have in the matter of gravitation, they can have none whatever on the temperature of the earth. But when I turn to Scripture, I find that the weather is always referred to as sent as a reward or a punishment—a reward for obedience to God, and a punishment for disobedience. And it seems to me that no other explanation fits the circumstances even up to the present moment.

Mr. G. WILSON HEATH, M.I.Mech.E., after expressing warm appreciation and hearty thanks for the paper, said: It has occurred to me that the paper draws a somewhat too rigid, too sharp, too unbending line between *animate* and *inanimate* matter (p. 17). A paper in a recent issue of the *Scientific Review* gave the elaborate results of the retesting, after ten years, of the Imperial Weights and Measures at the National Physical Laboratory at Teddington. Among other strange movements, shall we call them, of inanimate matter, the paper states that the Measures made of INVAR metal had in a very appreciable manner "*grown*" in bulk and weight. We may most of us be aware that INVAR metal is used for such purpose because it is not affected by either heat or cold, that is to say, it does not expand or contract. Further, His Majesty's Stationery Office have issued a paper on the same subject, giving interesting details and stating that certain weights had become appreciably *less* in weight and bulk. It therefore would appear that processes or movements are going on continually all around us in what we call "*inanimate*" matter, which I suggest should have recognition.

A cure has been suggested for this instability of "*inanimate*" matter so that our measures might be stabilised, namely, abolish

INVAR and use specially hardened steel, or steel so hammered that all the life is knocked out of it. I merely mention this to prove how "animate" is that which we (it would seem rather loosely) call "inanimate."

With regard to "free will" (p. 18), may I say that it has been affirmed by theologians of undoubted spirituality, that there is no such thing as "free will" in either heaven or earth, for God's Holy Will is governed by what He is essentially, "love," and man's unrestrained and unregenerated will, by "lust." I gather from this, that it is only when "the love of God is shed abroad in the heart by the Holy Spirit," that man's will and God's will are at one, or in any wise can coalesce.

WRITTEN COMMUNICATIONS.

From Mr. W. R. ROWLATT-JONES: That "well of English undefiled" the Englishman's Bible is occasionally clouded by faulty translation. On p. 15 the question "If a man die, shall he live again?" could never have been asked by the Divinely inspired Job. But here we find him correcting a popular error: "Thinkest thou—If a man die shall he live again? All the days of my appointed time will I wait until the (great) change comes."

Job is thinking of the intermediate state in *Sheol*. This is, therefore, one of the great Resurrection texts of the Old Testament.

Rev. J. J. B. COLES, M.A., wrote: We who, in common with other students, adopt inductive methods of scientific inquiry and the comparative study of phenomena, and who *also* accept a Divine Revelation from God as to all questions of origins and of the future destiny of men, are in a much stronger position than those who argue on Evolutionary lines alone. The advanced science of to-day has nothing to teach us as to origins or as to a future life; thus demonstrating that a true synthesis of knowledge can never be obtained on Evolutionary lines alone.

Side by side with our admiration of the beautiful and sublime in the "Purposive Thoughts" in Nature, we Christians do not forget that we are living in a fallen world, and that "the whole creation groans and travails in pain until now" as we wait for "the redemption of our bodies." Moral evil was brought into this beautiful creation by sin and transgression on the part of the

creature. The subject of the prologue to the Book of Job was not made known to the patriarch himself—this prologue tells us of evil thoughts in the spiritual world. That same evil still persists. There will be a great outburst of sin and evil before the return of Christ to enter on His glorious reign of righteousness.

In his foreword or preface to the *Mysterious Universe* Sir James Jeans tells that he is “a stranger in the realms of philosophic thought.” Members of the Victoria Institute are not quite strangers to philosophical reasoning. We know well that Personality, Human and Divine, is the leading or central point in all Philosophy. Thought travels faster than light, and thought-waves have a “medium” as well as light and sound. Philosophy uses reason and reason “argues from premises,” as Professor Sir Arthur Eddington reminded us in his recent address on “Science and Religion.” Philosophy uses deductive logic as well as the inductive reasoning of Modern Science. Man has a Revelation from God and all God’s Truth centres in the Person of Christ “by whom all things were created, and who upholds all things by the Word of His power; by Him all things consist.”

THE LECTURER’S REPLY.

Sir AMBROSE FLEMING wrote: I do not think it will be necessary for me to add much to the discussion, except to thank cordially the members of the audience for their kind reception of the paper, and especially to thank our Chairman, Dr. Thirtle, for his very kind remarks in his vote of thanks.

I am quite in sympathy with the opinions expressed by Mr. Avary H. Forbes in his speech. Having regard to the enormous influence of weather upon the welfare and even life of humanity, I do not think we can consider it controlled by a rigid determinism. In fact, we see the concept of determinism even in physical phenomena yielding to ideas which have their origin in its antithesis, namely, the universal presence of Mind.

As Mr. G. Wilson Heath has remarked, we can find something of life even in metals. It is a curious fact that the re-agents which chemists call catalysts, which are inorganic, can yet be “poisoned” by certain other substances, and so become “dead” or cease to act.

740TH ORDINARY GENERAL MEETING,
HELD IN COMMITTEE ROOM B, THE CENTRAL HALL,
WESTMINSTER, S.W.1, ON MONDAY, JANUARY 5TH, 1931,
AT 4.30 P.M.

SIR AMBROSE FLEMING, D.Sc., F.R.S., PRESIDENT,
IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed, and signed, and the HON. SECRETARY announced the following elections:—As Members: Charles W. Pike, Esq., and Dr. Eliot Curwen; and as Student Associates: Douglas Johnson, Esq., B.A., and Gordon F. Claringbull, Esq.

The PRESIDENT then called on Lieut.-Col. A. G. Shortt to read his paper on "The Fifteenth Year of Tiberius."

THE FIFTEENTH YEAR OF TIBERIUS.

(Luke iii, 1.)

By LIEUT.-COL. A. G. SHORTT, B.A. (LATE R.A.).

§ 1.

IT is very remarkable that, after nineteen hundred years, with all our modern methods of criticism and enquiry, the datings of Our Lord's Life and Ministry have not been definitely determined. The reason, of course, is simple, and lies in an unfortunate clash between the statement in Josephus' *Antiquities of the Jews* that Herod reigned 34 years, and St. Luke's precise dating of the beginning of the Ministry of John the Baptist as occurring in the fifteenth year of Tiberius, coupled with the added statement that Our Lord not long afterwards began to be about 30 years of age, and with St. Matthew's story of the Flight into Egypt as indicating that the Nativity was *before* the death of Herod.

These statements are irreconcilable, though much ingenuity has been brought to bear on the problem, and we must therefore examine them in the light of all available evidence which we can collect.

The words of St. Luke are as follows :—“ Now in the fifteenth year of the reign of Tiberius Cæsar, Pontius Pilate being governor of Judæa and Herod being tetrarch of Galilee, and his brother Philip tetrarch of Ituræa and of the region of Trachonitis, and Lysanias the tetrarch of Abilene, Annas and Caiaphas being the high priests, the word of God came unto John the son of Zacharias in the wilderness ” (Luke iii, 1). That the wording is intended to be precise is obvious. There is no event in Scripture which is more carefully dated. And yet the only part of it from which we can get precise information is the first item, “ the fifteenth year of Tiberius.” On the face of it, it is clear enough. Augustus died on August 19th, A.D. 14 ; the fifteenth year of Tiberius therefore would begin on August 19th, A.D. 28. But as, by Josephus, Herod died in 4 B.C., Our Lord would be more than 31 years of age in A.D. 28 if the Nativity preceded Herod’s death.

We will consider St. Luke first. He was a man of education, a physician, and, as is admitted by all, most accurate in his statements. He claims (Luke i, 2) that his information was direct from eyewitnesses. He is therefore, as a witness, in an extremely strong position. Yet efforts have continually been made to work round the dating he gives. It is said that Tiberius was given equal power with Augustus in the provinces before the death of the latter, as far back as A.D. 11 or 12, but no satisfactory evidence is produced of his reign being dated from so early a time. Those who do not go as far as this say that St. Luke was speaking casually without any special knowledge of any such dating, or may have followed the Roman custom of beginning their year in January, so that the fifteenth year of Tiberius may have begun in January, A.D. 28. Again no evidence is produced, and the wording of the passage shows extreme precision rather than looseness of wording.

To test these arguments there can be no surer evidence than that of coins, and it is proposed to set out below certain coins of Antioch which may assist us. Antioch was the capital of Syria and the headquarters of the Roman rule in that province. These coins, therefore, would circulate all over Syria, including Judæa, and would be well known to St. Luke himself, who is believed to have been a native of, or to have resided in, Antioch.

They are also coins issued by the Roman governors and therefore strictly official :—

Coins of Antioch.

1. Coin of Tiberius marked ΓM (= 43rd year of the Actian era).
2. Coin of Tiberius marked ΔM (= 44th year of the Actian era).
3. Coin of Tiberius doubly marked A (= first year of Tiberius) and EM (45th year of Actian era).
4. Coin of Tiberius doubly marked Γ (= third year of Tiberius) and ZM (47th year of Actian era).
5. Coin of Augustus marked XII (Cons.) and θK (29) year of Victory (Actium).
6. Coin of Augustus marked XIII (Cons.) and θK (29) year of Victory (Actium).
7. Coin of Augustus marked ζΑ (36) and ΔN (54).
8. Coin of Galba marked 117 (from era of Antioch).
9. Coin of Otho marked 117 (from era of Antioch).

For these coins and others reference should be made to Eckhel, *Doctrina Nummorum*, 1794, III, p. 272 ff., and O. Kaestner, *De Aeris quoe ab imperio Cæsaris*, etc., pp. 7–22. T. Lewin's *Fasti Sacri* also will be found most useful for the copious evidences he had collected for the years 70 B.C. to A.D. 70.

The first two are considered doubtful, but our attention is attracted by the third, which equates the first year of Tiberius with the 45th year of the Actian era, and we shall require first to ascertain the date of this era.

The battle of Actium was fought on September 2nd, 31 B.C., and the battle of Pharsalia, which inaugurated the Cæsarean era (the era of Antioch), occurred on August 9th, 48 B.C.

Now Eckhel proves from Nos. 8 and 9 that the Cæsarean era began not in 48 B.C., but in the autumn of 49 B.C., after August 9th in order that this first year would contain the date of the battle. He proves this from the fact that Galba reigned from June 9th, A.D. 68, to January 15th, A.D. 69, and Otho from then to April 16th of the same year (Eckhel, III, p. 282), and as by coin No. 7, which refers to the eras of Antioch and of Actium, there were 18 years between the two, the era of Actium must begin in the autumn of 31 B.C. Now this agrees with the fact that the civil years of the Antiochenes, as of other Eastern nations, began in the autumn, and though, at Antioch, the actual

beginning varied at different times between September and October, yet we have literary evidence (Kaestner, p. 13) from the writings of Lydus (*De Mens.*, IV, 80) that when Augustus defeated at Leucas the Egyptians with Antony and Cleopatra, he introduced the cycle of the so-called indiction from the beginning of September. We may therefore take it that the Antiochene year in 31 B.C., began on September 1st. And this explains the two coins, Nos. 5 and 6, which are both of the year of the Actian era 29 (September, 3 B.C.—September, 2 B.C.), Augustus having been made Consul for the thirteenth time on January 1st, 2 B.C. And, further, following on this last evidence, the year of the Actian era 45 (EM), as shown on coin No. 3, began therefore on September 1st, A.D. 14, and ran on to September 1st, A.D. 15.

But we have yet to deal with the way the years of Tiberius' reign are reckoned, for though the Antiochene year began on September 1st, the years of Tiberius may still have been reckoned from the previous January. Yet this at least is impossible, as the following examples show :—

“C. Asinius and C. Anstitius being consuls, it was the *ninth* year of Tiberius” (Tacitus, opening of 4th book of Annals). This was the year A.D. 23. Were the years of Tiberius reckoned from January 1st, A.D. 14, it would have been his tenth year. So also in the cases given below.

“In the *ninth* year of the reign of Tiberius in the consulship of Asinius Pollio and Anstitius Vetus” (Pliny, N.H., xxxiii, 8). This again is in A.D. 23.

Dion Cassius, LVII, 24, and LVIII, 24, mentions that in the course of the year A.D. 24, ten years of the reign of Tiberius expired, and puts the consulship of Lucius Vitellius and Fabius Persicus (January 1st, 34) in the twentieth year of Tiberius.

Mommsen, again, quotes an inscription at Marseilles, Cil., XII, 406, which is known to belong to A.D. 19, and is dated the fifth year of Tiberius (see *Staatoreckt II*, 3rd Edn., 1887, p. 802).

Tiberius reigned actually for 22 years 6 months and 25 days, dying on March 16th, A.D. 37.

Philo makes it 23 years (Leg. 21).

Clement of Alexandria, 26 years 6 months and 19 days (Strom, Lib. I.C., XXI, p. 406).

Josephus in Ant., XVIII, 6, 10, 22 years 5 months and 3 days, but in Bell II, 95, 22 years 6 months and 3 days.

In the above it is obvious that the first year of Tiberius cannot be reckoned from January 1st. Philo, being a Jew, may have reckoned it as from the 1st Nisan, but the others evidently take it from the date of accession, though Clement is wrong in his years, and we see that the custom was general not only in Rome but in the provinces.

If we accepted, with Philo, March as the beginning of the regnal years, it would not affect the point we have in view, which is to ascertain the year of the winter and early spring before the Baptism; but to be exact we must on the above evidence make the fifteenth year of Tiberius run from August 19th, A.D. 28—August 19th, A.D. 29, and omitting consideration of coins 1 and 2, the existence of which has been denied, we now are in a position to define what is meant by the dating on coin No. 3.

Thus the Ministry of John beginning in the autumn or winter must be placed at the end of A.D. 28 or the beginning of 29, and the First Passover of Our Lord in April, A.D. 29.

§ 2.—THE PUBLIC LIFE OF CHRIST.

With the Passover of A.D. 29 the Public Life of Our Lord may be said to have begun, though the real Ministry did not commence till John the Baptist was imprisoned. We learn that after this Passover He taught in the synagogues of Galilee and came to Capernaum and taught *on the Sabbath days* (Matt. iv, 23; Luke iv, 31). It was after this again that the disciples were reproved by the Pharisees for plucking ears of corn on the "Second Sabbath after the first" (*δευτεροπρωτον σαββατον*) (Luke vi, 1). The meaning of this expression is obscure, and has been taken to be either the first Sabbath after the sheaf offering in Passover week, or the first Sabbath of the second Jewish month, Iyar. In any case it is impossible, in view of the extended tour throughout Galilee and the *weekly* teaching in the Synagogues at Capernaum, that the incident can have occurred in the year A.D. 29, and must be assigned to the year A.D. 30. There is a further reason for this, too, in that it occurred after the imprisonment of John, and this will be shown later to have taken place in the autumn of A.D. 29. After this again comes the feeding of the five thousand (Luke ix, 10-17), which St. John (vi, 4) tells us was just before a Passover. Since the plucking of the

ears of corn was *after* a Passover, the Passover of A.D. 30, it is clear that this is the Passover of A.D. 31.

Between this and the Crucifixion we are told that Our Lord was present in Jerusalem for a Feast of Tabernacles and a Feast of Dedication (John vii, 2 ; x, 22), and, further, that Pilate had murdered certain Galileans at their sacrifices. The only feasts for which the Galileans went up to Jerusalem were Passover, Dedication, Tabernacles, and Pentecost. Now if we allow only one year from the feeding of the five thousand to the Crucifixion we are faced with a difficulty, for Our Lord was not at Jerusalem when the Galileans were murdered. Word was brought to him regarding it. It cannot, therefore, have taken place at the Feast of Tabernacles in October, A.D. 31, or Dedication in December of the same year, for Our Lord was at Jerusalem for both these feasts. And it appears impossible that it should have occurred at Pentecost, A.D. 31, since between the feeding of the five thousand just before the Passover and Pentecost (say 60 days) was an interval of eight days up to the Transfiguration, the return to Capernaum, a journey to the borders of Tyre and Sidon, an exercise of the Ministry in Decapolis, a journey to the villages of Cæsarea Philippi, a return to Capernaum, and the despatch and return of the seventy disciples on their mission, a mission which by itself must have occupied more than the whole time between Passover and Pentecost. We are therefore compelled to consider that all these events cannot be compressed into the year A.D. 31-32, and that the Crucifixion cannot have been before A.D. 33. This would give room for a feast to which the murder of the Galileans could be allotted.

And this year is supported from astronomical considerations, for it is certain that Our Lord was on the Cross on a Friday, 14th Nisan, and this point has been definitely set at rest by Dr. J. K. Fotheringham, Reader in Ancient Chronology at Oxford. Until recently there has been some doubt as to the precise way on which the Jews reckoned the 1st day of Nisan. This, the first day of the New Year, was not settled until the new moon had been observed at 6 p.m. in the evening. If the expected new moon was not then visible the first day was put off for 24 hours. The result was an element of uncertainty, but by using a series of 76 observations made by Schmidt in Athens, and finding the azimuth as well as the altitude of the moon when first seen, Dr. Fotheringham has found a curve which divides those positions of the moon which would result in its

being seen from those in which it would not be seen, and the following table, which gives his conclusions, definitely sets the matter at rest. For details the reader is referred to the *Journal of Theological Studies* for 1910.

<i>Year.</i>			<i>Nisan 14th.</i>
29	..	..	Friday-Saturday, March 18th-19th.
29	..	..	Sunday-Monday, April 17th-18th.
30	..	..	Thursday-Friday, April 6th-7th.
31	..	..	Monday-Tuesday, March 26th-27th.
32	..	..	Sunday-Monday, April 13th-14th.
33	..	..	Thursday-Friday, April 2nd-3rd.
34	..	..	Tuesday-Wednesday, March 23rd-24th.

<i>Year.</i>			<i>Nisan 15th.</i>
29	.	..	Saturday-Sunday, March 19th-20th.
29	..	..	Monday-Tuesday, April 18th-19th.
30	..	..	Friday-Saturday, April 7th-8th.
31	..	..	Tuesday-Wednesday, March 27th-28th.
32	..	..	Monday-Tuesday, April 14th-15th.
33	..	..	Friday-Saturday, April 3rd-4th.
34	..	..	Wednesday-Thursday, March 24th-25th.

(The above are Julian dates. For Gregorian, deduct two from each.)

From this table we find that the only years in which the 14th Nisan after midnight fell on a Friday are A.D. 30 and 33, while for those who consider that the Crucifixion was on the 15th Nisan, not one of these years is eligible. And as from what has been said above the year A.D. 30 is ruled out, we are left with the year A.D. 33.

§ 3.—THE MINISTRY.

Although the public life of Our Lord began with the Passover of A.D. 29, it was not then that He began His real work. John the Baptist was still continuing his ministry, and it is not until he was cast into prison that we hear that Christ "began to preach" (Matt. iv, 12-17; Mark i, 14, 15; Luke iv, 16-21). It was then that we hear that "the time is fulfilled" and "from that time He began to preach." And the time of this can be dated as follows: Herod Antipas about this time had made a

voyage to Rome, and while waiting for a ship, lodged with his brother Philip (not the tetrarch). Here he fell in love with Herodias, Philip's wife, and arranged with her that she should come to him on his return from Rome. This was done, and called for a stern rebuke from John the Baptist, because it was contrary to Jewish law that he should marry his brother's wife, as she had had a daughter, Salome, by Philip. For this reason we may assign the journey to Rome to the year A.D. 29, in which John was imprisoned, more especially as Livia, the wife of Augustus, died early in this year, and Antipas would be likely to go to further his interests in a share of her property in Judæa.

But as news of her death would not reach Antipas till approximately April, and the journey to or from Rome is generally calculated at two months, we cannot put his return earlier than the late summer or autumn, and this is as near as we can get it until we examine the date of the Nativity; but, as it is, it is a further argument in favour of placing the incident of the plucking of the ears of corn by the disciples after the Passover of A.D. 30 rather than A.D. 29.

§ 4.—THE NATIVITY.

In Luke iii, 23, we are told that at the time of His Baptism Our Lord "began to be about 30 years of age," a phrase which has been altered in the Revised Version to "when He began to teach was about thirty years of age." The correction is unfortunate, for there is no hint in the text of any reference to teaching, nor is there any evidence that He taught before the end of the Ministry of John the Baptist, which, as shown above, was in the autumn six months later.

In reality the meaning of the phrase is simple and is intended to imply that the age of 29½ had been reached and that Our Lord was going on towards his thirtieth year. In view, therefore, of the close connection between all His actions and the Law, in view of the way in which He carried out the prophecies, it is practically certain that the day when He could say "the time is fulfilled: this day is the scripture fulfilled in your ears," the day when He "began to preach," was His thirtieth birthday, and for this reason. Thirty years was the priestly age. Before it He could not enter on priestly duties. At thirty He was bound to enrol Himself for His work in the Temple. If He did not do so, if there was any delay, His observance of the Law would

fail. And if this reasoning is right, the Nativity must be placed in the autumn of 2 B.C.

We can, however, get a closer approximation than this. Josephus tells us (Bell., VI, 4, 5) that the Temple was burned on the 10th Ab (5th Aug., Jul.), A.D. 70. According to the Rabbins (Mishna, III, 298, 3) it was on the 9th Ab, and was the day Jehoiarib, the first of the 24 courses of priests, entered on his duties. These duties were for a week at a time (2 Chron., xxiii, 8) and went from Sabbath to Sabbath.

Now Zacharias (Luke i, 5) was a priest of the eighth course, and, as there is no record of any break between 3 B.C. and A.D. 70, we can, by working back, calculate that his course ended on July 13th, 3 B.C. The Annunciation of the Virgin Mary was in Elizabeth's sixth month, say, between December 9th, 3 B.C., and January 8th, 2 B.C., and allowing 280 days, this would bring the Nativity to the month from September 15th to October 15th, 2 B.C.

We have thus a period of some thirty days in which to locate the Nativity, but even yet we have a further clue. Our Lord's exposition of Isa. lxi, 1, related in Luke iv, 16-21, was on a Sabbath. The Day of Atonement in A.D. 29 was on October 7th-8th (Julian) and also was a Sabbath. In the ordinary way the chances against the Day of Atonement coinciding with the beginning of the Ministry would be one to five, since there are five Sabbaths between September 15th and October 15th, but if we realize that the great work of the Saviour was mediation and atonement, we must find it difficult, if up to this point the reasoning has been sound, to discard the Day of Atonement as the date both of the Nativity and the commencement of the Ministry. [In 2 B.C. the Day of Atonement was October 7th-8th (Julian).] So long, therefore, as it is remembered that this exact dating rests on symbolical grounds in its final stage, we shall accept the date, October 7th-8th (Julian) as the day of the Nativity in 2 B.C., and the beginning of the Ministry as October 7th-8th, A.D. 29, the Baptism being before the Passover of this latter year and the Crucifixion on April 3rd, A.D. 33 (Julian).

§ 5.—THE FORTY-SIX YEARS OF THE BUILDING OF THE TEMPLE.

At the time of the first Passover in A.D. 29 the Jews brought it against Our Lord that the Temple had been 46 years building

(John ii, 20). Had the figure been 45 or 50 we might have considered it to be a round number, but it appears to have been a close estimate, especially as Herod commenced it about the time of a Passover. For the *ναός*, or inner temple, was finished on the anniversary of Herod's accession in October, and it had taken a year and six months to build. It was the first part to be built, and therefore we may accept April as the time of year when work was commenced.

Now Augustus visited Syria in 20 B.C. (Dion., LIV, 7), and Josephus supports this, saying (Bell., I, 20, 4) that it was in the tenth year after his former visit in 30 B.C. Herod stays with him in Syria up to the end of his visit, escorting him to the coast when he left. This would be in the autumn of 20 B.C. After Herod's return he builds a temple in Paneas (Josephus, Ant., XV, 10, 3), and then to appease the Jews for this he remits a third of their taxes, after which he gives out his intention of rebuilding the Temple at Jerusalem.

The preparations must have been considerable. Solomon did not begin to build till $2\frac{1}{2}$ years after his accession, though part of the materials had been collected by David his father, and we are told that 1,000 wagons and 10,000 workmen had to be provided by Herod, besides the training of 1,000 priests in carpentry and masons' work. All this would take considerable time in addition to the preliminary work of selecting an architect, getting out plans, etc., and it is very doubtful if it could have been done between the autumn of 20 B.C. and the Passover of 19 B.C. But it appears quite impossible when we read that the Jews were extremely loth to allow it, being afraid that the Temple would be pulled down and not rebuilt. And that it was only after Herod had agreed not to pull it down till all preparations were complete (Josephus, Ant., XV, 11, 2) that they gave their consent. So that the demolition of the existing structure could not be carried out nor the foundations prepared while the other preparations were being made, but had to wait until they were ready.

As therefore it appears out of the question that all this could have been done in less than six months, we must discard the Passover of 19 B.C. and take that of 18 B.C. as the time when the building was begun. And 46 years from this latter date brings us to the Passover of A.D. 29, which we have found to have been the first Passover of Our Lord's public life.

§ 6.—THE ECLIPSE AND EARTHQUAKE AT THE CRUCIFIXION.

A chronological note is supplied by Eusebius (Chron. ad Olymp., 203, 1), who quotes Phlegon of Tralles, the author of the Olympiads, to the effect that in the fourth year of the 202nd Olympiad there was an eclipse of the sun at mid-day and an earthquake in Bithynia. The 4th of the 202nd Olympiad began about the Summer solstice of A.D. 32, and would cover the Pass-over of A.D. 33, thus supporting the datings found above from the Gospel narratives.

It has been objected that there was no eclipse of the sun recorded in that year, but it is forgotten that at the time of the Crucifixion the moon was full. Any eclipse, therefore, must have been by an outside body not belonging to the solar system.

A further objection is made in the *Encyclopædia Britannica*, where the writer summarily dismisses Phlegon's testimony by saying that he probably obtained it from Christian sources. This, however, does not appear an argument for putting it on one side, and in any case, had it been obtained from Christian sources, the earthquake would have been located in Judæa rather than in Bithynia.

§ 7.—JOSEPHUS.

We have now taken the evidence of the Gospels. It appears to be consistent and harmonious throughout, but our difficulties commence with Josephus. This writer, a Jew of noble family, was born in A.D. 37 or 38, but he does not appear to have written his histories till after A.D. 70. A conscientious and trustworthy historian, yet living in an age when materials for history were not over-plentiful. He was given certain records of the Jews after the destruction of Jerusalem, which no doubt assisted him, but his writings are not entirely without mistakes. And we must remember that we cannot lean too much on his chronology. Much of his datings of the periods from the Exodus to the time of Herod are wrong, and as we know well, the Jews were a people who cared little for dates. So that, while his history is of the greatest value as giving details of a time of which practically no other description has come down to us, yet as a witness he cannot be compared to Luke, the latter having access to eye-witnesses, the former having to rest on what records he could collect of a period some forty years before he was born.

§ 8.—THE LENGTH OF HEROD'S REIGN.

Josephus tells us (*Ant.*, XVII, 8, 1) that Herod reigned 37 years from his appointment as king by the Romans, in 40 B.C., and 34 years from the capture of Jerusalem and death of Antigonus, in October, 37 B.C. There is no question about the starting points of these two periods, as they are generally accepted on good and sufficient evidence. And it is certain also that Josephus reckoned the reign not from October, but, in the Jewish fashion, from the previous 1st Nisan (about April). As such the 34 years would end on 1st Nisan, 3 B.C., but his death might actually have occurred any time after 1st Nisan, 4 B.C.

It is here where the great difficulty has arisen. For if Herod did die before the 1st Nisan, 3 B.C., the Gospel evidence must be at fault. Josephus is considered to have the support of at least three items of evidence: (1) The presence of P. Quintilius Varus as Governor of Syria at the time of his death; (2) The dates when Herod's sons, Antipas and Archelaus, began their rule; (3) The eclipse of March 13th, 4 B.C., said to be shortly before Herod's death.

§ 9.—HEROD'S AGE AT HIS DEATH.

Herod is described at the time of his death as "about seventy" (*Bell.*, I, 33), or "almost seventy" (*Ant.*, XVII, 6, 1), and if he died in 3 B.C. he would have been born about 73 B.C. It is rather startling, therefore, to find that Antipater in 47 B.C. made his sons Herod and Phasælus captains respectively of Galilee and of Judæa, Herod then being 15 years of age (*Ant.*, XIV, 9, 2). This is generally considered to be a mistake, but this it cannot be. The *Wars* was an earlier work, and in this (*Bell.*, I, 10, 4) Herod is said to have been "very young." In the *Antiquities* the statement, instead of being corrected, is emphasized and his actual age given. Moreover, if he had been 25 as these critics wish to make it, so as to harmonize the chronology, he could not have been described as "very young." We find Caius Cæsar given command of the East in 2 B.C. at 18 years of age without any such suggestion. However we look at it, it affects seriously the evidence of Josephus, for if Herod was 15 years old in 47 B.C., he would not be "about seventy" till well into the first few years of the Christian

era, and this would shake the evidence that he died in 4 B.C. very considerably.

§ 10.—THE ECLIPSE.

There is no evidence that Herod died anywhere near a Passover. Certainly Josephus does not say so. Yet it has been widely held from a misreading of Ant., XVII, 6, 4. This paragraph tells us that Herod deprived Matthias the high priest of his office and burnt certain of the Jews who had taken part in a riot, and that on that very night was an eclipse of the moon. In the middle of this relation Josephus somewhat clumsily introduces a piece of gossip about "this Matthias," who, he says, dreamed of having a conversation with his wife the night before a fast of the Jews, and for that reason could not officiate. The two accounts were connected, and as there was an eclipse on March 13th, 4 B.C., it was claimed that this was the eclipse referred to, and that the fast was the fast of the 13th Adar, the day before the two-day feast of Purim. On this it may be observed that in 4 B.C. there was an intercalary month, Ve-Adar, which covered March 13th, and the Jews never had any fasts in Ve-Adar, and, again, had there been no intercalary month, the 13th Adar is not one of the fasts recognized by the Jews in the Megillath Ta'anith or Scroll of Fasting.

And if the paragraph be read, it will be seen that the anecdote about the dream and the fast has no connection with the burning of the Jews or the eclipse, for it opens with the words: "Now it happened that, *during the time of the high priesthood of this Matthias*, there was another person made high priest for a single day, that very day which the Jews observed as a fast."

It was not at the time of the eclipse, therefore. It may have been a year or several years before, and had nothing to do with it, and there is nothing, therefore, to connect this eclipse with the eclipse of 4 B.C. Yet the eclipses of this time have a bearing on the date of Herod's death. For some time before the eclipse Herod had sent an urgent embassy to Rome for Augustus' views on the misdeeds of his son Antipater. Being urgent, we cannot allow more than five months for the going and returning and time spent in Rome, and as the answer was received within a few days of Herod's death, the eclipse must be reckoned as occurring not more than five months before. The eclipses of

the moon between 4 B.C. and A.D. 4, which occurred *at night*, were as follows:—

March 13th ..	4 B.C.	May 4th ..	A.D. 3.
January 9th ..	1 B.C.	October 28th ..	A.D. 3.
November 9th ..	A.D. 2.	October 17th ..	A.D. 4.

Now we are given the month and day of the month of Herod's death in the Megillath Ta'anith, which is a list of fasts compiled in the first century A.D. The Jews had suffered so much at Herod's hands that they kept the day of his death as a fast, and this day was the 7th Kislev, which answers to November. There are few more persistent traditions than anniversaries, as witness our May 1st and April 1st, and we may fully accept this as good evidence. As such the 1st, 2nd and 4th of the above eclipses would be ruled out, and we are left with the three autumn eclipses of A.D. 2, 3 and 4, which all occurred on the 14-15th Bul, which is the month preceding Kislev, and this evidence points to one of these three years as being the year of Herod's death.

Note.—Some writers say that the Fast Day for Herod's death given in the Scroll of Fasting is the 2nd Sebat. This, however, appears to be incorrect. A translation of the Scroll into French will be found in an article by M. Schwab in *Actes du Onzième Congrès International des Orientalistes*, Paris, 1897, from which it will be seen that both the 7th Kislev and the 2nd Sebat are entered in the Scroll as days of fasting without comment. But in the Commentary attached the 7th Kislev is assigned to Herod and the 2nd Sebat to Alexander Janneus. M. Schwab says that certain critics transposed these two dates in order to connect the eclipse of Josephus with that of January 9th, 1 B.C.!

§ 11.—THE DATE WHEN THE SONS OF HEROD BEGAN THEIR RULE.

Coins of Antipas, tetrarch of Galilee, have been found dated, some in his 43rd year and others in his 44th year (Eckhel, III, 486). He was banished in A.D. 40 in the 4th year of Agrippa (*see* Lewin, *Fasti Sacri*, paras. 1561, 1592), and after April 1st, as Agrippa's accession was about that date. This means that the rule of Antipas was reckoned from 1st Nisan, 4 B.C. Herod Philip, tetrarch of Trachonitis, ruled 37 years and died in the twentieth

year of Tiberius, A.D. 33-34 (Ant., XVIII, 4, 6). As the years of Tiberius were reckoned from August, this means that Philip's rule was from Nisan, 4 B.C., to Nisan, A.D. 34.

Archelaus was deposed in his 10th year in A.D. 6 (Ant., XVII, 13, 2), which would again bring the official reckoning of his obtaining office to Nisan, 4 B.C. In the following paragraph, Josephus tells the story of a dream of this Archelaus, which was interpreted to mean that he would see ten harvests as ethnarch, and as in Judæa the harvest follows the opening of the Jewish year on 1st Nisan, this would be the case if he actually began to rule between the 1st Nisan and the harvest. Although this was a dream only, yet such dreams do not pass into history unless they come true, and we may take it that Archelaus, and probably, therefore, Antipas and Philip, did obtain their territories close to the 1st Nisan, 4 B.C.

At first sight all this appears to support Josephus in saying that Herod died in this year, but this is doubtful. On Herod's death his sons journeyed to Rome to have their father's will approved by Augustus, and we are told that part of this judgment ran: "Idumea and Judæa and the country of Samaria paid tribute to Archelaus, but had now a fourth part of that tribute taken off by order of Cæsar" (Ant., XVII, 11, 4).

It follows from this that Archelaus had been receiving tribute before his journey to Rome, and this journey, therefore, was not for the purpose of obtaining his territory, but of getting confirmation of it. It seems clear that he and probably the other two had been governing their tetrarchies during Herod's lifetime and probably drawing the revenues, less such amount as was necessary for Herod's wants. And there would be nothing strange in this. Herod himself and his brother had been tetrarchs under their father Antipater, and certainly Herod was too ill towards the end of his life to see to all the details of government.

§ 12.—THE GOVERNORS OF SYRIA.

We have coins of Antioch struck by P. Quinctilius Varus of the years 7-6, 6-5, and 5-4 B.C. After that time we know nothing till we find, in A.D. 6, P. Sulpicius Quirinus (the Cyrenius of St. Luke) superseding Saturninus as governor.

There is some evidence, apart from the account of the "Taxing" in Luke ii, 1, 2, that Cyrenius had had a previous term of office.

The argument is too lengthy to be produced here, but is discussed in Lewin's *Fasti Sacri*, para. 955. In any case we cannot gainsay St. Luke, for we know of no other governor in 2 B.C., and until we do his evidence stands.

Josephus, however, states that Varus was in office till after Herod's death, and this would harmonize with 4 B.C., but there is no particular reason why Varus should not have been governor at the time of Herod's death, even if it occurred in A.D. 4, as we have found might easily have been the case. We know of no other governor at that time, and it is quite possible that Augustus, as in the case of Quirinus, gave Varus a second term in order that a turbulent people like the Jews should have over them a man who had had previous experience of their ways. Moreover, Varus is said to have gone to Syria a pauper and left it an extremely wealthy man, and he would have more prospect of doing this in six years than in his first three alone.

At least we can say this, that the presence of Varus in Syria at the time of Herod's death is not necessarily supporting evidence that that death occurred in 4 B.C.

§ 13.—SUMMARY.

We can now take a general view of the evidence. That Herod reigned 34 years is in direct conflict with his appointment as Captain of Galilee in 47 B.C., at 15 years of age, but this latter would support the Gospel evidence that Herod was alive in the autumn of 2 B.C.

Of the three items which are held to support Herod's death as occurring in 4 B.C., there is nothing to connect the eclipse before Herod's death with that of March 13th, 4 B.C. Indeed, Herod's death date of the 7th Kislev would seem to put it out of court.

The three sons of Herod did begin their rule on or about 1st Nisan, 4 B.C., but this was in the lifetime of Herod, and the two cannot be connected in any way.

The presence of Varus, again, is not necessarily evidence that Herod died in 4 B.C. as shown above.

It follows, therefore, that that statement of Herod's 34 years is left in the air. It is contradicted by Josephus himself in regard to Herod's appointment as Captain of Galilee, and can only be regarded with extreme suspicion.

On the other hand, we have seen that the Gospel indications

are that Our Lord's public life began at the Passover of A.D. 29, and that no statement in Josephus confutes this with the single exception of the unsupported 34 years of Herod's reign.

That Josephus should have made the mistake may have been quite natural. As Herod's sons did begin to rule in April, 4 B.C., we may easily understand that, in the absence of fuller details, it was inferred that Herod was then dead. In any case, however, it is satisfactory to be able to uphold the trustworthiness of the Gospel writers.

I would like to add that it has been in no spirit of pedantry that this subject has been selected. Many people at the present time consider that chronology is of no value and say that a few years more or less are of no consequence. But a very little examination into Bible periods in general, and the details of Our Lord's life in particular, are enough to show that the same care exhibited by Him in following out the ancient prophecies was exercised in regard to chronological matters. It is not too much to say that His life on earth was one of the greatest pivots of religious history, and the further our study of chronology is extended the more do we find that it branches out and its ramifications extend into almost every field of Biblical study, and connect up with the history of almost every one of the Eastern nations and of their earliest mythical beliefs.

And it is easily shown that its study is necessary, for, until we have settled the main datings, the Seventy Weeks of Daniel hang in the balance, and we have to abandon his standing as a prophet to those who consider that he never existed, his writings being the work of a pseudonymous writer of three centuries later. And if Daniel is depreciated, the authority of the other prophets, and of prophecy in general, is seriously weakened.

I have no wish, however, to lay undue stress on any particular dates. My wish has been rather to set out in available form evidence which is in the highest degree material, but hardly ever made use of. And it cannot be too strongly insisted on that no other evidence carries as much weight as that of the coins which have been detailed above. One or two might be spurious, but there are too many of them here, and too many of each kind. They are strictly official, and are coins which were in common use in the Holy Land. And, further, they cannot have been tampered with in the same way as the writings of historians on whom we are accustomed to rely.

DISCUSSION.

The CHAIRMAN (Sir Ambrose Fleming) said : I am sure I shall be expressing the feeling of all present in saying that we are greatly indebted to Colonel Shortt for his learned and interesting paper. As a rule dates and chronology are generally considered to be very dry things by most persons, and especially by young readers. In connection with sacred history, however, they are very important, as they serve to connect Biblical and secular events and give us means of confirming the accuracy of the Bible histories.

The difficulty which presents itself to the ordinary reader is that of deciding between the confident statements of different authors or chronologists. It is, as Colonel Shortt remarks, strange that, in connection with such a supremely important event as the redemption of the world, we are still in doubt as to the exact dates of the Nativity, the Baptism, and the Crucifixion of our Lord. For instance, we call the present year A.D. 1931, and most persons, if asked why or from whence the 1931 is reckoned, would probably reply : " From the birth of Christ." They are, therefore, puzzled to understand why the date of the Nativity should be given as 2, or 4, or even 8 B.C.

Very few people understand that our present mode of reckoning time dates from an assumed era or date of the birth of Christ, and was introduced into Europe about the sixth century by Dionysius, a Roman abbot ; but more modern knowledge has shown us that the Nativity certainly took place before the date assigned to it by Dionysius. Then, again, the common custom of taking the 25th of December to be the day of the Nativity was not introduced until after the accession of the Roman Emperor Constantine, about the beginning of the fourth century.

It is curious to note that even at the present day so many preachers, in addresses delivered at Christmas, or about December 25th, speak as if there could be no doubt that the birth of Christ took place then. It is as certain as anything can well be that the Nativity took place in the autumn, and not in the winter. St. Luke tells us that the Roman Emperor Augustus, at a certain time, decreed that a " taxing " should be universally made. This was, in effect, a " census " for the purpose of ascertaining the man-power

and resources of the Roman Empire. The Romans were very stern governors, but they were not fools, and they would not have ordered all persons to return to their native towns or villages in the dead of winter, when women and children would have to endure great hardship in travel. Winter in Palestine is often very cold, and shepherds do not keep their sheep in the open or lie out themselves then.

On the other hand, in the autumn, when the weather is warm, and at a time when the wheat harvest has been got in, and the farm animals—asses, camels, mules, etc.—are mostly at liberty, the people could easily move about and sleep out of doors, and the village people would think it rather good fun to have an excuse for such an excursion. The Israelitish Feast of Tabernacles was held at that time, when the people lived and slept in booths out of doors for a whole week. Hence it is more than probable, in fact, nearly certain, that this "census" took place at about that time and that this was the occasion which brought Joseph and Mary up to Bethlehem as described by St. Luke, and there the birth of our Lord took place, when "the Word became flesh and tabernacled among us." Whether that birth actually took place on the great Day of Atonement, as Colonel Shortt suggests, is a matter on which I can offer no opinion, but I have always felt that the date must come somewhere in the autumn, and certainly not on December 25th, as is our custom now to celebrate it. Grattan Guinness, in his book, *The Approaching End of the Age* (p. 527), mentions that Archbishop Ussher, the great Biblical chronologist, placed the Nativity (as Colonel Shortt has done) on the great Day of Atonement.

Next as to the year of the Nativity. Dates even as early as 8 B.C. have been given. The astronomer Kepler fixed the Nativity as early as 6 B.C., from the assumption that the star which guided the Magi was a conjunction of the planets Jupiter, Saturn, and Mars occurring about this date. But such a celestial planetary phenomenon could not be the star mentioned by St. Matthew, as this star is said to have "stood over where the young child was" (Matt. ii, 9). It was much more likely to be a supernatural phenomenon.

The whole question, then, as to the date of the Nativity, really turns upon the exact date of the "fifteenth year of Tiberius,"

and the dates on the coins mentioned by Colonel Shortt seem quite decisive on that point. The date of the battle of Actium was September 2nd or 3rd, 31 B.C., when Augustus Cæsar defeated his rival, Antony, and made himself sole Emperor of Rome. Tiberius was the adopted son of Augustus, and after many successes as a soldier he became, at about the beginning of A.D. 11, practically joint Emperor with Augustus, and sole Emperor on the death of Augustus on August 19th, A.D. 14.

There is no doubt about these dates, and the only question at issue always has been whether the fifteenth year of Tiberius was to be reckoned from the date of his practical co-regency with Augustus, in A.D. 11, or whether it should be reckoned from his accession to the throne as sole Emperor in A.D. 14. The coins mentioned by Colonel Shortt, especially the third, seem decisive. The Greek letters denoted also numerals. Thus the A (or Alpha) on the third coin is I, and means the first year of Tiberius; the EM on that coin are *epsilon* and *mu* of the Greek alphabet, which mean respectively 5 and 40. Hence the coin gives us the chronological equation—1st year of Tiberius is the same as the 45th of the battle of Actium, and $45 - 31 = 14$. Accordingly, the first year of Tiberius began in A.D. 14, and his fifteenth year would then begin on August 19th, A.D. 28, which was, therefore, the year when John the Baptist began his reformation, and near to the date when Christ was baptized, and when he was said to be *about* 30 years old.

We are not given specifically in the Gospels the duration of Christ's earthly ministry, and hence some difficulty exists in fixing the exact date of the Crucifixion. Grattan Guinness fixes this as occurring on March 18th, A.D. 29. Sir Robert Anderson gives it as April 11th, A.D. 32, and Anderson determines it on the basis of the Daniel prophecy of the seventy weeks. He arrives at the figure by showing that the edict of Artaxerxes, to restore and rebuild Jerusalem, was given on March 14th, 445 B.C. and then, reckoning forward 69 weeks of years (each of 360 days), he finds that Christ rode into Jerusalem on April 6th, A.D. 32, and, therefore, the Crucifixion must have taken place on April 11th, A.D. 32. This proof, however, is somewhat artificial. The data given by Dr. Fotheringham as to the days of the 14th of Nisan seem to prove beyond doubt that the Crucifixion must be assigned to April 3rd, A.D. 33.

It is an astonishing thing to notice how little agreement exists even between eminent chronologists as to the actual dates of cardinal Biblical events. Thus there are differences of even several hundred years between dates given for the Exodus and great differences as to the date of beginning Solomon's Temple. In his *Romance of Biblical Chronology*, Martin Anstey gives 4 B.C. as the year of the Nativity, and A.D. 30 as the year of the Crucifixion. One thing, however, remains quite clear from all that Colonel Shortt has told us, and that is that the "fifteenth year of Tiberius" began on August 19th, A.D. 28, and that fixes the beginning of the Ministry of Christ.

The Greek word in Luke ii, 1, which is translated "taxed" in the A.V., is in Greek the same word which occurs in Heb. xii, 23, and is there translated "written" or "enrolled." Hence the "taxing" decreed by Cæsar Augustus was, in effect, a census.

In conclusion, I beg you to support by your applause the hearty vote of thanks to Colonel Shortt which I have the pleasure of proposing for the very able and learned paper which he has given us.

Dr. J. K. FOTHERINGHAM, of Oxford, expressed general agreement with the methods and conclusions of the paper. He thought that St. Luke's phrase, "about thirty years," allowed a margin of several years on either side, and could not be used to establish a fixed chronology. He drew attention to the coins struck by the Roman procurators of Judæa, one of which, issued in the first year of Tiberius, bears the name of the Empress Julia, and cannot, therefore, be older than the death of Augustus, since Livia received the name Julia by Augustus' will. Another coin dated in the sixteenth year of Tiberius also bears the name Julia, which proves that the sixteenth year as reckoned in Judæa was already current when she died, apparently in the earlier part of A.D. 29. This evidence would seem to suggest a year reckoned from Nisan, in which case the fifteenth year would begin in the Nisan of A.D. 28.

Dr. NORMAN S. DENHAM said: Regarding the day of Herod's death, one has always understood that there was no reason to doubt the acceptability of 2nd Shebat. We are given the impression on p. 51 that M. Schwab favoured 7th Kislev; but the fact is that both were Festivals not Fasts, and Schwab himself thought that the commentator was wrong in taking on himself to assign the death

of Herod to 7th Kislev; he considered it to be more probable that the rejoicing for that event was upon 2nd Shebat, the former date being historically unacceptable.*

If the eclipse of March 13th, 4 B.C., fell before the death of Herod, which we know occurred at least some months before a Passover, the numerous events related by Josephus as transpiring between Herod's death and the Passover, make certain that Herod could not have died in 4 B.C., but in 3 B.C. This would agree exactly with the account of Josephus as to Herod's *de facto* reign of 34 years, the last of which includes the 2nd Shebat, falling in January, 3 B.C. None of the records of Matthew, Josephus or the Megillath Ta'anith need be challenged, for they provide perfect harmony. We remember that Herod desired to slay, not the "babe" (*brephos*) of Luke ii, 12, but the "young child" (*paidion*) of Matt. ii, 16, of two years old or under.

With regard to the fifteenth year of Tiberius, our lecturer's conclusion is negatived, I believe, by the evidence adduced by Lieut.-Colonel G. Mackinlay, who shows that the ministry opened in a Sabbatic year.† This year, A.D. 26, was the 31st Jubilee year from the entry into Canaan, and was prophesied by Isaiah (ch. lxi, 2). The true sequence of Sabbatic years is established by the records in 1 Macc. vi, ix, 43, and Josephus, Ant., XIV, 16, 2, and XV, 1, 2. The series was correctly noted by Sir Isaac Newton, Schürer, Dr. Grattan Guinness, and others. If we depart from the opinion held by Ussher, Lardner, Hales, Gresswell, and others, that Luke dated from Tiberius' co-partnership with Augustus, we are in immediate conflict with the sacred historians. Gresswell shows in his *Dissertations* (p. 278), that in A.D. 12-13, Tiberius was already *Princeps*, and exercising the functions of royalty by disposing of offices of patronage and trust, and entitled in his own right to the name of *Sebastos*. Sir Wm. M. Ramsay goes further. He claims that Luke knew that the reign of Titus was counted from when he was made colleague with his father, Vespasian, and was led to apply the principle in current and official use while he was writing, to the years of Tiberius.‡

* *Elements of the Jewish Calendar* (1901). S. B. Burnaby, p. 266.

† *Recent Discoveries in St. Luke's Writings* (1920).

‡ *Was Christ born in Bethlehem?* (1898), p. 197 *et seq.*

On the testimony of Velleius (*circ.* 19 B.C.—A.D. 31), Augustus himself proposed the granting of authority equal to his own in all the provinces and armies of the empire, before the triumph celebrated in Rome on January 16th, A.D. 12. The Decree of equal power must have been passed before the end of A.D. 11, and Sir Wm. Ramsay shows that whether we take the Roman or Jewish reckoning, the fifteenth year of Tiberius must have been current in A.D. 26. The first Passover of the Ministry mentioned by John (ii, 23), therefore fell in the spring of A.D. 27, and by the Biblical usage regarding ages, our Lord must have been born in the autumn of 5 B.C., probably at the Feast of Tabernacles.

Mr. G. WILSON HEATH said: May I say that I consider the paper to be a very serious and specious challenge! We have had set before us an array of authorities on this subject, most of them by the writer to be ignominiously turned down. At times I felt that we had reached a bed-rock position, but in a few sentences the lecturer was able to dynamite the supposed rock into rubble.

Even the summary at the close of the paper leaves us in doubt. The first paragraph speaks of direct conflict "as to the date of Herod's reign." The second paragraph suggests that we "cannot trust to eclipses" (I agree). The third paragraph points out that confusion exists as to "how many kings did reign in A.D. 4." The fourth paragraph tells us that the presence of Varus is "not necessarily evidence." The fifth paragraph assures us that the 34 years of Herod's reign is "left in the air." And finally, with strong insistence, that the evidence of coins carries great weight, "but some of them may be spurious."

I am anxious for all the light I can get on the Scriptures. The Bible, thank God, will bear reverent inspection. I have, therefore, read over this paper several times, but I have to confess that I am still not convinced that the half-hearted conclusions suggested in it are the correct ones, or that the deductions from the evidence placed before us is sufficient to encourage us to reject that which hitherto we may have accepted.

I think we shall all admit that we must accept the Julian Calendar when considering this period, seeing this calendar was promulgated by Julius Cæsar on January 1st, 46 B.C. (The Gregorian Calendar

was issued in March, 1582, and is out of the period we are considering.) We should also, I suggest, accept the date of the victory of Actium as in the autumn of 31 B.C. Also that the datings and markings of reliable coins is good evidence, and as to this I suppose we shall all be prepared to accept coins Nos. 3 and 4 of the set on p. 40, that is to say, the “*doubly marked*” ones, and these are, of course, the most important ones mentioned. (I rather think that coin No. 6 is wrongly figured, but this is not important.)

In the coin room of the British Museum anyone can, I believe, inspect Augustus coins of the years 27, 28, 29, 30, and Actium victory 31.

Now admitting these important premises, I judge that apart from these altogether, by comparing carefully the dates, *Anno mundi*, *Anno urbis* (Rome) B.C. and A.D. (Julian) we get the following bed-rock results, which are *not* in accord with the paper read to us:—That the mysterious Nativity occurred at the end of September, 4 B.C., the date of the first taxing by Quirinus, which would be *Anno mundi* 4000 or *Anno urbis* 749 (Rome), and the 28th year of Augustus. That Herod died in January, 3 B.C., or *Anno urbis* 750. That the first year of Tiberius as joint Governor with Augustus in the 44th year of his reign was in A.D. 12, or *Anno urbis* 765. That after the death of Augustus, Tiberius reigned alone, A.D. 14, or *Anno urbis* 767, or *Anno mundi* 4018. That the fifteenth year of Tiberius was A.D. 26 (not 29), or *Anno urbis* 779, or *Anno mundi* 4030. That our Lord at that date would have reached the necessary age, under Jewish law, of 30, in order to enter upon His public ministry (Luke iii, 23). That in the eighteenth year of Tiberius, A.D. 29, or *Anno urbis* 782, or *Anno mundi* 4033, our Lord was crucified.

I have been informed that Justin Martyr mentions at least three times that our Lord was born during the first Governorship of Quirinus, and the date of this is authenticated (1 to 3 B.C.), at which date our Lord would be three years old. During this period there should have occurred three ten-yearly taxings or census-takings. One did, we know, occur during the first Governorship of Quirinus, but there is some question as to the exact dates of the other two. They were certainly previous to A.D. 26. Thus the Scripture record and profane history agree that our Lord entered on His ministry when 30 years old, in A.D. 26, and was crucified in

A.D. 29, and that the fifteenth year of Tiberius coincided with the opening of our Lord's ministry, in A.D. 26.

Then as to the 14th and 15th Nisan : May I say that the *itinerary* of our Lord is so clearly traced in the Gospels, and the seventh-day sabbaths, and also the special sabbaths (for, of course, there were two sabbaths in the Passover week) so definitely stated, that we ought easily to be able to fix the date. It is easy to fix on Wednesday-Thursday, the 8th Nisan, as the day our Lord was in the house of Zaccheus, and that He passed through Jericho on His way up to Jerusalem; on Thursday-Friday, the 9th Nisan, He was in Bethany; on Friday-Saturday (Sabbath), the 10th Nisan, He was in the Temple the first day of the inspection of the Passover Lambs; on Saturday-Sunday, 11th Nisan, He was in the Temple; on Sunday-Monday, 12th Nisan, in the Temple; on Monday-Tuesday, 13th Nisan, for the fourth or last time, in the Temple, the inspection was complete. On Tuesday-Wednesday, the 14th Nisan, the Chagigah supper, betrayal, judgment, crucifixion, and tomb. (This was called the "preparation" day, when the inspected lambs were slain.) Then the 15th, 16th, and 17th, the three days and three nights in the grave (Matt. xii, 40). Saturday-Sunday, the 18th Nisan, "the 1st of the weeks," the day on which the Resurrection took place.

The Gospel story is absolutely complete, the itinerary, the Passover week, the Resurrection on "the 1st of the weeks," all exactly agree, and from the 8th to the 18th the days are definitely marked off in the Gospels, proving that the 14th Nisan fell on Tuesday-Wednesday of that year.

Finally, as to the 70 weeks of years of Daniel ix, these we all, I hope, agree, date from the commandment given by Artaxerxes in his 20th year to rebuild Jerusalem, and this was in Anno mundi 3547 or 454 B.C. The 69 of the 70 weeks, or 483 years, to *Messiah the Prince* would bring us exactly to Anno mundi 4030 (allowing for the well-known 3 to 4 years error in the B.C. dates) or A.D. 26, the date of the opening of the Messianic Ministry, and, therefore, the *cutting-off in the midst of the week* would exactly synchronize with our Lord's 33rd year in A.D. 29, or Anno mundi 4033 and Anno urbis 782. And I verily believe also that the dates on unquestionable coins, if properly calculated, would confirm these results. The tragic

scene of Golgotha was enacted in A.D. 29, and this confirms the prophetic words by Daniel in chap. ix and the 70 weeks of years.

MR. SIDNEY COLLETT said : On p. 45, referring to Luke iii, 23, where we are told that Christ was about 30 years of age, Colonel Shortt says that : "Thirty years was the priestly age. Before it He could *not* enter on priestly duties." But surely the Colonel forgets that that referred to the *Levitical* priesthood, and Christ was not of the tribe of Levi, and, therefore, could not be (and, indeed, was not) an *earthly* priest, as is clearly stated in Heb. viii, 4. Moreover, "it is evident that our Lord sprang out of Juda, of which tribe Moses spake nothing concerning priesthood" (Heb. vii, 14).

As I read the paper the author's aim seems to be to confirm the statement in Luke iii, 1, concerning "the fifteenth year of the reign of Tiberius Cæsar," and he has marshalled a great number of coins to support that claim. It is significant, however, that, in this particular case, St. Luke is the one Evangelist who tells us where he got his information from which he gives us in his Gospel, viz., not from any human source whatever ; but *from above*, as is specifically stated in the third and fourth verses of his opening chapter. There he tells us that he had *perfect* understanding of *all* things not "from the very first"—the Greek word used here is nowhere else so translated ; we have it correctly rendered in John viii, 23, where our Lord said : "Ye are from beneath, I am *from above*." So that we have those four definite statements for our guidance : (1) That he had *perfect* understanding ; (2) of *all* things ; (3) *from above* ; (4) so that, in the midst of a number of other human records, those who read *his* account might know the *certainty* of things he wrote !

WRITTEN COMMUNICATIONS.

Lieut.-Colonel L. M. DAVIES, R.A., wrote : Colonel Shortt has done good service in collecting evidence regarding the actual dating of the years of Tiberius, as proved by coins. There seems to be no objective evidence whatever for a dating prior to the death of Augustus. It is significant that Josephus himself, who repeatedly refers to the years of Tiberius, invariably reckons them from the

death of Augustus (cf. *Ant.* XVIII, 2, 2; 4, 6; 6, 5, 10; *Wars* II 9, 1, 5; etc.); and if a Jew like Josephus did this, how much more must a Gentile like Luke have done so, especially when writing to a Roman (Luke i, 3; Acts i, 1).

I would also, in this connection, point out that Josephus himself gives no real support to those who would place Herod's death before the Passover of 4 B.C. Not only does he (Josephus) nowhere definitely state that Herod died before that particular Passover, but a number of his statements seem to indicate the belief that Herod did not die until late in 3 B.C. Thus he mentions so many events as occurring between the famous eclipse and the Passover following Herod's death, as to make it seem impossible that the latter could be the Passover of the same year as the eclipse. Again, Josephus definitely states that Herod reigned 34 years "since he had procured Antigonus to be slain," and 37 "since he had been declared king by the Romans" (*Ant.* XVII, 8, 1. He repeats the same statement in *Wars* I, 33, 8). Now it can be shown by many interlockings of Roman, Armenian, and Jewish records that the former event occurred late in 37 B.C., and the latter late in 40 B.C. This, in each case, takes us to late 3 B.C. as the approximate time of Herod's death.

We also arrive at the same result if we accept Herod's age at the time of his death, for Josephus states that he was "almost seventy" years old, and "about the seventieth year of his age," some months before his death (*Wars* I, 33, 1; *Ant.* XVII, 6, 1). So the statement (*Ant.* XIV, 9, 2) that he was 15 when first made governor of Galilee after Cæsar's visit in 47 B.C., does seem to me to be a corruption. Reconciliation of these passages seems to demand either that we read 25 instead of 15 in one passage or 60 for 70 in two passages, and the former alternative seems to be preferable. In either case this again brings us to the year 3-2 B.C. for the time of Herod's death.

Even, then, if we go by Josephus, we have good reason for placing Herod's death late in 3 B.C., and our Lord's birth somewhat earlier. In that case our Lord might still have been in His 31st year at the beginning of the fifteenth year of Tiberius. Is this not compatible with Luke iii, 23? We may, in any case, remember that, according to C. H. Turner, even had our Lord been 32 years of age at that

time, that "tallies well enough with St. Luke's general estimate" (*Enc. Brit.*, 1910-11, vol. iii, p. 889).

Mr. W. R. ROWLATT-JONES wrote: As symbolism is one of the distinctive features of Holy Writ, our lecturer is fully entitled to use it, and when times (dates) and seasons (anniversaries) coincide we may see their Ordainer at work. It is possible that at the Nativity three events all befell upon the same moment of time. These three festivals would be the opening of the Year of Jubilee, the first day of the Feast of Tabernacles and the great Day of Atonement. All three commenced at sunset (6 p.m.), all three were inaugurated by the sounding of the ram's horn (*see* Numb. x, 9, 10; Ps. lxxxi, 3).

Notice the dovetailing of these events:—At the striking of the Jubilee Year the Ransomer was born; on the great Day of Atonement (the anniversary of Moses coming down from the Mount of Reconciliation), the long-drawn-out agony that only finished at the Cross commenced; just as the Feast of Tabernacles was proclaimed, God Himself tabernacled among men, and this not only in a metaphorical sense but in actual deed, for failing room in the Khan of Bethlehem, Joseph found temporary shelter for Mary under the Great Pergola which ran along the inner wall of its vast outer court for about two hundred yards, "the place where the cattle chew the cud," as the word translated "manger" really means.

Isaac and Jacob knew this khan and its great court as the Tower of Edar, Gen. xxxv, 21; Micah iv, 8 (the Tower of the Flock). Ruth the Moabitess knew it as the parcel of ground that was once Elimelech's. David as a child knew it as a delightful playground, containing the home-well of Bethlehem, and the prophet Jeremiah called it the Palace of Chimham. In the Talmud it is styled the Great Camp of Chimham.

Here from spring till autumn the flocks and herds were sheltered from the intense heat of the sun, and daily at 4 p.m. were driven out to feed on the veldt.

I invite our chronologers to endeavour to discover that Jubilee year, and the problem we are invited to study will then possibly be solved.

LECTURER'S REPLY.

I would like to thank the President for his appreciative remarks, and Dr. Fotheringham for his general acceptance of my paper. Also I am grateful to Mr. Sidney Collett for his criticism in regard to Our Lord's age at the beginning of His Ministry. I think that reading the whole of Hebrews VII rather confirms my view. Melchizedek took tithes of Abraham, not because he was a Levite, but because both conformed to certain rules for those who dedicated their lives to God. Our Lord did the same as regards His age. The point, however, needs further careful consideration.

That the 7th Kislev was a feast and not a fast, as Dr. Denham says, I will not contest. There are obvious difficulties in so considering it, but it is quite unimportant in this connection. Both he and Mr. Wilson Heath have re-stated their views, but they do not attempt to combat the evidence which I have put forward. If this evidence is disproved, well and good ; but until this is done, I think I need not add anything to what I have already said.

741ST ORDINARY GENERAL MEETING

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL,
WESTMINSTER, S.W.1, ON MONDAY, JANUARY 19TH, 1931,
AT 4.30 P.M.

DR. JAMES W. THIRTLE, M.R.A.S., IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed, and signed, and the HON. SECRETARY announced the following elections :— As a Member, the Rev. Charles Leopold Clarke, and as Associates, the Rev. Arthur Body, M.A., and the Rev. W. E. Woodhams Denham, B.D., F.R.G.S.

The CHAIRMAN then explained the absence of the Rev. Dr. W. M. Christie, the author of the paper, in his field of labour, and then read the paper entitled "The Renaissance of Hebrew."

THE RENAISSANCE OF HEBREW.

By REV. W. M. CHRISTIE, D.D., Mount Carmel Bible School,
Haifa, Palestine.

MISTAKEN NOTIONS.

THE common opinion, even amongst educated people, is that during the Captivity in Babylon the Israelites forgot the Hebrew speech, and came back an Aramaic-speaking people, and that in so far as Hebrew continued to exist it was merely a learned language practically confined to religious purposes, like the Latin of the Middle Ages, and along with it to be reckoned one of "the dead languages." There has, however, in every age been a great difference between the dead ecclesiastical languages used in prayer and Hebrew as used by the Jew for a like purpose. We have challenged those who used Latin, Ancient Greek, and Slavonic in church services, and asked

its value, seeing the worshippers did not understand it, and we have invariably got the answer, "It does not matter, God understands it." No Jew ever gave such an answer. He was always able at the least to read his Hebrew and say "It means so and so," in short to translate into current speech.

HEBREW NEVER REALLY DEAD.

And from the time of the Maccabees to the present day we have an unbroken series of writings in the Hebrew tongue. It is quite true that Aramaic was the common speech of the people, but Hebrew literally lived alongside of it. There can be little doubt that the Hebrew of the Mishnah, Tosephta, the Midrashim, and the Talmuds was the language of the schools in both Palestine and Babylon; and though at times mechanical, awkward, and mixed, there is, especially in the Haggadah, a facility and liveliness that could only be attained if the language were living to the authors. The commentaries on the Bible and the Talmud from the tenth century to the present day might very well be the fruits of a dead tongue, but when one reads with familiarity and facility the poems of Shemuel han-Nagid, Jehudah hal-Levi, Ibn Gebirol and Aben Ezra, one is convinced that in Spain from the ninth to the fifteenth century Hebrew at least equally with Arabic was the living spoken language of the great mass of the Israelites. These works were never produced as were the Latin University exercises of our youthful days, "written up by the help of a gradus." The great extent of the vocabulary, the facility and fluency and the very word-plays all testify to life.

THE LOWEST LEVEL.

We may, however, fix the date of the Expulsion from Spain (1492) as the commencement of a period of decline of Hebrew as a tongue spoken for purposes of daily practical use. The Jews were now more scattered than ever. There was a clear distinction between Sephardim and Ashkenazim, and they were again in many ways separated from their brethren in the East. Around the Mediterranean the Sephardic pronunciation held sway, but there were modifications in Africa, Italy and elsewhere. The Ashkenazic pronunciation was unintelligible to these southern Jews, and it had many "dialects," of which

thirteen have been reckoned in Poland alone. In such conditions Hebrew as an international speech was impossible, and even communities that enjoyed uniformity of pronunciation became accustomed to employ their second language—Jargon, Ladino or Arabic, as the case might be. The decline went on, and we may consider that in the middle of the nineteenth century Hebrew had sunk to its lowest level as a practical daily language. This was equally the case in Palestine, and in 1890 we made inquiry and learned that only about a dozen persons all told in Tiberias and Safad together professed ability to carry on a conversation in the holy tongue.

UNDESIGNED PREPARATION.

But Hebrew, in addition to being the universal religious language of the Jew, had maintained by persistent usage its place as the general literary vehicle. Then the Mendelssohn school had emphasized the value of Gentile education and literature, and many Jews sought to make its acquaintance. Good translations of the best English, French and German works were made, and we remember in the 'eighties the existence of Byron's Hebrew Melodies, a few of Shakspeare's plays, one or two of Scott's novels, *Robinson Crusoe*, while Milton's *Paradise Lost* was translated on Jewish lines of thought and sold in Jerusalem for one franc. *The Wandering Jew*, by Eugene Sue, had naturally a place, and Schiller's works were favourites, while the Koran was printed in unpointed Hebrew, and selections from *Kalilah wa-Dimnah* (Fables of Pilpay) were greatly relished. Then from the year 1837 newspapers began to appear in various places printed in Hebrew. One of the best of these, and a great favourite in Palestine fifty years ago, was *haz-Zephirah*. It was published in Poland, and both as a news-sheet and a literary review it was well fitted to take a place alongside of the best products of the European press. In the 'eighties Ben Jehudah, the great champion of Hebrew as a spoken language, settled in Jerusalem. In connection with his propaganda he issued a weekly which he named *haz-Zebhi* (The Gazelle). Very soon a rival named *Chabbatzeleth* (The Rose of Sharon) appeared, and these satisfied Palestinian needs for two decades. An interesting incident occurred in connection with the rivalry between these two weeklies. Ben Jehudah expressed the wish in one issue of his paper that the modern

Jew might manifest something of the spirit of the Maccabees. Reported to the Turkish Government this was regarded as treasonable. Ben Jehudah was imprisoned, and his paper stopped. Through the usual method he was liberated, but even backsheesh could not secure the publication of the old paper. He was, however, allowed to publish another which he named *ha-'Or* (The Light). When the next issue of *Chabbat-zeleth* appeared, the following hit at its rival stood prominently forth: METH HAZ-ZEBHI WENISHAR HA-'OR, "the gazelle is dead and the skin remains." We have here a pun on 'Or, light, and 'Or, skin; but the victory was Ben Jehudah's, for the language had attained to a life that made even puns possible and enjoyable.

FACILITIES.

The advent of Ben Jehudah became with time the greatest impulse toward the real renaissance. But he had much to endure for many years. The great mass of the Chassidim, constituting the majority of the population of the ghettos, considered Hebrew too holy to be spoken, except on the Sabbaths, and then if they tried it they were more conspicuous by their silence than by their speech. They engineered every possible opposition to him, and induced others to do likewise. Attempts were made to starve him out, he was cursed by his own people, stoned on the streets, falsely accused and imprisoned, but he persevered. Hebrew became the language of his own family, and gradually of a widening circle of friends and sympathisers, and by the close of the century it had found a secure footing in the land and in the affections of multitudes, who but a few years earlier had looked upon its use as a profanation. Accordingly it was no mere sentiment, but a real necessity, that in 1918 gave Hebrew a place as one of the three official languages of Palestine. Ben Jehudah lived to see the success of his efforts, and now the children of his opponents honour his name and raise monuments to his memory.

Still the times were favourable to the purposes of Ben Jehudah. The earlier colonies had been established, and persecution in other lands was driving in a different class of Jew from those who occupied the ghettos and lived on Chalukah. The various sections of the ghettos, each with its own tongue, were breaking down or getting mixed. There was need of a common speech.

Jewish settlers of even several generations knew little Arabic, and immigrants knew none. It was useless, and as a matter of course all took to the language they had in common. Ben Jehudah had, with great wisdom, adopted the Sephardic pronunciation. It was more genuinely Semitic, and its use reduced to a minimum a good deal of false idiom that might have come in with more Ashkenazic influence. It was universally accepted by all classes, and we never heard of any manifestation of "intertribal jealousy" in this matter. We have thus now a compact population, German Jews, Spanish Jews, Jews from Yemen (Arabic), Bokhara (Turkish), and Persia with similarity of speech and pronunciation.

It must also be remembered that every Jew has from the first an adequate vocabulary for beginning conversation. It has been calculated that with a command of 500 words one may go a long way in understanding and being understood. We have tested the matter several times, and found that much that is still in doubt in conversation can be fairly well guessed, confidence is attained, and rapid progress is made. Now every Jew has more words practically at his finger ends. He knows the Torah, the prophetic sections, the Daily Prayer Book, and a good deal of Machzor, and these give him an ample stock for the ordinary conditions of life in Palestine, and for any particular sphere of employment he soon gathers his vocabulary.

THE LANGUAGE ITSELF.

We sometimes hear distinctions drawn between Ancient Hebrew and Modern Hebrew, but such designations are misleading. The difference is no greater than, say, that between the Authorized Version of the Bible (1611) and a modern book or well-written newspaper. The whole vocabulary of the Bible is used in modern speech. There are, indeed, small differences in grammar, idiom, and a more extensive word formation, but all are on pure Hebraic lines, and there remains only a small and diminishing list of foreign words. We shall take up the essential points of "modern" Hebrew now in due order.

THE PRONUNCIATION.

We have indicated that the Sephardic pronunciation was followed. This corresponds with what we call the Academic,

which, fortunately, through the teaching of Reuchlin, a disciple of the Sephardic Sforno, became the accepted mode in Great Britain. In conversation, however, there are some differences. When without the dagesh only three of the begadh-kephath letters are aspirated—Beth, Kaph and Phe. Then there is a distinct advantage in the accurate pronunciation of the ‘Ain and in the clear distinction made between the He and Cheth. The presence of Arabic has probably compelled acceptance in these three cases.

THE MODERN SCRIPT.

We naturally take notice of this as being the Ashkenazic contribution, which, equally with the Sephardic pronunciation, has been universally accepted. It has one small disadvantage, and that is it is not well adapted for vocalizing, but as the vowels are seldom used with it except in the case of unfamiliar proper names and foreign words, there is but small loss. It is now used by all classes for all ordinary purposes.

THE GRAMMAR.

The Old Testament literature, in virtue of its small extent, does not present us with all the possible forms of the verbs, nor with all the plurals and constructs of the nouns. Perhaps not in one single verb are all the parts found, and we used to be told that the Dual Construct for “two kings of” was non-existent, though occurring in every grammar. But many of the blanks may be filled up from subsequent literature, and we now feel that we are entitled to use all the parts grammatically possible of all verbs, nouns and adjectives, subject only to the limitation that in some cases there might be passives, reflexives, reciprocals, or occasionally a plural to an abstract term that would be sheer nonsense.

A noticeable addition to the Old Testament grammar is the Passive of the Hithpa’el bearing the form and name of Nithpa’el. It is found in the Mishnah, and has been frequently used since the second century.

The Vav Conversive (Consecutive) is seldom used in conversation, but it maintains its place in the written language.

The use of the particle SHEL, derived from ‘ASHER L- (*cf.* already Jonah i, 7) is very common. It really means “of,” and aids in the formation of the genitive case. This usage may

not be so neat as the old construct arrangement, but it adds definiteness in many cases, and makes possible the use of the article with both the construct and absolute positions. Thus, if I say MALKATH HA-'ARETZ HAṬ-ṬOBHAH, there may be a doubt as to whether I mean "The good queen of the land" or "The queen of the good land." The new construction, however, gives us a different form for each, HAM-MALKAH HAṬ-ṬOBHAH SHEL HA-'ARETZ and HAM-MALKAH SHEL HA-'ARETZ HAṬ-ṬOBHAH.

THE VOCABULARY.

This contains, of course, all the words of the Old Testament. Thereafter the first necessities of the new colonists for agricultural terms and the names of the fruits of the ground were met by drawing upon the Mishnah. During the Jamnia period of Jewish history all the vegetables and fruits then known were cultivated in the Plain of Sharon, and the Israelite through systematic land cultivation gained a knowledge that enabled him to produce the treatises on the subject that are found in the Zera'im section of the Mishnah. For modern importations designations have been found by imitating European formations as in the case of TAPPUCHE 'ADHAMAH (earth apples) for potato; TAPPUCHE ZAHABH (apples of gold) for oranges, or by translating the idea contained in the European name, as 'AGHBANIYAH (pomme d'amour) for tomato.

Then in the Middle Ages the Jews were great medical practitioners. In this connection they studied and translated the works of other peoples. They did not, however, take over the medical terms in foreign form, but translated them into their own Hebrew speech. A book has recently appeared with a complete medical vocabulary, most of the words being drawn from the older literature, with additional necessary modern terms invented on legitimate lines.

The Jews also from the eighth century onwards were great philosophers. It is true that the majority of such works were originally written in Arabic, but they were very soon presented in Hebrew dress, mainly through the efforts of the Ibn Tibbon family. A Hebrew philosophical vocabulary was wanted. The older language had been very deficient in abstract terminology, but now the need was immediately met. Arabic and Aramaic terminology supplied models, and the abstract termination in -UTH began to play a great part. All needed terms were produced,

of which the following examples may suffice: YESHUTH, being existence; KAMUTH, quantity; 'ECHUTH, quality; 'ELAHUTH, divinity; 'ENASHUTH, humanity; with SIPHRUTH, literature. From these nouns, too, it was possible to form adjectives by the addition of the termination -I, as 'ENASHUTHI, SIPHRUTHI. The earlier philosophical vocabulary was considerably extended by the Kabbalistic writers. The beauty of this terminology is that the words are derived from the roots on uniform and simple lines, and are thus universally intelligible.

Modern inventions in former times brought their names with them. In our earlier days we were familiar with such words as telegram, telephone, post, vapor (steamer), billet and samovar, but all these have now Hebrew designations that are in daily use. In the formative period for such words "telegraph" for a time assumed the form DOLEG-RABH (springing afar) as an imitative, but now we have MIBHRAQ derived from BARAQ (lightning). Revolver was for a long time QANAH-ROBHEH (a throwing tube), but now it is 'EKDACH. During a visitation in Safad the rather neat form CHOLI-RA' (evil sickness) made its appearance for cholera.

Words are being formed as occasion arises, and on clear legitimate lines of derivation. We do not usually think so, but it must be remembered that Hebrew possesses powers of word formation scarcely equalled by even Greek or Gaelic. Hebrew grammars (*e.g.* Gesenius-Kautsch) set forth about sixty possible formations of nouns from a single stem. Modern speech has added, if not invented, two more very useful forms—HAQTALAH and HITHQATELUTH. Thus we have HAGHDALAH, enlargement; HASHLAMAH, completion; HITHHALLELUTH, self-praise, boasting; HISHTADELUTH, endeavouring. A short time ago we required a word for "self-teaching" or "Selbst-unterricht," and almost unconsciously used HITHLAMEDHUTH. We never saw it anywhere, and it is not in the dictionary, but it was perfectly well understood by every hearer. Some months ago we visited the Technicum at Haifa, and seeing the great variety of tools in use, asked how names were got for them all. We were shown a list prepared for newcomers with explanations in English, German and Russian. All were good Hebrew and perfectly intelligible to any one who knew the simple stems.

We believe that the number of foreign words in actual use does not exceed one hundred. These are mostly connected with modern inventions or international political conditions, and for

such the newspapers are generally responsible. Words like "constitution" and "parliament" look ugly in Hebrew, while "status quo" unpointed is puzzling. These will probably be soon replaced by genuine Hebrew words. Some modern terms, however, are based on ancient foreign roots long embedded in the language. Thus from the Greek *'Aer* (air), the Midrashim formed a Hebrew word *'AVER*. Thence there have been produced *'AVIRI*, airy; *'AVIRAN*, aeroplane; *'AVIRANUTH*, aviation. From the Greek *Lestes* (thief) we find the Midrashic, *LISTIM*, highwaymen, and *LISTUTH*, robbery. Such words will maintain their place in the language. But as it is, we have already attained to the *SAPPAH BERURAH*, "pure speech" of Zeph. iii, 9. Of all modern languages Palestinian Hebrew is the purest, and this position will likely be perpetuated. To this end there is in Jerusalem an association which might very well bear the name of *Academia Hebraica*, though it is not yet so called.

JEWISH PALESTINIAN EDUCATION.

The Jew is never illiterate. In all our association with them we have never met a man, and seldom a woman, who could not read and write some language. Accordingly it was quite natural when colonies were being established that the village school should be the first consideration. Then Zionism linked itself with the Hebrew tongue, and so it became at once the medium of instruction. As soon as children get past the creeping stage they are introduced to the kindergarten (*GAN-HAYELADIM*), and thence to the equivalent of our primary schools. Many of the teachers, too, are scholars of good standing. One of these we met had been head-mistress of a high school in Bohemia. She spoke with facility German, French, Russian and Hebrew, but had willingly given up all her bright prospects that she might aid in "the building of Zion." A companion teacher in the same colony had made a fine collection of fossils and geological specimens that for Palestine was almost complete. In such schools the whole of the teaching is in Hebrew. Everything is "Hebrew in Hebrew"—reading, writing, history, geography, arithmetic, all in the holy tongue. A generation has grown up under this discipline, and now Hebrew is the language of the home everywhere. Travelling the other day there was with us a young mother with her two-year-old boy. She sang to him as the day wore on the Psalms of David in the very words of the

poet. Our own conversation was a little more secular. Wishing to test his intelligence and knowledge, we addressed him as if he were a girl by using feminine adjectives. Very soon we got the response that he was YELED LO YALDAH, "a boy and not a girl."

Secondary schools find place at several centres, especially at such colonies as Tell Aviv, while there is a Training School for Teachers in Jerusalem. These will multiply and improve as time goes on. They add to the Hebrew teaching of the junior schools instruction in sciences, art and languages. These lead up to the Technicum, a well-equipped technical college at Haifa, and to the University of Jerusalem. This institution, opened by Lord Balfour on 1st April, 1925, has made steady progress. It has hitherto given only certificates, but is just on the eve of conferring its first degrees.

By this persistent use of Hebrew from the earliest years under competent teachers the chief pitfall in such a renaissance is being overcome or prevented, that is the introduction of foreign idiom. As a rule each new immigrant comes with another language whose idiom is of another kind, and mistakes made by simply translating are sometimes extremely amusing; but the schools and the reading of well-edited literature very quickly eliminates these faults, and the second generation in the land is entirely free from them.

OUTPUT OF LITERATURE.

This embraces every department of knowledge—educational, secular and sacred. The first Hebrew book printed in Palestine after the British occupation was a dictionary in which Hebrew words were explained in Hebrew, the only exception being that in the case of the rarer plants and animals explanations were given in footnotes in English, German, French and Russian. All the needs of the schools are provided, and the books produced would do credit to our best authors and best publishers. Maps and scientific charts are all in Hebrew. Then there are even advanced text-books for all the sciences—algebra, geometry, chemistry and botany. We have before us at the present moment a classification of plants, according to the best systems, and more intelligible than even in English, for the root of every designation tells its own story.

Children's picture books and children's newspapers abound, with their conundrums, puns and crossword puzzles, and they

are not mere imitations or adaptation of European models. All is Hebrew in word, mentality and spirit. Then the best of all the literatures of the world has been translated. We select a few names at random—Shakspeare's plays, Goethe's poems, Gulliver's Travels, the works of Jack London and Rudyard Kipling, Sherlock Holmes and the stories of the Iliad and the Odyssey. In addition, all kinds of original works are appearing, including a good deal of fiction.

Then the Jew has always been a philosopher, and of each aspect of philosophy we are getting a supply. One of the professors of the University is busy on Aristotle's Philosophy. This may seem a small thing to the uninitiated, but it must be remembered that he was the controlling power of the Middle Ages, and a consideration of his influence entails a knowledge of both Judaism and Christianity in exact detail through many centuries.

And the Bible is not forgotten. Commentaries on the individual books are printed, giving the text with the poetical portions divided into lines and strophes, and with short but adequate comments in pointed Hebrew. Critical investigation of the text appears in such works as *CHIQRÉ MIQRÁ* on Job, in which an attempt is made to get at a clearer understanding of Hebrew rhythm, while another elaborate commentary on the same book gathers up all that the latest Christian scholars have written along with the best Jewish work on the same subject.

We have also reprints of all the older literature of Israel, got up in form something like Reclam's Universal Bibliothek. Individual tracts of the Mishnah with a modern commentary cost $2\frac{1}{2}d.$, or, with the Commentary of Bertinora, $3\frac{3}{4}d.$ Selections of the best of the poems of Samuel han-Nagid, Ibn Gebirol, Aben Ezra, Jehudah hal-Levi and Alcharizi can be got at like prices, and these are supplied with footnotes on strange words or subject-matter. The young colonist, however poor, may at very small cost get into touch with the whole literature of his people, and possess a great quantity of the best of it. Indeed, the remarkable thing about the colonies is the small select library that practically every settler has gathered.

PRESENT CONDITIONS.

At the present moment 98 per cent. of the Jewish population of Palestine speak Hebrew. That means 160,000, and all are

enthusiastic for the language. Children up to 12 years of age generally speak nothing else. The non-Hebrew-speaking Israelites consist of the Chasidim in the holy cities. Most of them have got over their prejudice against its secular use, but generally they have been too old to acquire facility in speaking. In so far as the printing press is concerned other languages have disappeared. Nothing is now printed in Yiddish-Jargon, Ladino (Judæo-Spanish) or Judæo-Arabic. Yiddish and Spanish are still useful at the ports of Haifa and Jaffa, but elsewhere they are allowed to go. There are three Hebrew dailies and several magazines, and the printing presses in Tell Aviv turn out 300 Hebrew books every year. That means an intelligent reading public and a language that has come to stay.

GENTILE INTERESTS.

The first of these is naturally the interpretation and understanding of the Bible, especially the Old Testament. The Jew has commenced this on modern lines, and he will continue it with the advantage of carrying it on in the land of origin, and in the light of all that his predecessors have written; and Christian scholars also will make the language their own as a living speech. In the past critical work has been too much a matter of concordance and grammar, and all has been at the best very mechanical and at times clumsy and inherently objectionable; but with a living language style will be really appreciated. Think of the joy and satisfaction, too, of the scholar who, with accurate pronunciation and exact accentuation, can read aloud the old psalms and the poetic portions of the great prophets! We are on the eve of great revelations in connection with the Old Book. A word of warning may be necessary. In Hebrew, as in all other languages, words change their meanings in the lapse of ages, but in the case of the Old Testament we have sufficient ancient material to keep us right, and gains in word-interpretation may only amount to what modern Greek gives us for the Greek New Testament.

But the modern student's Hebrew must be also colloquial. He must be an efficient scholar in that language, and to this end he will find facilities at the University of Jerusalem. The Chancellor and the staff are most cordial in their desire to welcome Gentile students, and for those at every stage there will be suitable studies. The young undergraduate might take up language,

literature and history, or Bible fauna and flora, and such studies as throw light on Old and New Testament alike; while the advanced student, coming with an Honours degree, might very well, after an attendance of two years, have a Ph.D. of Jerusalem. Jerusalem is in very deed "a strategic centre" in matters of literature, science and Biblical interpretation.

The relations of Christian and Jew in the matter of mission work is hardly within our sphere, but at the present moment many a Jew is intensely anxious to discover the link between the Old Testament and the New. That almost sums up what the missionary has been attempting for the Jew. Only in the past it has been done with an inadequate knowledge of the Jew, his mentality, his literature and his aspirations. There has been a persistence in the use of Arabic in Palestine in dealing with the Jew, even when it was to him an acquired language. Whatever language the Jew spoke, his religious vocabulary was always Hebrew. He knew nothing of "mediator, atonement, repentance, salvation, redeem, justify," and such like in anything but Hebrew. To the ordinary Jew "Allah" was the god of the Arabs, just as Chemosh in old time was the god of Moab, and to Allah the Christian sought to convert the Jew. Now there will be facilities with this one language, and that the language of religion. The preacher will require but that one language, and not half a dozen as in past days. There will be time to reach an understanding on things Jewish. Jew and Christian will understand one another better. The Christian needs the Jew just as much as the Jew needs the Christian, and through Jerusalem, the strategic centre, Christianity may, through the Jew, get pruned of many of its superfluities—mostly heathen—and brought back nearer to its primitive form.

CONCLUSION.

More than a century ago, Trelawny, the friend of Byron and Shelley, declared: "No people, if they retain their name and language, need despair." These have been invariably the charter of liberty and the guarantee of nationality. For nearly 4,000 years the name of Israel has had a place among the peoples of the world, and their language has an unbroken history from the first verse of Genesis till this very hour, and although within our own lifetime it was as a living tongue threatened with extinction, it has been restored to its rightful place in the world

by the irrepressible efforts of the great Ben Jehudah, backed in due time by the great Zionist movement.

The hour came and the man ; but there was a divine preparation for the results during almost two millenniums. Peasants in the Plain of Sharon, poets and philosophers in the Spanish Peninsula, medical practitioners in Provence, grammarians, commentators, and travellers all contributed unconsciously to the end now fully attained—the renaissance of the Hebrew tongue.

And this revival of the speech of Israel is but a symbol of the renewal of the people as a nation. Not only in mentality and breadth of outlook is the Jew of to-day a different man from his predecessors of half a century ago, but physically the whole people has been completely changed in a single generation. Instead of the frail, sickly, blear-eyed populace of the holy cities of the last century we have now the stalwart, clean-living, clear-thinking, independent tillers of the soil in 100 Jewish colonies. Such men and women are being prepared for great things. Israel played a great part in the Old World's history. We see in the Divine Providence, so manifest in all that has been done, a guarantee of preparation for great events through Israel in the coming days.

DISCUSSION.

The CHAIRMAN (Dr. Thirtle) said : The paper sent to us by Dr. Christie cannot but excite the deepest interest in its appeal to men and women whose eyes have been fixed upon the Holy Land during recent years. Simultaneously with the recovery of the land from the desolation of ages, we have witnessed the coming together of a people descended from the old-time possessors of the land, inheritors of a marvellous tradition, warmly cherished during long centuries of exile in the midst of the nations of the earth. Though for many generations alienated from the homeland of their ancestors, yet, in response to some mysterious urge, the Jews have turned their feet to a soil made sacred by great events of past days, and invested (in the minds of many, at least) with a continuing vitality by reason of " things to come," foreshadowed in the writings of prophets, wise men, and scribes of the House of Israel. And, strange to say, as

shown in Dr. Christie's paper the ancient speech, during long generations known as "the holy tongue," has been given back to the returning tribes. Here, assuredly, we contemplate a truly marvellous providence. And however strong and vital may be the tradition that lies at the back of the modern development, we must recognize that the Book that we all revere and read is providing, in its substance and integrity, the speech that is designed to enrich the Jewish people in the rebuilding of their National Home.

Happy is the nation that comes into such a heritage of blessing ! The extent to which the Sacred Scriptures of the Old Testament have contributed to the Renaissance of the Hebrew language has been shown by Dr. Christie in his comprehensive statement of facts and principles ; and we find that, now at length there is prevailing among the Jewish people, and regarded as a peculiar treasure, a tongue of truly noble characteristics. From whatever land the pioneers—the immigrants—have come, they choose and employ—not the tongue of the market, not the tongue of social life as spent in the lands of dispersion, but rather, and emphatically, the tongue of prayer and praise, the tongue that, from ancient days, has served them in hours of sacred worship and holy meditation ; and in a time that is already opening upon the people of Palestine, we shall see that, for every purpose of life, during every day of the week, the month, the year, the Jews will converse in words made holy by the exercise of prayer. Is it not wonderful ? And can it be other, in the good providence of God, but that the nation will reach a new experience, high and ennobling, as they realize the prophetic outlook given forth thousands of years ago : " I will turn to the people a pure language, that they may all call upon the Name of the Lord "—provide them with a " pure lip," or speech. How else can a people build after the manner of God, in order to the saving invocation of His Name ?

What have we seen ? With a strange enthusiasm the people have surrendered forms of utterance and conversation that have served the purposes of life in exile, and then have proceeded to cultivate the tongue of days when the Word of God had power among them as a nation ; they have herein been led along a way that no other nation has travelled. In the days of mourning and sorrow a composite Jargon that was not without its charms was used for the common concerns of life ; but all along in acts of piety

the people have read the Scriptures in Hebrew, or at least envied the privilege of doing so, and sought the heart of God in prayer in the same sacred language, at least when following the regular forms of worship. Hence the "pure lip," having assumed control of heart and mind, men, women, and children seek to employ the same medium of speech in regard to all and every concern in the daily round of life. Can it but be that the higher aims and deeper activities will sanctify such thoughts and intents as are merely commonplace? May not this be in the Divine design as it affects the renaissance of the holy tongue?

As we have heard, the tongue which has thus been accorded a national preference is equal to all the needs of life. Is it old? None the less is it new; and this fact is being found out day by day. We may watch the process. As is well known, before going abroad, thoughtful men and women study some language or languages, so as to be able to make themselves understood; they lay in books of travel, with instruction in regard to conversational methods, and they labour at lists of words and phrases. Such has been, and, indeed, such is, the present passion of backward "pioneers" among Jews going to Palestine. And for the use of such there have been issued from Jewish printing-houses and book-shops, in the East of London, as well as in continental centres of Jewish activity, grammars, dictionaries, and other books specially suited for people going to a land where the Hebrew tongue is spoken. In the old days, as we know from certain Books of the Bible, the Hebrew language incorporated loan-words from Egypt, Persia and surrounding countries, and it is the same to-day, as latest lexicons and grammars of the Hebrew language plainly show. Words from classic sources, and modern continental tongues are readily received and systematically Hebraized, with a result that plainly shows that the old tongue has, in the providence of God, been preserved for such a time as this.

It gives me much pleasure to call for a hearty vote of thanks to Dr. Christie for the paper which we have heard this afternoon. The resolution was carried with applause.

Mr. PERCY O. RUOFF expressed regret at the absence of the lecturer, and acknowledged indebtedness to Dr. Thirtle for the

illuminating emphasis with which he read the paper. The speaker proceeded : The paper is informative and highly interesting, especially in regard to the modern developments of the Hebrew language. It is probably true that the key to a nation's intellectuality is its vocabulary. The references on pp. 77 and 79 to the relations of Christians and Jews are significant, notably the printing of the commentary on Job, in which Christian scholarship and Jewish work are combined.

In a book by the late Henry Craik (a Hebrew scholar), entitled *The Hebrew Language*, published in 1860, there are four short paragraphs relative to the subject :—

“(1) In the 12th century, Raymond, a monk of the Dominican Order, attempted to revive the study of Hebrew in the Church, and in 1311, Pope Clement the fifth published a decree requiring that in every university in Christendom, there should be appointed six professors of Hebrew and the cognate dialects ; but for the space of two centuries, it was found impossible to provide a single professor in any University with the exception of Oxford.

“(2) It may safely be affirmed that Hebrew has been more thoroughly investigated since the early part of the 18th century, than it had ever been for, at least, 2,000 years before.

“(3) The number of distinct roots in the ancient Hebrew may be reckoned rather under 2,000 ; and the number of words altogether does not probably exceed 7,000 or 8,000.

“(4) In copiousness of diction, in variety of phraseology, in definite exactness, in capability of indicating distinct shades of meaning, the Greek excels the Hebrew ; but in a pervading moral element, and in a species of pictorial expressiveness, the more ancient language bears away the palm.”

MR. SIDNEY COLLETT called attention to one point in the paper. Dr. Christie, in his opening remarks, said : “ The common opinion, even amongst educated people, is that, during the captivity in Babylon, the Israelites forgot the Hebrew language, and came back an Aramaic-speaking people.” The lecturer implied that such an opinion was faulty ; and yet on p. 68 he says : “ It is quite true that Aramaic was the common speech of the people.”

I believe it is a fact that, during the Babylonish captivity, the priests and rulers of the Jews retained among themselves the

knowledge of pure Hebrew, but that the people generally, after living so long in the land where the Chaldean language was spoken, in course of time lost the purity of their original Hebrew, and spoke what was practically a mixture of Chaldean and Hebrew, known as Aramaic.

It was probably owing to this fact that we read in Neh. viii, 8, when the Jews had returned from Babylon, the Levites "read in the book of the law of God distinctly, and *gave the sense, and caused them to understand the reading,*" which would otherwise have been impossible, as the reading was in pure Hebrew (as was always the case when the Scriptures were read), while the people only understood Aramaic.

Moreover, it would appear that Aramaic was the common language of the people in the time of our Lord, for words spoken by Christ, on more than one occasion, are given in clear Aramaic form, as, for example, *Talitha cumi* (Mark v, 41), and *Ephphatha* (Mark vii, 34). See also Matt. xxvii, 46.

Lt.-Col. SKINNER said: Surely no one can have listened to this wonderful story of the renaissance of the Hebrew tongue, coupled as it is with the rebirth of the nation itself, after nearly two thousand years of unexampled persecution, without a deep stirring of heart for God's ancient people. Put but three facts together, the Book, the People, the Language, and, having in view their miraculous preservation through all these long centuries, must we not surely conclude that some wonderful purpose of blessing to mankind through His ancient people awaits the unfolding of the Divine plan?

A word in reference to the sentence on p. 78: "We are on the eve of great revelations in connection with the Old Book." Many years ago I was privileged to have some close association with Dr. John Goldstein, then a young medical student, a Jewish convert whom the Mildmay Mission to the Jews had brought to England from inimical surroundings on the Continent: he is now, I think, working in Salonica. He and Marshall Broomhall and I had had two days of very happy fellowship, and a Bible-reading being suggested, we got the family together round the Word. The portion selected was "The blessing wherewith Moses, the man of God, blessed the children of Israel," and never in all my experience

have I heard anything to equal the unveiling of God's heart of love for His beloved people, by Goldstein, who was only a boy, but to whose Spirit-instructed Hebrew mind the deep things of God lay open as to no other. The impression left on my mind after thirty-four years is ineffaceable.

Mr. WILLIAM C. EDWARDS spoke of Dr. Christie as a learned and valiant champion for the truth. He continued: During my recent stay at Haifa I met him frequently, and saw something of his work. Every Saturday there was a meeting for Jews, which was often crowded out. Addresses were delivered in various tongues. At times there was English, then a great deal of Jargon, otherwise called Yiddish, and then again Hebrew. Mr. Rohold, besides English, could be eloquent in Arabic, Hebrew, and Yiddish. As to the paper read, the speaker declared that its correctness was apparent to all who had visited Palestine during recent days. There is Arabic, of course, also German and English, but above all, there is everywhere evidence of the spread and penetration of the Hebrew language, as Dr. Christie had made abundantly clear in his paper.

WRITTEN COMMUNICATION.

Brig.-Gen. HARRY BIDDULPH wrote: "I presume that Dr. Christie's remarks on the knowledge of Hebrew by the Jewish people apply in particular to European Jews. I recall that some twenty-five or more years ago I was stationed at Poona, in the Bombay Presidency, and among the clerks in the Government office where I worked were two Jews, named Joseph and Daniel, the elder being an office accountant and a man of education. He conducted me one day over the synagogue, which had been built by David Sassoon, who lies buried near the entrance. I soon ascertained that the ignorance of my friend in regard to elementary matters of the Jewish Scriptures and faith was abysmal. I remember commenting at the time on the fact that we had Roman Catholics, Moslems, and Jews, all worshipping in unknown tongues—namely, Latin, Arabic, and Hebrew. I have no reason to think that such ignorance as my friend displayed was in any respect unusual in the Jewish community in Poona.

THE LECTURER'S REPLY.

The question raised by Mr. Sidney Collett is one of old standing, and yet ever new. My old teacher, Franz Delitzsch, started the translation of the New Testament with the idea that the "Mishnah Speech" was that of Palestine in the first century. While some sections of the Mishnah consist of concise legal terminology—the language of the schools—other portions as also the Hebrew Haggadic parts of the Palestine Talmud, are so full of life and so free from the mechanical, that they must represent actual speech, and that not merely of the learned, but of the life of the home.

In the Levant the question of linguistic boundaries has always been difficult. Apart from the Arab peasantry of to-day the Oriental has seldom been monolingual. In Christ's day the men of Galilee must have spoken Greek, and a St. Andrew's Professor wrote two volumes to prove that the Gospel teaching was given in that language. We do not agree with him; but it is to be noted that there was not the same objection to that language in Galilee as there was in Judea. In 1891 we discovered a Jewish tombstone (Cent. IV) at Sepphoris (one of the seats of the Sanhedrin) with a Greek inscription giving the genealogy of an *archisynagogos* for three generations. But Aramaic had its place, and we believe it was the language of the homes. The position may have been something like that of Safad forty years ago. Then the women seldom spoke anything but Yiddish, and that after generations of residence, while the men as a rule spoke also Arabic, and frequently some other language.

In connection with Christ's use of Aramaic there is a psychological fact to be considered. There is an inherent compulsion that makes people speak with one another the language of their first acquaintance. Personally I found it very hard to speak English with the male members of my German Congregation in Aleppo, although they knew it as well as I did. In the homes, Christ most likely used Aramaic, and hence its use on the occasions recorded. But that does not exclude a knowledge of Hebrew as another colloquial.

General Biddulph's note claims attention. It is well known that the Jews discovered in Central China, the Falashas of Abyssinia, and probably others have no Hebrew. Business Jews, too, even in

Europe are careless ; but few of them have not " the necessary 500 words." Probably, too, among the very poor in the actual ghettos of India a more extensive interest might be discovered.

The language progresses by " leaps and bounds." Shakespere's " Twelfth Night " is at present being presented in a local theatre. Three comic papers on Purim have just come in ; and to-day (February 3rd) there was handed to me a tin-smith's or tinker's advertisement leaflet, in Hebrew. It touches every phase and stratum of life, and even the Arabs are learning it for business and trade purposes.

I desire to record my sincere thanks to Dr. Thirtle for his presentation of the paper, and for his illuminating contribution to the subject.

742ND ORDINARY GENERAL MEETING,

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL,
WESTMINSTER, S.W. 1, ON MONDAY, FEBRUARY 2ND, 1931,
AT 4.30 P.M.

E. A. MOLONY, ESQ., C.B.E., IN THE CHAIR.

The Minutes of the previous meeting were read, confirmed, and signed, and the HON. SECRETARY announced the election of Mrs. Ronald S. Murray as an Associate.

The CHAIRMAN then called upon Mr. W. N. Delevingne to read his paper on "The Influence of Christianity on Indian Politics."

*THE INFLUENCE OF CHRISTIANITY ON INDIAN
POLITICS.*

By W. N. DELEVINGNE, ESQ.

THE subject on which I have been asked to address you this afternoon is, as the title indicates, a very wide one, and in the time at my disposal I can do no more than set forth in brief outline how and through what channels Christianity has been working upon the lives and characters of the peoples of India and its consequent influence upon the politics of the country at the present day. To what extent that influence

has made itself felt in moulding the political ideas of the Indian peoples can only be inferred, of course, from the facts of history, and must be, largely, a matter of individual opinion, but I hope to be able to show that it is much more powerful and extensive than is evidenced merely by the growth in the number of Indians who have become followers of the Christian religion.

Christianity found its way to India at a very early date in our era, but its advent is so overlaid with legend that it is impossible to say with any accuracy by whom or in what year the Gospel of Our Lord and Saviour was first preached to the people of the country. This much, however, can be said with certainty, that Christianity had reached Malabar on the south-west coast of the Deccan before the end of the second century, A. D., and that by the end of the fourth century a flourishing church of Syrian Christians had been established there. In the second century a Roman merchant fleet sailed regularly from Myos Hormus on the Red Sea to Arabia, Malabar, and Ceylon. It found an ancient Jewish colony, the descendants of which still remain to this day as the Beni-Israel, upon the Bombay coast, and in the course of the trade which it carried on with this Jewish settlement, it doubtless brought with it Jewish merchants and others acquainted with the religion of Christ, which, starting from the land of Palestine, had spread throughout the Roman Empire. Its doctrines and its revelation of the Supreme Being as a God who was holy and righteous in all His ways, yet regarded His erring creatures with infinite love and compassion, won for it a favourable reception from the Buddhist princes who ruled in Southern India, and so rapid was its diffusion that, by the sixth century, Kalyan on the Bombay coast had become the seat of a Christian bishop from Persia.

The Christianity that established itself on the western coast of India in the early centuries of our era soon degenerated from the true faith of the primitive Church. The earliest authentic records that have come to light show beyond doubt that at the middle of the sixth century the doctrines of Nestorianism had been accepted by the Christian settlements on the Malabar seaboard. Cosmos Indikopleustes, an Egyptian monk and traveller, and the author of a work on geography and theology entitled *Topographia Christiana*, records that he found a Christian Church on the Callian, or Malabar, coast, and he adds that the bishop who was at the head of it had been consecrated in Persia. The Christian Church in Persia was founded by the

Nestorians, who, after their expulsion from Europe, had been driven by Imperial decree into that country, and had thence sent missions into Bactria and India. It is well to remember, in this connection, that the Christianity which flourished in Asia during the succeeding thousand years was the Christianity of either the Nestorians or the Jacobites (originally an offshoot of the Monophysites) and, together with Buddhism, formed a bulwark against the advance of Islam. Gibbon in his work, *The Decline and Fall of the Roman Empire* (vol. viii (1832), p. 354), states that, under the reign of the Caliphs, the Nestorian Church was diffused from China to Jerusalem and Cyprus, and their numbers, with those of the Jacobites, were computed to surpass the Greek and Latin communions.

The influence of the Nestorian Church in India, however, was never extensive. It suffered from contact with the idolatrous religions by which it was surrounded, and its life was neither strong nor vigorous. At the beginning of the sixteenth century, when the Portuguese arrived in India, the Malabar Christians were governed in religious matters by a regular episcopacy, and they had secured for themselves a recognized position among the Indian princes who were their immediate neighbours. The followers of the Roman Church, in their zeal to make proselytes, soon came into conflict with the Nestorian Church, and there was seen the unedifying spectacle of one body of professing Christians endeavouring by force and the use of the iniquitous Inquisition, to compel another body to abandon their own beliefs and accept the former's creed. Rivalry between different Christian sects is, unfortunately, not unknown in these days, and it may probably be said with truth that one great hindrance to the spread of the Gospel in India has been the divisions and dissensions that have destroyed the unity of the Christian Church.

The Portuguese failed to maintain their hold on India, and, with the coming of the Protestant Dutch to Southern India in the year 1663, the Malabar Christians were delivered from the persecutions of their oppressors and regained their spiritual freedom and independence. But while the methods adopted by the Roman Church to win converts cannot be too severely condemned, it must be admitted that the missions established by Portuguese religious orders along the Malabar coast and in Southern Madras, and especially that which had its origin in the labours of Francis Xavier, of the Society of the Jesuits, opened the way for the spread of Christianity in India. Francis Xavier

arrived in India in the year 1542, and at the beginning of the seventeenth century the Jesuits opened another mission on the Madras coast. They penetrated into the interior and carried the knowledge of the Christian religion as far inland as Salem, Trichinopoli, and Madura and the distant region of Tinneveli. Whatever may be said of the Roman Church as an organization, and in particular of the Society of the Jesuits, it is beyond dispute that its emissaries in those early days showed great zeal and devotion—a devotion, indeed, that puts to shame some of the Protestant missions working in India to-day. Their priests and monks adopted Indian dress, and in all matters of daily life, such as food, etc., they followed the customs of the Indians among whom they laboured. Their success was, indeed, remarkable, both among high and low castes, and considerable sections of the people in many districts were converted to Christianity. It was largely a nominal Christianity, no doubt, but it familiarized the people with the doctrines of the Christian religion, and I think it would be incorrect to say that it left no permanent impression upon the people. One result, at least, may be attributed to it, and that is, the greater receptiveness of the people of South India as regards the preaching of the Gospel in later times. In the year 1881, according to the census of that year, out of a Protestant Christian population of 511,000 for the whole of India, over 280,000 were inhabitants of Southern India, while in the case of Roman Catholics the figures are even more striking. It is not unreasonable to conclude, therefore, that the Roman Catholic missions in South India had exercised an influence favourable to Christianity on the people among whom the missionaries lived which made itself felt when the Protestant missions began to work. But a Christianity that denied to the people the knowledge of the very Scriptures on which it was founded was bound to fail, and while Roman Catholicism may have gained many adherents from among Hindus and Muhammedans, their change of religion was accompanied by very little change in life and character. Its missions, indeed, had no perceptible share in bringing about the awakening that began in India two centuries later.

We can now see why it was that, between the arrival of the Portuguese in India and the end of the eighteenth century, European influence and contact with the Christianity of the west had produced no results of any importance. When the Mughal Empire was at its zenith, under Akbar the Great,

toleration was shown for every form of religion, and there was an open door for Christianity, had it been ready to enter. It is said that one of Akbar's wives was a Christian, and he gave directions that his son, Prince Murad, when a child, should take lessons in Christianity. Jehangir, too, his son and successor, was favourably disposed towards Christianity. We learn from the accounts of Sir Thomas Roe, King James I's ambassador to the Mughal Court, that two of Jehangir's nephews embraced Christianity with his full approbation. Nevertheless, no efforts were made by Christian missions, Catholic or other, to disseminate the Christian religion among the peoples of Northern India during the reigns of the Mughal emperors, and it was not till the beginning of the eighteenth century that the first Protestant mission made its appearance in India. This was the mission of the Lutherans, Ziegenbalg and Plutschau, who in 1705 began work at the Danish settlement of Tranquebar. Ziegenbalg and many of the early Lutheran missionaries were men of great ability, and Ziegenbalg began the translation of the Bible into Tamil, which his successor, Schultze, completed in 1725. Schultze also translated the whole of the Bible into Hindustani. About the middle of the century the well-known missions at Tinneveli, in the district of Tanjore, were founded by Schwartz, and Christianity continued to make progress through his labours. Education received much attention, and schools were set up in order that secular instruction might go hand-in-hand with instruction in the Christian faith. But the century was nearing its close before any of our own people heard the call to go and preach the Gospel in India, and then the call came to a humble cobbler, Carey by name, one of the earliest as well as one of the most honoured of the missionaries that have gone forth from these shores. Carey arrived in India in the year 1793. By that time the English had firmly established themselves in Bengal as the real, if not the nominal, rulers of the province. Clive's victories had defeated every challenge to their military supremacy, and the wise reforms he effected in the administration, combined with his reorganization of the East India Company's service during his second term of office as Governor of Bengal, 1765-67, laid the foundations of our rule in India. During the next twenty-five years the Company continued to extend and consolidate its power in Northern India and the Deccan. It carried its victorious arms across the peninsula to Bombay and Gujarat, and by the year 1793 Lord Cornwallis, the Governor-General

assisted by his allies, the Nizam of Haiderabad and the Mahrattas, was in a position to dictate terms of peace to Tipu Sultan, the Muhammadan ruler of the State of Mysore. Carey, on his arrival in Calcutta, found the door shut to missionary enterprise. During the early years of its history in Bengal the East India Company had not shown itself hostile to the labours of Protestant missions. It had allowed Kiernander, who had been sent out by the Danes, to begin a mission in Calcutta in 1758 ; but, subsequently, it reversed its policy towards missionaries, and not only put every obstacle in their way, but deported them back to England. As has often been observed, it was necessity that drove the Company to assume the position and duties of administrators. It had no desire to rule India, far less to reform the intellectual, social, and religious life of the people. It was compelled by force of circumstances to undertake first one and then another administrative duty, because it could not otherwise obtain that settled order and financial security without which profitable commerce was impossible. Carey thus found the purpose for which he had come to India thwarted by his own countrymen, and, baffled in his attempt to begin work as a missionary, he settled as an indigo planter near Malda in Northern Bengal. Here he studied Sanskrit and Bengali, and, having gained some knowledge of these languages, essayed the task of translating the Bible into Bengali. In 1799 he was ready to commence the work on which his heart was set, and, to avoid the opposition of the East India Company, he settled with Marshman and Ward and two other missionaries at Serampur, which at that time was a Danish possession. Thus began that wonderful literary activity that has made the little band of Serampur missionaries famous in every Christian land. In ten years the Bible was translated and printed, in whole or in part, in 31 languages, and by the year 1816 the mission had 700 converts. About the same time the London Missionary Society began to send out missionaries, and in the year 1813 the East India Company was compelled by its new charter to abandon its opposition to missions. It was becoming clear not only to the wiser men among the Company's administrators, but also to the Government at home, that missions, instead of being opposed, should be encouraged and used as a civilizing ally by the Government. If there was to be any real progress in education and social amelioration among the people of India, co-operation between the Government and

the missionaries was indispensable. But it must not be thought that the Government had any desire to foster the growth of Christianity among the people of India. On the contrary, they believed it to be necessary, for the stability of their position, not merely to recognize the religions of the people, but to support them as fully as the native rulers, whose successors they were, had done, and to protect their soldiers from any attempt to make them Christians. For it must be remembered that they had won their territory by means of an Indian army composed mainly of high-caste Hindus who observed all the rules of caste with great strictness, and it was their fixed policy to use every means to safeguard the loyalty of their troops. In pursuance of this policy they took under their management and patronage a large number of Hindu temples, and they even went so far as to refuse to employ native Christians in any capacity and to enforce all the rigours of Hindu law against them. Nevertheless, even in the early days of our rule, there was a measure of co-operation between the Government and the missions. When the College of Fort William was founded by Lord Wellesley in the year 1800 for the purpose of giving the young civilian officers a training in Indian languages and literature, Carey was the only man who could be found to teach Sanskrit and Bengali. He was accordingly appointed professor, and for many years, while his chief work was at Serampur, he spent one-half of each week in Calcutta, lecturing to young civilians in the morning and preaching to the poor in the evening.

This is not the place to discuss the Government's present policy of absolute religious neutrality which has been followed since the year 1858, when the Home Government became directly responsible for India, but I may be permitted to say that it is difficult to see what other attitude could have been adopted by the Government. Many individual officers of Government, unfortunately, have interpreted the policy as enjoining favour to the religions of the country and opposition to Christian work, and educated Indians must, at times, have wondered at such an attitude on the part of officers who professed to be Christians. Some people would have had the Government take a definite stand in favour of Christianity and use its money and influence for the propagation of Christianity. Such a course, as Dr. Farquhar observes in his book, *Modern Religious Movements in India*, to which I am indebted for much of my information, could have brought only disaster to the cause of Christ. The

Government could not with justice have used the revenues of the country for the promotion of a religion with which none of the peoples of the country had any sympathy. Nevertheless, I am inclined to think that the Government of India, as a Government professedly Christian, might, without abandoning or modifying its policy of absolute religious neutrality, have given Christian missions more encouragement and moral support. Provincial Governments in recent years, I am glad to say, have shown themselves more inclined to do this. For instance, grants-in-aid have been given to mission schools, and the work of reclaiming the Criminal Tribes that have, from time to time, caused the Governments of the United Provinces, Bombay, and the Panjab so much trouble has been largely entrusted to the Salvation Army, who have achieved remarkable results.

Another notable result of the new Charter granted to the East India Company in 1813, which put an end to its opposition to missions, was the establishment of the Bishopric of Calcutta and three archdeaconries, one for each Presidency. The first Bishop of Calcutta (Middleton) arrived in 1814, and since that time the Church of England has actively prosecuted missionary work in India, either through the Church Missionary Society or through the Society for the Propagation of the Gospel. Their most successful work has been carried on in Southern India, where they have reaped the fruits of the devoted labours of the Lutheran missionaries.

The missionary work of Carey and his colleagues at Serampur soon began to develop. The foundation of it was the preaching of the Gospel and the translation of the Scriptures, but by means of a printing press which Ward set up they were able to publish literature of many kinds and to enlist the aid of journalism for the dissemination of their teaching. They laid great stress on education and opened many schools around them for both boys and girls. It was not long before they began to realize that the most effective method of spreading the knowledge of the Gospel of Jesus Christ would be to send out native missionaries to preach throughout the country, and with that object in view they built a large college at Serampur and received authority from the King of Denmark to confer degrees. The college quickly attracted students, and, as a result of its teaching, knowledge of the Christian religion began to spread through Bengal. The work thus ably begun by Carey and his colleagues was continued by a young Scotch missionary named Alexander

Duff, who arrived in Calcutta in the year 1830. Believing that nothing would do so much to prepare the Hindu mind for the reception of Christian ideas and principles as intercourse with the spirit of the West through the medium of the English language, Duff opened a school in Calcutta for the teaching of English. Two convictions led him to adopt this method. The first was that the highest form of education is Christian education, by which he meant a sound intellectual and scientific training based on the moral and religious principles of Christ. His second conviction was that such an education could be given to the Hindu only through the medium of English because their own vernaculars did not contain the books necessary for it. Raja Ram Mohan Ray, of whom we shall be speaking presently, obtained rooms for him in which to start his school and brought him some of his earliest pupils. His work in a few years opened a wide door to missionary enterprise in India. His school became extraordinarily popular; the young men of the city flocked to him, and the results of his teaching were remarkable. Western thought caused a great ferment in the minds of the students, breaking down their old ideas and undermining their old faith; while the daily lessons in the Scriptures brought them a new vision of spiritual truth. Many of them, fired with enthusiasm for the new life thus revealed to them, renounced Hinduism and embraced Christianity, and Duff's work and Christianity became the most absorbing topic of conversation among the Hindu community. Dr. John Wilson started similar work in Bombay and John Anderson in Madras. Their example was quickly followed by missionaries in other parts of the country.

To the spiritual awakening of India that thus began at the commencement of the nineteenth century no man contributed more than Raja Ram Mohan Ray, the founder of the Brahma Samaj, a Society whose object was to purge Hinduism of idolatry and the evil practices connected with it and restore it to its primitive purity. I do not think it would be too much to say that it was this remarkable man who first opened the eyes of his fellow-countrymen in Bengal to the truth of the Bible as the revelation of God to man in His Son Jesus Christ, and though he remained a Hindu to the end of his life, as would appear from the fact that, after his death, the sacred thread of his caste was found round him, he was "not far from the Kingdom of God." It was his influence, indeed, and the influence of his

writings, that caused the work and teaching of Alexander Duff to be followed at once by such extraordinary results as we have noted ; and in order to help to an understanding of the extent and power of that influence, it will be well to give a brief sketch of his life and character up to the point at which, in the year 1830, a few months after Alexander Duff's arrival, he left India for England, never to return.

Ram Mohan Ray was born in the year 1774, the son of a Brahman, and at the early age of 15 his mind had so revolted against the idolatry of Hinduism, with its meaningless and often disgusting rites and ceremonies, that he determined to leave his father's roof and sojourn for a time in Tibet, if haply he might find there a purer and more satisfying form of religious faith. He spent two or three years in that country in intercourse with the priests of the Lama, and, on his return to his paternal home at Burdwan, devoted himself to the study of Sanskrit and the ancient books of the Hindus. He had frequent discussions with his father, but through awe of him never avowed the scepticism he felt as to the existing forms of their religion. At the age of 22 he commenced the study of the English language, and when, a few years after his father's death in 1804 or 1805, he became the possessor of the whole of the family property through the death of his brothers, he definitely formed plans to reform the religion of his countrymen. He must have spent large sums of money in his efforts to enlighten them, for he gratuitously distributed most of the works which he published for the purpose. He quitted Burdwan and removed to Murshidabad, where he published in Persian, with an Arabic preface, a work entitled *Against the Idolatry of All Religions*. No one took up the challenge thrown down, but the book raised up a host of enemies against him, and in 1814 he retired to Calcutta. There he continued his studies and gradually gathered round him intelligent Hindus who were interested in his investigations and some of whom united with him in the year 1818 in a species of monotheistic worship. In the year 1816 he had published an English translation of an abridgment of the "Vedant," which is an abstract drawn up by Vyas 2,000 years ago of the whole body of Hindu theology as contained in the Vedas. In his preface to this translation he wrote as follows :—" My constant reflections on the inconvenient, or rather injurious, rites introduced by the peculiar practice of Hindu idolatry, which more than any other pagan worship destroys the texture

of society—together with compassion for my countrymen—have compelled me to use every effort to awaken them from their dream of error, and, by making them acquainted with their Scriptures, enable them to contemplate with true devotion the unity and omnipresence of Nature's God. By taking the path which conscience and sincerity direct, I, born a Brahman, have exposed myself to the complainings and reproaches even of some of my relations, whose prejudices are strong and whose temporal advantage depends on the present system. But these, however accumulated, I can tranquilly bear, trusting that a day will arrive when my humble endeavours will be viewed with justice—perhaps acknowledged with gratitude. At any rate, whatever men may say, I cannot be deprived of this consolation—my motives are acceptable to that Being who beholds in secret and compensates openly." A reprint of this abridgment of the "Vedant" was published in London in 1817 by a friend of his, and the preface to it contains a letter from Ram Mohan Ray to this friend in which occurs the following significant passage: "The consequence of my long and uninterrupted researches into religious truth has been that I have found the doctrines of Christ more conducive to moral principles than any other which have come to my knowledge, and I have also found Hindus in general more superstitious and miserable, both in performance of their religious rites and in their domestic concerns, than the rest of the known nations of the earth."

Ram Mohan Ray's writings show that he was greatly perplexed by the various doctrines which he found insisted upon as essential to Christianity, both in the writings of Christian authors and in his conversations with the Christian teachers with whom he was intimate. He resolved, therefore, to study the original Scriptures for himself, and for this purpose he acquired a knowledge of the Hebrew and Greek languages. Becoming strongly impressed with the excellence and importance of the Christian system of morality, he published, in 1820, in English, Sanskrit, and Bengali a series of selections principally from the Synoptic Gospels which he entitled "The Precepts of Jesus, the Guide to Peace and Happiness." This work was published anonymously, but without any attempt to conceal the identity of the author, and it brought upon him some severe animadversions in *The Friend of India* (the modern *Statesman*). In reply to them, Ram Mohan Ray published over the signature "A Friend to

Truth" an appeal to the Christian public in defence of "The Precepts of Jesus," in which he declared that the expressions employed in the preface to them should have shown his opponent that "the compiler believed not only in one God whose Nature and Essence is beyond human comprehension, but in the truths revealed in the Christian system." He further maintained that the "Precepts of Jesus" contained not only the essence of all that is necessary to instruct mankind in their civil duties, but also the best and only means of obtaining forgiveness of sins, the favour of God, and strength to overcome our passions and to keep His commandments.

This appeal and a second appeal which followed it drew a series of criticisms from Dr. Marshman, of Serampur, and Ram Mohan Ray once again restated his beliefs, and concluded by saying: "Had not experience too clearly proved that such metaphorical expressions (*i.e.* those relating to the unity of God the Father and God the Son), when taken singly and without attention to their contexts, may be made the foundation of doctrines quite at variance with the tenor of the rest of the Scriptures, I should have had no hesitation in submitting indiscriminately the whole of the New Testament doctrines to my fellow-countrymen, as I should have felt no apprehension that even the most ignorant of them, if left to the guidance of their own unprejudiced views of the matter, could misconceive the clear and distinct assertions they everywhere contain of the unity of God and the subordinate nature of His Messenger Jesus Christ."

The purpose of these quotations from Ram Mohan Ray's writings is to show how deeply he had been impressed with the truth and purity of the Christian faith; and to prove that he was ever ready to give a practical application to his beliefs, I should add that during those years he conducted a vigorous agitation against the practice of "sati" (that is, the self-immolation of a Hindu widow on the funeral pyre of her husband), which finally led to Lord Bentinck's famous order of the 4th December, 1829, declaring all who abetted "sati" to be guilty of culpable homicide.

The following extract from an article written by the celebrated Swiss historian, Sismondi, in the *Revue Encyclopédique* in the year 1824, will help you to appreciate the extent of the influence exercised by Ram Mohan Ray and the extraordinary hold he had on the minds of his countrymen. Sismondi wrote: "A glorious reform has, however, begun among the Hindus. A

Brahman, whom those who know India agree in representing as one of the most virtuous and enlightened of men, Ram Mohan Ray, is exerting himself to restore his countrymen to the worship of the true God and to the union of morality and religion. . . . He communicates to the Hindus all the progress that thought has made among the Europeans. He is among them, by a much juster title than the missionaries, the Apostle of Christianity.”

I have referred at what may seem disproportionate length to the work and influence of this one man—Ram Mohan Ray—because while the missionaries Carey, Marshman, and Ward, and their predecessors, the Lutherans, had opened the door for the propagation of the Gospel in Bengal and Madras, it was Ram Mohan Ray who, by his writings and example, began that great awakening in the minds of his fellow-countrymen which was to develop so rapidly and which, by the very contrast to the purity and truth of the Christian Faith, brought them face to face with the debasement and pollution of much in Hinduism that flourished under the guise of religion. Ram Mohan Ray’s appeal to the educated classes among his countrymen, and especially those of the Brahman caste, was one of extraordinary power. It was utterly devoid of self-interest or self-seeking ; he himself was in affluent circumstances and possessed almost everything that birth or position could give him. What he sought was Truth and Truth alone, and shall we be far from the truth if we say that some rays of “ the glory of God as revealed in Jesus Christ ” had entered his mind and heart and brought the conviction that in Jesus Christ, His Anointed One, God had made Himself known to men ? It was his work which prepared the way for the teaching of Alexander Duff and, as we have seen, made the minds of his countrymen peculiarly receptive of the truths of the Gospel.

Contemporaneously with the reforming activities of Ram Mohan Ray, a new spirit began to inform the Indian Government. The conviction had been growing in the minds of the wisest statesmen at home that Britain, if she was to govern India, must govern it for India’s good, and at the beginning of Lord Bentinck’s Governor-Generalship a policy of reform was initiated that not only brought about the abolition of many cruel and revolting practices which had long formed part of the religious life of the people, but gave effect to the cardinal principle that no native of India should suffer in any way because of his religious opinions, but all should be absolutely equal before the

law. "Sati," as we have seen, was prohibited, and effective measures were set on foot for the suppression of "thagi" (the throttling and robbery of travellers), female infanticide, and human sacrifice. At the same time, though it was principally the need for economy that led to the introduction of this reform, the employment of Indians in Government service was largely extended and the foundation laid for the formation of a Provincial Civil Service.

More momentous and far-reaching in its consequences than any of these reforms, though less spectacular, was the decree, issued in 1835, shortly before the expiration of Lord William Bentinck's term of office, that English should be the official language of India and the medium of instruction in all higher education. For years there had been an acute controversy among the officials of Government as to whether the Government should support Western or Oriental education, and Raja Ram Mohan Ray took part in it, condemning the Sanskrit system of education as useless and arguing strongly in favour of education on the lines of Western science and thought. The controversy came to a head in connection with a question as to the distribution of educational grants from the public purse, and the scale was turned in favour of a Western education and English as the medium of instruction by Macaulay's famous minute, in which he argued powerfully in favour of English as the language which gives the key to all true knowledge. Paradoxical as the statement may at first seem, the decision that higher education in India should be along the lines of Western science and thought and that English should be the medium of instruction has been one of the most potent factors in bringing the life and thought of the literate classes of India, and thus, indirectly, Indian politics, under the influence of Christianity. It is to be remembered, of course, that Christianity has exercised its greatest influence on the politics of India through the Administration, which, since the British became possessors of the country, has been regulated and conducted in accordance with the principles that underlie the governments of all professedly Christian countries. But the consideration of this aspect of the subject lies outside the scope of the present paper, and I am attempting only to show the part that Christianity has played in shaping and giving direction to Indian politics through its influence on the life and thought of the peoples of the country. How, then, has the decision to make English the official language and the

medium of instruction in all higher education affected the life and thought of the people of India, or, to put it more exactly, the literate classes among the people? To give the answer in a single sentence, it was by opening to the Indian mind the whole field of English literature and science, with its Christian ideals of liberty, equality, and philanthropy. It will, perhaps, help us to realize the effect of this policy if we try to imagine what would have been the mental condition and position of the Indian peoples to-day, had the door to a knowledge and understanding of Western science and thought been shut to them (excepting a very small and limited class) and English had never become a medium of thought and speech among them. We have only to read Macaulay's great minute of 1835 to see what would have been the result of adhering to a vernacular education for the people. He scathingly criticizes the Oriental instruction given in the existing colleges and remarks: "Our Council is obliged to print books which give artificial encouragement to absurd science, absurd metaphysics, absurd physics, and absurd theology." Apart from the teaching of the missionaries among the poorer classes and the distribution of the Scriptures in the vernaculars, the light of Christian Truth would never have shone upon the people, and the darkness that enshrouded them at the middle of the eighteenth century might have remained to this day. To trace the development and spread of English education in India and to show how students at the schools and colleges became imbued, through the prescribed educational courses, with Western thought and ideals would require a volume, but I shall endeavour to explain very briefly in what forms the influence thus imparted manifested itself, and how it helped to shape the hopes and aspirations of the politically-minded classes. The results produced so far have been revolutionary in the highest degree, and the changes that are even now in progress are kaleidoscopic. What the ultimate result will be, it is impossible to predict.

The society known as the Brahma Samaj, which Ram Mohan Ray had founded in the year 1828 with the object of purging Hinduism of polytheism and idolatry, languished after he left India for England and would have died had not the Tagore family, now so well-known through the writings of Rabindra Nath Tagore, become interested in the new movement and given it both moral and financial support. In 1842 Debendra Nath Tagore, the son of Ram Mohan Ray's friend, joined the

Society, and was soon recognized as its leader. Under his leadership it continued to develop, and though its advance towards Christianity was checked in that the new leader did not share Ram Mohan Ray's reverence for Christ and believed that India had no need of Christianity, its influence steadily increased during the next twenty years. Meanwhile, in the year 1854, the duties of Government in regard to the education of the Indian people were reaffirmed in the comprehensive despatch sent out to the Governor-General by the Court of Directors at the instance of Sir Charles Wood (afterwards Lord Halifax), President of the Board of Control. Universities were founded at Calcutta, Madras, and Bombay in the year of the Mutiny, and in addition to other reforms, schools for teaching English were gradually established in every district. At the same time, Christian missions began to give greater attention to education, especially English education, in their schools, and the number of missionaries rapidly increased.

A few years after the Mutiny the Brahma Samaj again took a prominent place in the social and religious life of Bengal under the leadership of one Keshab Chandra Sen, a Calcutta student who came of a well-known Vishnuite family and had had a good English education. He founded the "Sangal-Sabhā," or Association of Believers, which met regularly for devotional purposes and for the discussion of social and religious questions. The Sabhā also discussed the question of caste, with the result that the members gave it up once and for all, while Debendra Nath Tagore even went as far as to discard his sacred thread. At Keshab Chandra Sen's suggestion the Brahma Samaj began to follow the example of Christian philanthropy and gathered money and food for sufferers from famine. Keshab came more and more under the influence of Christ and sought increasingly to translate His precepts into the daily practice of his life. In the year 1864 he made a long tour in India, extending as far as Madras and Bombay, and preached with great power and success wherever he went. The welcome he received throughout his tour was remarkable, and the doctrines he preached met with such acceptance that he conceived the idea of forming one Brahma Samaj for the whole of India. As a result of his preaching, a new society called the "Veda Samaj" was founded in Madras the same year, which subsequently developed into the present Brahma Samaj of Madras; while three years later his preaching bore further fruit in the formation in Bombay

of a society called the "Prārthanā Samāj" or Prayer Society. The aims of this society were theistic worship and social reform. The movement, however, did not spread widely in Bombay. It lacked the active and enthusiastic missionaries that laboured for the Brahma Samaj in Bengal, and owing to the absence of definite beliefs among its members and the uncertainty of its theological position, it did not produce much literature.

After his return to Calcutta Keshab Chandra Sen read a great deal of Christian literature and was more and more influenced by the Christian Scriptures. He gathered round himself a small but devoted band of followers who were characterized by a desire to lead a pure and holy life and by a passion for the saving of souls. They went about preaching and lived lives of simplicity and self-sacrifice. In 1866 Keshab Sen formed a new society, called the "Brāhma Samāj of India," and invited all Brahmas throughout the country to join it. Many of the oldest members of the original society refused to join it, but nearly all the younger and more enthusiastic men followed Keshab, and many notable Brahmas in other parts of the country also joined the new society. In 1869-70 Keshab Sen paid a visit to England, where he was warmly welcomed, and on his return, with his mind filled with fresh schemes for social reform, he inaugurated many new social activities, including a Normal School for Girls and an Industrial School for Boys. A fresh impetus was given to the movement, and the tours of the Samāj missionaries in the towns and villages of the country and Keshab's own journeys to distant cities and his great lectures in English drew multitudes of men to the worship of the one true God and rapidly built up the membership of the Samāj. Yet already there were signs of discord within the Samāj, and an opposition party began to make itself heard. The Samāj had no organization, and Keshab, induced by the reverence and homage which the younger members paid him to believe that he was different from other men and in some way inspired, resisted every form of popular government proposed by those members who were sensible of the dangers that were likely to arise from the supremacy of one man in the Samāj. The opposition of the party of freedom and progress grew and finally came to a head when Keshab Chandra Sen permitted his daughter to be married to the young heir to the native state of Kuch-Bihar, and the marriage was celebrated with idolatrous rites and ceremonies. The marriage was denounced by the opposition party as an

unforgivable sacrifice of principle, and the majority of the members, failing to depose Keshab, left the Samāj and formed a new society called the "Sādhāran Brahma Samāj." "Sādhāran" means "general," and the addition of the word to the title implied that it was catholic and democratic. Despite this great schism in its ranks, however, Brahmaisim has continued to grow in strength, and to-day the "Sādhāran Brahma Samāj" has a large body of adherents in Calcutta. Its influence, indeed, was very much wider than the number of its adherents suggested. It is no exaggeration to say that the ideas and principles underlying Brahmaisim and other similar movements in India have permeated, in a greater or less degree, every grade of society among the educated classes of India, and that, to-day, very few educated Hindus could be found to defend the superstitious and idolatrous practices that form so large a part of Hinduism. During the latter part of my service in Bengal one of the most striking characteristics of the younger generation of Bengalis was its acceptance of the duty of social service. If a flood or other catastrophe occurred, there were always bands of young men ready to endure hardship for the relief of the sufferers, and on more than one occasion their assistance proved of great value to the Government. The spirit of self-sacrifice thus manifested was undoubtedly due partly to the example of the Christian missionaries and partly to the influence of the Brāhma Samāj and its unceasing insistence, from its earliest days, on the virtues of philanthropy and service for the common good.

I should remark here that the awakening which began to manifest itself in India at the beginning of the nineteenth century had very little effect on the Muhammadan section of the population. Whether it was due to resentment at the destruction of their empire in India by the English or to a contempt for mere intellectual power, the Muhammadans as a whole displayed an almost complete indifference to the advantages offered by the new system of education, and the new movements that had so marked an influence on the social and moral ideas of the Hindus touched them but little. Sir Syed Ahmad Khan, the founder of the Anglo-Muhammadan College at Aligarh, was an outstanding exception to this rule, and it has been largely due to his labours in the cause of reform that the Muhammadan community in India to-day is gradually becoming permeated with modern ideas in religion.

At the time when the religious zeal of Keshab Chandra Sen and his followers was gaining many adherents for the Brāhma Samāj, the missionary societies in India began to display increased activity. Education on Christian lines was advanced, translations of the Scriptures into the vernaculars were widely disseminated, and much was done to improve the conditions under which native Christians were living. The progress of Christianity between the years 1872 and 1901 was indeed remarkable. It nearly doubled its numbers in the thirty years, rising from one and a-half to about three millions. Native Christians, however, as was but natural, were most largely recruited from among the classes outside the Hindu system, that is, the outcastes or depressed classes, and from the nature of the case they were not in a position to exercise any appreciable influence on Indian politics. It is only within the last few years that the position of the 60 millions of outcastes or untouchables in the State has become a question of pressing importance.

Some time before the death of Keshab Chandra Sen the reforming, not to say iconoclastic, tendencies of the new movements to which the religious awakening in India had given rise had begun to produce a reaction among the educated classes of India. A new spirit was seen to animate them. Many forms of new effort, especially in the direction of social service, appeared, and a National Reform Movement was initiated which led to the formation in the year 1888 of a National Social Conference. The reaction manifested itself most conspicuously in a growing desire to defend Hinduism and an increasing confidence in its defensibility. The movement is now shared by Muhammadans, Buddhists, and Parsees, but it first appeared among the Hindus. Concurrently, political aspirations began to make themselves heard, and in the year 1885 the Indian National Congress was inaugurated. On the religious side the reaction led to the inception of many new movements, prominent among which was the Arya Samāj, founded by Dayanandra Saraswati, and the Deva Samāj, an atheistic society with its centre at Lahore in the Panjab. These all had their birth in a desire to free the ancient religions of the people from the gross and polytheistic ideas that had grown around them and to bring them more into conformity with the moral principles underlying Christianity.

The new spirit of self-confidence and independence which was now animating the educated classes and quickly developed

into a spirit of Nationalism soon began to manifest impatience at the slow progress that was being made towards emancipation from the control of the foreigner. The educated Indian regarded himself as a full-grown man and was becoming restless under the domination of a race whose attitude toward him, unfortunately, was too often calculated to inspire him with a sense of inferiority. Impatience bred resentment, and at the close of the nineteenth century a deep feeling of hostility towards their English rulers began to surge through the minds of the educated youth of India. This feeling was accentuated by the fact that, owing to the low educational standards set by Government, thousands of young students were passing the matriculation or B.A. examination, for but a small fraction of whom posts could be found in Government service, and the rest of whom were wholly unfitted by training for scientific or commercial pursuits. The victory of Japan in the Russo-Japanese War caused their hostility to leap into flame, and in 1905 a campaign of anarchism and murder was set on foot which compelled the Government to adopt severe repressive measures. The phase passed, but the spirit of animosity remained, and year by year the demands of that section of the educated classes which was represented by the Indian National Congress for self-government, grew more and more insistent. During the Great War, which set free a tide of nationalism through the whole world and led to the creation of many new and independent States, the spirit of antagonism to English rule burst out afresh. Mr. Gandhi placed himself at the head of the opposition that had been aroused by the passing of the "Rowlatt Bills" and, in 1918, began a campaign of passive resistance to Government. It ended in disaster, but the non-co-operation movement steadily grew. The Indian National Congress lent it support, non-co-operation committees were set up in the villages, and Mr. Gandhi went up and down the country preaching opposition to Government. To-day the effects of the movement are still being felt in India, and even at the present moment, when the Round Table Conference is sitting and determined efforts are being made to evolve a constitution for India that shall satisfy, in part at least, if not wholly, the aspirations of educated Indians while safeguarding the interests of the inarticulate masses, non-co-operation is still being advocated, and within the last few months we have witnessed a fresh outbreak of anarchism and murder.

Despite the general turmoil and unrest, however, and the persistence of the Swarajist or Extremist party in its campaign to coerce the Government by terrorism and open defiance of the law, the leaven of Christian ideals and principles is still working, and the outlook of the educated classes in regard not only to matters of religion, but also to political questions affecting the welfare of the people, is being gradually transformed. The revival of the ancient religions, while it has led to the repudiation of many of the beliefs and customs that were founded on them, has at the same time revealed their utter insufficiency to meet man's deepest need. Thinking Hindus no longer hold the doctrine which is the basis of the Hindu religious system, namely, that each man's caste is a certain index of the stage of spiritual progress his soul has reached in its transmigrational journey. To an extent they are unwilling to admit, they have lost faith in the system, and, finding nothing to take its place, have sought satisfaction for their aspirations in social service and philanthropic schemes for the betterment of the people. Many, again, have turned to politics in the false hope that, if they could but have freedom to govern themselves, it would usher in a golden era and provide a cure for all the ills from which the country is suffering. But beneath all the changes that are rapidly transforming the social and political life of India, Christianity has been working like an unseen force. In every modern reform movement Christian standards have been the guide, and the methods and principles of Christian missions have been followed in almost every case. The movements for the emancipation of the depressed classes, for the deliverance of women from the bondage of the "purda," and for the abolition of caste owe their inception to the influence of Christianity, and it is by the adoption of Christianity that the depressed classes hope to secure for themselves a position of freedom and equality in the social system of India. What will be the outcome of these movements no man can foretell, but that Christianity will continue its beneficent work is certain, for, in the words of Sir Narayan Chandravarkar, of Bombay, "The ideas that lie at the heart of the Gospel of Christ are slowly but surely permeating every part of Hindu society and modifying every phase of Hindu thought."

DISCUSSION.

The CHAIRMAN (Mr. E. A. Molony, C.B.E.), in moving a vote of thanks to the lecturer, said: As we are chiefly interested with the events which have led up to the present position, I do not propose to refer to ancient history except to mention the very early Christian tradition that St. Thomas, after preaching in the kingdom of one Gundaphar in India, went on into another kingdom, where he was martyred. Quite recently it has been shown that Gundaphar was an Indo-Parthian prince, who probably ruled in North-western India.

The present condition of affairs in India may be said to have been derived from the evangelical movement in England under Wesley, at the end of the 18th century. Carey was the great pioneer missionary, and the early 19th century was a period of great events. The life of Ram Mohan Ray, the new charter of the East India Company giving a footing to missionary work, social reform under Lord William Bentinck, the inauguration of the Brahma Samaj, and the facilities for English education—all these were signs as well as the cause of a great liberation of thought from age-long shackles. The process which we see proceeding is a veritable renaissance of India as well as of nearly the whole of Asia.

The reader of the paper has referred to the new portent of social service which he came across in Bengal. I also came across it at Agra in the year of the great influenza epidemic, when the local Seva Samiti (Society of Service) did most excellent work, and this new spirit is at work all over India. The Servants of India Society, which started in the Bombay Presidency, is well known, and the spirit of social service is now spread all over the country, and will before long bring in many much-needed reforms. This movement is mostly due to the new ferment of Western scientific ideas and the teaching and example of missionaries.

The victory of Japan over Russia gave an immense impulse to the feeling of nationality in India, as elsewhere in Asia—a feeling which was further reinforced by the return of Indian soldiers who had served in Europe and elsewhere during the Great War, and from the loudly proclaimed slogans of self-determination and the right of small nations to exist.

New ideas and new ideals now have a wonderful opportunity to establish themselves, and the extent to which Christian ideas have penetrated into the citadels of the old religions is astonishing. Those who have read *Christ at the Round Table* will realize something of what is happening. The feminist movement, which 30 years ago or less was really non-existent, is now vigorous.

In the mass-movement areas great and even embarrassing numbers are coming into the Christian Church, and when the vision of an independent Indian Church, purged from the divisions of the West, takes hold of the popular mind, a veritable landslide is not improbable. The Salvation Army is working among outcastes. The Government has for many years given money for the reform of the Maghya Doms, with no result. The Salvationists are successful inasmuch as they introduce new life into the men they try to reform. Similarly, I think, the salvation of India will be brought about by the introduction of new life through Christ.

The vote of thanks was carried with acclamation.

The Rev. A. BODY said : What we see in India now is new wine being poured into old wineskins ; and the wineskins are bursting. That makes things very difficult for those who are responsible for the peace and order of the land. But it is a sign of success, and not of failure. The new wine is in the old skins, and it is working there.

Why should we go on giving Western teaching to the Indians ? They can never become Westerns, and they only get muddled. The answer is that we can only give them what we have to give. That Western civilization we have to give, and we have tried to give that and have succeeded. We used in missionary work to try and Anglicize the people, until the Mutiny, and then we learned that we ought to Christianize them and not to anglicize them. That was a great and very important lesson—the characteristic note of our Mission work—and we owe it to India to act on the lesson so learnt.

Lieut.-Col. MOLONY warmly thanked the lecturer for a paper so sympathetic to Christian Missions in India ; but he thought that the Mahrattas were more to blame than the British for the destruction of the Moghul Empire. The point was of some importance, because Indians try to blame us for the wars which desolated India during

the century ending in 1818. These wars, however, were more due to the Mahrattas having cut the Moghul Empire in two than to any action on our part.

The Colonel read an extract from Mr. Rice Holmes' *History of the Mutiny* (which comes in the middle of a paragraph intended to describe the anarchy which it brought to the North-Western Provinces). This was the passage: "Those natives who had been taught English were generally, and those who had been converted to Christianity were invariably, loyal."

Mr. WILLIAM C. EDWARDS said: I am sorry that I cannot share in the optimism of the lecturer. I think that we have been going backward in India during the past generation. In my opinion our Government ought to have declared itself definitely and openly Christian in 1857, after the Mutiny.

Sir Herbert Edwardes said in 1860: "I have been asked (by men high in power, etc.) and I have unhesitatingly expressed it as my opinion that we ought to stand forth in India as a Christian Government. If asked why? I have said because I consider it our duty to do so. If asked whether a Christian Government of India is a course that is likely to be safe for England, the only answer which I should give to that question is that it is the ONLY safe policy" (*Life*, vol. 2, pp. 246, 247).

Alas, the policy of cowardice and compromise was adopted, and it has brought in its train unmeasured troubles. Our double-minded policy has been reflected in the officials sent to that country. The religious systems of India seem to me to be of Satanic origin. Our lecturer praises the great and wonderful schools of India, but do they turn out Christians? or *Anti-Christians*? Generally the latter. If we had established elementary *Christian* schools in the 740,000 villages of India, what a different story we might have to tell?

We have 80 million Muhammadans in India. I have been travelling in the East, and I believe that the Muhammadan religion is decaying fast. A few weeks ago I was speaking with a man in Damascus. He told me that he went to a certain college founded by Christian men and built with Christian money. He was not a Christian, but he had some belief in the Bible. He was taught Darwinism; he accepted that and rejected the Bible. He is now

a militant atheist. I hope the lecturer will forgive me for saying that I do not like people speaking of William Carey as "a humble cobbler." He was a learned man and a highly respected minister before he went out as a missionary to India. I have walked the great and noble halls of Serampur—stood in his pulpit and spoken in the Lal Bazaar, and I admire him greatly. We do not speak of Joseph Lancaster as a cobbler nor of Epictetus as a slave.

As regards Chandra Sen, he tried to graft upon the Hindu upas-tree some buds of Christian truth, in hopes of getting blossoms of Christian virtues. Consider for a moment his travesty of the Lord's Supper. He used rice instead of bread, and said, "We worship not thee, O Rice, but GOD IN thee." He was really an eloquent Pantheist, and Hinduism has much of that. I am equally opposed to the praises showered upon the Samaj movement. I have before me their pledges—judge for yourselves from two of them: "I shall, as the first step, amalgamate different branches of the same caste." Does not that mean the possible perpetuation of the MAIN castes? Again, "I will never hold, attend, or pay for nautches, or otherwise hold out encouragement to prostitution." That really means toleration of the "unspeakables" of Indian life and Hinduism.

I grieve to take so gloomy a view of Gospel work in India, and to have to say that, in my humble opinion, we are drifting toward a widespread apostasy among the so-called Christians there. Nothing is contributing so much to that as the teaching of Modernism in the colleges and pulpits that are financially supported by the self-denial of evangelical people in this country.

LECTURER'S REPLY.

During the discussion very little has been said by way of criticism, and I do not think there is much that calls for a reply on my part. The Chairman, I was glad to find, expressed himself as being in general agreement with the views put forward in the paper, and it is interesting to note that his own experiences in India lend support to the suggestion that the spirit of social service which has been seen to animate the younger generation among the educated classes of India during recent years is traceable to the influence of Christian ideals and the example of Christian missionaries.

Col. Molony has expressed dissent from the view that it was the British who destroyed the Moghul Empire. When referring to the Muhammadans' reluctance to avail themselves of the advantages offered by the new system of education, I was not discussing historical facts, but was indicating what influences might have been at work in the minds of the Muhammadans. The Mahrattas, undoubtedly, were an important factor in the weakening and destruction of the Moghul Empire, but it was the British who gave it the *coup de grâce*, and as they succeeded to that empire, it is not unnatural that the Muhammadans should lay its destruction at their door.

There is considerable truth, I think, in Mr. Body's remark that what we have been doing in India is to pour new wine into old bottles—with the inevitable result. But what lies at the root of the difficulties that are confronting us as a nation in India is that while we have largely destroyed the faith of the Indians in their ancient religions, we have given them nothing in their place, and have refrained from presenting Christianity to them as the one true religion.

Mr. Edwards has, I fear, misjudged or misinterpreted some of the remarks that have been made in presenting the subject for consideration. I greatly sympathize with his view that our Government should have definitely declared itself Christian after the Indian Mutiny—or even earlier than that—but I am unable to see that it could have given effect to such a declaration in the various branches of the administration or have discriminated in favour of followers of the Christian religion.

Mr. Edwards is mistaken in thinking that I have praised “the great and wonderful schools of India.” Far from it: in my opinion, the Government of India's educational system is one of the weak spots—if not the weakest—in the administration. Much more should have been done to spread and encourage primary education. Nor, again, is it quite correct to say that I have showered praises upon the Samaj movement. I have referred to the growth and development of the Samaj movement as showing that the leaven of Christian principles and ideals was working in the minds of thoughtful Indians, who sincerely desired that Hinduism might be purged of its corrupt and debasing beliefs, but I have not held it up for admiration, as Mr. Edwards seems to suggest.

743RD ORDINARY GENERAL MEETING,

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL,
WESTMINSTER, S.W.1, ON MONDAY, FEBRUARY 16TH, 1931,
AT 4.30 P.M.

DR. JAMES W. THIRTLE, M.R.A.S., IN THE CHAIR.

The Minutes of the last Meeting were read, confirmed, and signed and the HON. SECRETARY announced the election of the following:— J. H. Clifford Johnstone, Esq., as a Member, from Associate; and as Associates the Rev. H. E. Anderson, F.R.G.S., the Rev. J. H. J. Barker, M.Sc., the Rev. Arthur E. Hughes, M.A., and Colonel F. C. Molesworth.

The CHAIRMAN announced that a memorial in the form of a paper, read annually, had been instituted by the relatives of the late Dr. A. T. Schofield, and Dr. Knight's paper had been selected as the first of the series. He then called upon Dr. James Knight to read his paper on "Demon Possession; Scriptural and Modern."

Dr. A. T. Schofield Memorial Paper.

DEMON-POSSESSION: SCRIPTURAL AND MODERN.

JAMES KNIGHT, J.P., M.A., D.Sc., F.R.S.E., F.R.A.S.,
F.G.S.; Hon. Librarian, Royal Philosophical Society of
Glasgow; Hon. Librarian, Glasgow Society for Psychical
research; Lecturer in Science, Bible Training Institute.

SYNOPSIS.

Neglect of metapsychical studies—Science ought to deal with *all* phenomena—modern movement away from materialism—inter-action of mind and body. Constitution of man—his central position—his relation to spirit—universal belief in spirits—the universe spiritual at basis—classes of spirits—angels and their ministry—hierarchy of evil—the devil—demons in New Testament—varieties of demon-activity—witchcraft in seventeenth century—testing spirits. Characteristics of demon-possession in New Testament—in history—typical cases in modern times—obsession and possession—observations of demon-possession in China—demons *v.* spirits of the dead. Suggested explanations: delusion—imposture—odie

force—Boirac's classification of metapsychic phenomena—spiritoid phenomena—pathological explanations—demon-possession distinguished from disease—epilepsy and hysteria—warnings by psychiatrists—psychological explanations unsatisfactory—modern cases exactly comparable with Scripture cases—demon-possession and paranoia—spiritualism as a religion.

THE first object of the Victoria Institute is declared to be the full and impartial investigation, more especially of those questions of Philosophy and Science that bear upon the great truths revealed in Holy Scripture, and particularly with the view of reconciling any apparent discrepancies between Christianity and Science. My specific theme on this occasion is one which belongs to a neglected corner of the scientific field, neglected in spite of vigorous protests during more than half a century, that portion of the field which deals with what are now generally called metapsychical phenomena.

In his presidential address to the Society for Psychical Research in 1882, Professor Henry Sidgwick, referring to such phenomena, said: "We are all agreed that the present state of things is a scandal to the enlightened age in which we live. That the dispute as to the reality of these marvellous phenomena—of which it is quite impossible to exaggerate the scientific importance if only a tenth part of what has been alleged by generally credible witnesses could be shown to be true—I say it is a scandal that the dispute as to the reality of these phenomena should still be going on, that so many competent witnesses have declared their belief in them, that so many others should be profoundly interested in having the question determined, and yet that the educated world, as a body, should still be simply in the attitude of incredulity." The scandal still persists, though not to the same extent, and, indeed, is prevalent now only among those inveterate foes of all innovations, the half-educated classes, whose training has taken the form of instruction rather than of education properly so called. The really educated man has an open mind: *Homo sum, et nihil humani a me alienum puto*. The uneducated man has a closed or, at least, an undeveloped mind but an open mouth. There is no superstition too gross, no theory too fantastic, to be swallowed by the man who is deficient in trained and organized common-sense—Huxley's well-known definition of science. The half-educated person, on the other hand, holds the door of his mind ajar, and very often displays through the gap nothing but a cynical nose and a pair of suspicious eyes, the expression of that in-

vincible ignorance against which, we are told, the very gods fight in vain. Now science deals with phenomena, with *all* phenomena, without exception. It is refreshing to return to Huxley. "Nature means neither more nor less than that which is; the sum of phenomena presented to our experience; the totality of events, past, present and to come. Every event must be taken to be a part of nature, until proof to the contrary is supplied. And such proof is, from the nature of the case, impossible" (Hume, *Eng. Men of Letters*, p. 131). Now among these phenomena, by no means rare, come "certain feelings, acts and experiences of individual men in their solitude, so far as they apprehend themselves to stand in relation to whatever they may consider the divine"; in a phrase, the varieties of religious experience, and in his Gifford Lectures at Edinburgh in 1901-1902, now published under that title in book form, Prof. William James insists that such phenomena as conviction of sin, conversion, ecstasy, indwelling of the Holy Spirit, control by the same, even physical changes due to religious emotion, are all genuine phenomena, and therefore legitimate subjects of scientific inquiry. The tendency of modern science is entirely away from the crude mechanical materialism of the nineteenth century. Of that epoch Prof. James could say truly: "Medical materialism finishes up Saint Paul by calling his vision on the road to Damascus a discharging lesion of the occipital cortex, he being an epileptic. It snuffs out Saint Teresa as an hysteric, Saint Francis of Assissi as an hereditary degenerate. George Fox's discontent with the shams of his age, and his pining for spiritual veracity, it treats as a symptom of a disordered colon. Carlyle's organ-tones of misery it accounts for by a gastro-duodenal catarrh. All such mental over-tensions, it says, are, when you come to the bottom of the matter, mere affairs of diathesis (auto-intoxications most probably), due to the perverted action of various glands which physiology will yet discover" (*Varieties of Religious Experience*, 1929, p. 13). But modern physiology has moved far away from such a position.

We have all along been told that it is the mind which makes the body rich; we are now discovering that it is also the mind which makes the body poor. Quacks and impostors of all sorts, from Cagliostro and Mesmer down to Mary Baker Eddy, have all fastened upon this much of the truth, otherwise their teaching would have fallen flat long ago. Modern physiology has revealed the enormous influence of endocrines upon the

automatic or subconscious activities of the body, and has shown how these in their turn are affected by purely mental conditions. Under the name of psycho-therapy, faith-healing, mind-healing, hypnotic and other suggestions have now come into their own, and it is now recognized that the chief aim of a medical man is to treat not so much the disease as the patient. The days are passing when a doctor, reviewing his conduct of a case, would be content to say : " No doubt the patient died, but he died cured." Indeed, it may be said, that in all functional disorders the influence of the mind is paramount, and that even in organic disorders that influence for good or ill still operates to a surprisingly large degree. In his *Hypnotism*, 1906, pp. 219-220, Prof. Fœrel gives a whole page of morbid conditions which respond to suggestion, sometimes much more readily than to drugs, and similar results have followed the experiences of Dr. Morton Prince, Dr. T. W. Mitchell, Dr. Schofield, Prof. Moll, Prof. Walsh, and other psychiatrists. The well-authenticated performances of fakirs, jogis, and other mystics have demonstrated in almost incredible fashion the mastery of mind over matter, and we are continually being reminded of Huxley's caution : " There is nothing impossible except a contradiction in terms."

Man is a curious creature, a unique creature, a little world in himself, a genuine microcosm corresponding in all respects to the macrocosm outside. A trinity in unity, he is composed of spirit and soul and body (1 Thess. v, 23). His body (*sōma*, *corpus*, *corpse*) is material, came from the earth, is nourished by the earth, " mother earth," and returns to the earth when he is done with it. It is not the man, but only his case, his carcass, and by it he is linked to the material world of physics and chemistry. His soul (*nephesh*, *psuchē*, *anima*, *life*) is that which he possesses in common with all living things, that bit of him which loves and hates, remembers and forgets, which has appetities, passions, emotions, desires, all of them things which his dog can do and many of them better than its master. By his soul man is self-conscious and linked to the whole world of life. His horse and dog are relations, poor relations if you like—but I remember Montaigne—but still relations. On the other hand, man is a spirit (*ruach*, *pneuma*, *spiritus*), that part of him which can draw a picture, a thing which the most primitive and degraded man can do, but which the most highly trained fox-terrier cannot do ; which can draw a picture and frame and use

the multiplication table. This part of him is in touch with other spirits, of men like himself, of other non-human spirits good and bad, angels and demons if you like, and with God who is Spirit. Thus man is God-conscious, *anthrōpos*, the up-looker, the worshipper, and such worship is of the very essence of his nature. Man is thus in touch with every part of God's creation, sitting like a spider in the centre of the web and responsive to every influence, physical, psychical or spiritual, a unique being, occupying a unique and central position.

Now among such influences, if the universal belief of mankind is to be trusted, and if we are to accept Vincent's Rule, *Quod semper, quod ubique, quod ab omnibus*, we must include the influence of spirits good and bad. The man who says, "I believe in the Holy Ghost," is at the same time implying that there may be other ghosts, not necessarily holy, and when we explore the wide field of anthropology in, say, Frazer's *Golden Bough*, we have to face a universal belief in spirits, extra-human or formerly human, *i.e.* spirits of the dead, good or bad, but mainly malevolent, requiring to be propitiated by sacrifices, often of a bloody nature. Such beliefs have come down from the remotest civilizations, are world-wide, and held by all sorts and conditions of men. Even the most stubborn materialist of the nineteenth century is sometimes taken aback by the sudden revelation of his subconscious paganism or nature-worship.

"Just when we are safest, there's a sunset-touch,
A fancy from a flower-bell, some one's death,
A chorus-ending from Euripides—
And that's enough for fifty hopes and fears
As old and new at once as nature's self,
To rap and knock and enter in our soul,
Take hands and dance there, a fantastic ring,
Round the ancient idol on his base again—
The grand Perhaps."

The suggestion seems to be that we are four-dimensional beings conditioned by—some would say imprisoned in—a three-dimensional body, and occasionally the walls of our shell are worn so thin that the extra dimension breaks out with surprising results quite inexplicable by physics or chemistry and even physiology.

Scripture has always affirmed that this universe has a spiritual and not a mere material basis. Framed by the word of God,

Himself Spirit in Essence, created specifically by the Logos and restored and maintained by the Holy Ghost, it is alike for the Bible student and the modern man of science the expression of a Will, of a Personality, who, in the words of Sir J. H. Jeans, must be at the very least a high-class mathematician. This mysterious Godhead, however, operates through inferior divinities or super-human beings, known to us as angels. The term "angel" means, alike in Hebrew and Greek, a messenger, and in the Old Testament is used impartially of both human and super-human agents; in the New Testament of the latter exclusively, unless the angels of the churches in Rev. ii, iii, are to be regarded as men. They are creatures, "sons of God," their proper sphere is heaven, though they come here to minister to the saints, and they will be under Christ and His saints by-and-bye. They excel in strength, have an important part to play in the judgments to come, and, meanwhile, are more intimately connected than most people imagine, with health and disease, and even with physical phenomena. They have repeatedly served to communicate God's Will, are at present interested spectators of the work of grace, and play an important part in protecting and guiding God's people on earth. We Protestants have lost something by neglecting the Bible teaching about guardian angels. Two angels are named for us, Gabriel and Michael, the latter particularly charged with the interests of the Jews.

In short, Scripture supports the ancient Greek conception of the world as controlled by intelligent agents, a naiad in every spring, a dryad in every tree, a conception of the world infinitely superior to the dead mechanism of the later nineteenth century, and fully justifying Wordsworth's indignant protest: "Great God, I'd rather be a pagan, suckled in a creed outworn." [It is hardly necessary to say that Scripture gives no countenance to the popular notion that dead believers become angels.]

But Scripture also asserts a hierarchy of evil. There is a trinity of evil opposed to the Trinity of the Godhead, each to each. Thus the world is specifically opposed to the Father (1 John ii, 15-17), the flesh wars against the Spirit (Gal. v, 16-26), and the devil is the personal antagonist of the Son of God. That there is evil in the world is admitted, and discussion of its origin is irrelevant to the present thesis. It is persistent, *semper, ubique, ab omnibus*, continually turning up in new forms, but always directed towards one end, viz., denial of Jesus Christ as God manifest in flesh, the Saviour from sin. It is intelligent,

organized, a huge spiritual force, inspiring individuals, classes, even nations and ages, a world-force, an imitation of God's ways, in short, an *organization*.

The head of this organization is the chief of God's created beings, one who sealed up the sum of wisdom and beauty, gifted with peculiar potentialities and privileges (*see* Ezek. xxviii, 11-19), now fallen through pride and wilfulness and animated by intense hostility to the human race and to the Son of Man, whose title to Deity he persistently repudiates. Though still in heaven, where he is the accuser of the brethren, he claims the lordship of earth (Luke iv, 5-7), as both prince and god of this world, the whole of which now lies in his power. He is the head of that evil organization—the principalities, the powers, the world-rulers of this darkness, the spiritual (hosts) of wickedness in the heavenly (places) (Eph. vi, 12). This passage is indeed of such prime importance in considering the present problem that in addition to the Revised Version quoted above some modern translations may be cited: "Ours is not a conflict with mere flesh and blood, but with the despotisms, the empires, the forces that control and govern this dark world, the spiritual hosts of evil arrayed against us in the heavenly warfare" (Weymouth). "For our struggle is not against enemies of flesh and blood, but against the powers of evil, against those that hold sway in the darkness around us, and against the spirits of wickedness on high" (Twentieth Century New Testament). More literally: "For our struggle is not against blood and flesh, but against principalities, against authorities, against the universal lords (*kosmokratores*) of this darkness, against spiritual power (or powers) of wickedness in the heavenlies" (J. N. Darby). Also literally: "For our wrestling is not against blood and flesh, but against the principalities, against the authorities, against the world-rulers of this darkness, against the spiritual (hosts) of wickedness in the heavenly (places)" (W. Kelly). Finally (Moffatt): "For we have to struggle not with blood and flesh, but with the angelic Rulers, the angelic Authorities, the potentates of the dark present, the spirit-forces of evil in the heavenly sphere." Continental versions, *e.g.* Luther, Segond, Ostervald, Diodati, all use the same language.

Fools make a mock at sin, but to the intelligent Bible student Satan is no subject for jest, but the awful Arrogance that dared to patronize the Son of God; the dread Potentate whom even the archangel Michael did not dare rebuke, but left that to the Lord.

We read of certain angels, probably the "sons of God" of Gen. vi, who abandoned both their nature and their place, and are in consequence imprisoned, awaiting their final judgment (2 Pet. ii, 4, and Jude 6). With these we are not concerned, our business being with those emissaries of Satan known as demons, improperly translated "devils" in New Testament. The terms used of them are *daimōn* (5 times) and *daimonion* (57 times) always in an evil sense, as is also the word "demonized" (13 times), nearly always rendered "possessed with devils."

They are described in the New Testament as spirits, emissaries of Satan, so numerous as to make his power practically ubiquitous, able to control both men and animals, possessed of super-human strength and knowledge. They can inflict physical maladies, although one has to distinguish mental *disease* from disorders of mind due to demon-*possession*. They are characterized as sullen, unclean, lying, malicious; they earnestly desire embodiment, without which they are apparently harmless for evil. They know Jesus Christ as the Most High God and recognize His supreme authority, they also know their own eternal doom ("believe and shudder," Jas. ii, 19), but they protest against premature punishment ("before the time," Matt. viii, 29). They are, above all, deceitful, presenting a perfect counterfeit of God's operations, calculated sometimes to deceive even the elect. Thus we read of the cup of demons, the table of demons, the synagogue of Satan, Pharisees of their father the devil, a son of Gehenna instead of a son of the law, of Satan appearing as an angel of light, of the deep things of Satan in contrast with the deep things of God, of the mystery of lawlessness (*anomia*) in contrast with the mystery of godliness. Defoe was well within the truth when he wrote:—

"Whenever God erects a house of prayer
The devil always builds a chapel there,
And 'twill be found upon examination
The latter has the larger congregation."

According to the New Testament, demon influence may show itself in religious asceticism and formalism (1 Tim. iv, 1-3), degenerating into uncleanness (2 Pet. ii, 10-12), and a sign of it is departing from the faith. Though all unbelievers are open to demon-possession (Eph. ii, 2), their influence is especially directed against spiritually minded believers (Eph. vi, 12;

1 Tim. iv, 1-3), who, therefore, need the panoply of God in addition to prayer and bodily control. The idol-worship of pagans is at bottom, demon-worship (1 Cor. x, 19-22), the worship of powers of evil, and reaches its culmination in modern devil-worship and Satanism. Demons may be, and often were, exorcised in many ways, often involving physical torture of the patient; but in the New Testament examples they depart instantly at the command of Christ, and when exorcised in His name by His servants, a practice carried on to the present day with similar effects. There seems to have been—as was only to be expected—an increase of demon-activity in the time of Christ and the Apostolic age, and we are assured that there will be a similar outburst at the end of this age, immediately before the Second Advent (Rev. ix, 1-11).

Their methods are clearly set forth under seven heads, as follows:—

1. They blind the minds of unbelievers (2 Cor. iv, 4), darkening their understanding (Eph. iv, 18), alienating them from the life of God because of ignorance (Col. i, 9), blinding them with wrong thoughts about God, prejudices of all kinds, earthly philosophy and false reasonings about spiritual things, or sowing tares, filling men's minds with earthly things, idols (appearances, shams), cares, and pleasures.
2. They work in men unconsciously, so that these become children of wrath (Eph. ii, 1-2).
3. Like the fowls of the air they snatch away the word of truth (Matt. xiii, 19).
It is sad to think where most of these fowls are getting shelter to-day.
4. They produce a false peace (Luke xi, 21), so that the wicked have no bands in their death (Ps. 73).
5. They incite all manner of opposition to the truth (2 Tim. ii, 25-26).
6. They counterfeit the true work of God, sowing tares so like wheat that mere human skill is unable to discriminate (Matt. xiii, 25-39). The real test is *fruit*. "In this the children of God are manifest and the children of the devil" (1 John iii, 10).

7. They seek to obtain possession of men as their instruments.

Under this last head there are numerous references. We read of unclean spirits, of the spirit of Python for fortune-telling and prophecy, of magical arts, seducing spirits, spirits that chirp and whisper, spirits of the dead consulted, an offence punishable with death under the Mosaic law, of familiar spirits, of sorcery, of witches, of the mystery of lawlessness already at work (2 Thess. ii, 7). Of one person only, Judas Iscariot, it is said that Satan entered into him. In the coming day, however, we shall have the anti-Christ, a Satanized man, "whose coming is after the working of Satan with all powers and signs and lying wonders" (2 Thess. ii, 8). Men would not receive the truth, therefore they shall believe the lie.

A great deal of mis-spent sympathy has been expended upon the subject of witches, especially in the seventeenth century, and it is certainly the case that many innocent persons were cruelly done to death owing to the shocking ignorance and prejudices of their persecutors. On the other hand, in this, as in other matters, the twentieth century is endeavouring to reverse the verdict of the nineteenth. If it be granted that a man may be indwelt by the Holy Spirit—and that is the definition of a Christian (Rom. viii, 9)—it cannot be denied that another man may be indwelt by another spirit, very far from holy. *Dr. Jekyll and Mr. Hyde* will occur as a case in point, and *The Necromancers* of Hugh Benson, and, more recently, *Witch Wood*, by John Buchan. You say this is fiction; true, but fiction founded on fact, as we shall see, and in the case of Mr. Buchan we are dealing with a man who is not merely a novelist but an historian, and one, moreover, who has made a special study of Lowland Scotland in the seventeenth century. In this connection it is well to ponder the words of the latest historian of Scotland on this very subject. "The most extraordinary of all manifestations of this time was one which recent scholarship is beginning to estimate at its real importance—witchcraft. It is no longer possible to regard the witch as a harmless, wretched, half-witted creature whom ignorance, superstition, and cruelty condemned to torture and a horrible death. A closer study of the immense amount of evidence bearing upon witchcraft has compelled a greater respect for the contemporary alarm which it excited. The easy scepticism of the nineteenth

century is no longer tenable. Christianity had won—especially in remote and sparsely populated districts—only a superficial victory over paganism. The old nature cults of fertility, the earth, the Great Mother, lived on in debased and subterranean forms. . . . Plants that had lived in the dark for long ages sprouted suddenly, and offended the sunlight with noxious blooms” (George Malcolm Thomson, *A Short History of Scotland*, 1930, p. 150).

Seeing then that we are open to influences alike from good and evil sources, the advice of St. John to test the spirits is still a prime necessity (1 John iv, 1-3), and the same test still holds good. Is this Jesus Christ of Nazareth not only the Lamb of God who taketh away the sin of the world, but God manifest in flesh? The Christian Church is founded upon the great Confession (Matt. xvi, 16), that Jesus is the Christ, the Son of the living God, but this is precisely the one truth which these evil spirits will not admit, any more than their head. In view of the great extension of spiritism the application of such a crucial test is more necessary than ever, and in face of such popular doctrines as denial of atonement, explaining away sin as simply weakness, frailty, elimination of the blood from what they call “a religion of the shambles,” watering down judgment, affirmation of “a second chance,” and self-redemption, with, of course, the reduction of Jesus Christ to a mere teacher, an idealist, self-deceived, full of the ignorance, superstitions and prejudices of His age, it is not difficult to realize that spiritism, now become a religious cult, is quite definitely anti-christian. A summary of its teaching will be given later on.

Coming now to actual cases of demon-possession in New Testament times and their symptoms and treatment, certain general features emerge from the Gospel narratives. For example, in Mark ix, 17-27, we are told of a boy possessed from childhood by a deaf and dumb spirit which often threw him down foaming at the mouth, casting him even into fire and water. At the sight of Jesus the spirit at once convulsed the boy, and he fell on the ground and rolled about foaming. At the Lord’s word of command the spirit came out after shrieking aloud and convulsing the boy violently, leaving him so like a corpse that most people thought he was dead. The same shrieking and convulsions are displayed by the unclean spirit of Mark i, 23-27; this time affecting a man. Super-human strength is exhibited by the Legion-driven victim of Mark v, 2-10, as well as by the

man of Acts xix, 13-16. In this latter case the spirit replies : " Jesus I know (*ginōskō*) and Paul I am acquainted with (*epistamai*); but who are ye ? " The multiple personalities of Legion find a parallel in the seven demons expelled from Mary of Magdala. The evil spirits protest against torment before the time (Mark i, 5), and recognize Jesus as their future judge. What astonished the Capernaum crowd was not the expulsion of demons—their own exorcists did that—but the strange fact that these demons came out at once on Christ's word of command (Mark i, 27), a feat repeated in the experience of the twelve and the seventy, who, in their proclamation of the Gospel of the kingdom, were overjoyed at finding even the demons subject to them through His name (Luke x, 17). The same invocation is used by St. Paul to cast out the spirit of divination from the girl at Philippi, an interesting case, showing that these evil spirits have access to super-human stores of knowledge, a phenomenon now quite familiar to us in spiritistic séances. Summarizing these phenomena, Prof. Oesterreich in his latest book *Possession, Demoniacal and Other*, London, 1930, says : " The narratives are of an entirely realistic and objective character. In particular, the succinct account of Jesus' relation to these events, His success and failure, together with that of His disciples, as well as the particulars of His cures, coincide so exactly with what we know of these states from the point of view of present-day psychology, that it is impossible to avoid the impression that we are dealing with a tradition which is veracious " (*op. cit.*, p. 5). It may be remarked in passing that the avowed enemies of Christ did not deny the reality of these phenomena, but ascribed them to Satanic agency (Matt. xii, 22-32), thus convicting themselves of blasphemy against the Holy Ghost. The word " failure " quoted above, refers of course, to the incidents at Nazareth (Matt. xiii, 53-58), where, as Moffatt puts it : " There He could not do many miracles owing to their lack of faith," and to the same cause is assigned the failure of the disciples in Matt. xvii, 14-21.

Similar cases meet us all down the centuries. Oesterreich, for example, gives instance after instance from the second century down to the nineteenth. Even Harnack confesses that this state " often defies scientific analysis even in our own times, and leaves us all at liberty to suppose that certain mysterious forces are brought into play. In this domain there

are facts which cannot be ignored and yet of which no explanation is forthcoming.”

One case may suffice for the nineteenth century, reported by Dr. Justinus Kerner, of Swabia. The patient was a peasant woman of 34 years. . . . Her past life up to this time had been irreproachable. . . . Without any definite cause which could be discovered, she was seized in August, 1830, by terrible fits of convulsions, during which a strange voice uttered by her mouth diabolic discourses. As soon as this voice began to speak (it professed to be that of an unhappy dead man) her individuality vanished, to give place to another. As long as this lasted she knew nothing of her own individuality, which only reappeared in all its integrity and reason when she had retired to rest.

The demon shouted, swore, and raged in the most terrible fashion. He broke out especially into curses against God and everything sacred. Bodily measures and medicine did not produce the slightest change in her state, nor did a pregnancy and the suckling which followed it. Only continual prayer (to which, moreover, she was obliged to apply herself with the greatest perseverance, for the demon could not endure it) often frustrated the demon for a time.

During five months all the resources of medicine were tried in vain. . . . On the contrary, two demons now spoke in her, who often, as it were, played the raging multitude within her, barked like dogs, mewed like cats, etc. Did she begin to pray the demons at once flung her into the air, swore and made a horrible din through her mouth. When the demons left her in peace, she came to herself, and on hearing the accounts of those present and seeing the injuries inflicted upon her by blows and falls, she burst into sobs and lamented her condition. . . . By hypnotic treatment one of the demons had been expelled before she was brought to me, but the one who remained only made the more turmoil. Prayer was also particularly disagreeable to this one. If the woman wished to kneel down to pray the demon strove to prevent her with all his might, and if she persisted he forced her jaws apart and obliged her to utter a diabolic laugh or whistle. . . . She was able to eat nothing but a soup of black bread and water. As soon as she took anything better the demon rose up in her and cried: “Carrión should eat nothing good!” and took away her plate. She often fasted for two or three complete days without taking a crumb of food and without

drinking a drop, and on these days the demon kept quiet (Kerner, *Nachricht um dem Vorkommen des Besessenseins*, Stuttgart, 1836, p. 27).

Let me add one case of seven years ago, reported to me by relatives. This was a boy of four, a son of respectable parents, well brought up, and exhibiting usually all the characteristics of a boy of such an age and training. But occasionally he is suddenly attacked by "fits" of a peculiar nature. His countenance changes, becoming Satanic in expression, his voice is altered, and out of his mouth proceeds a fluent stream of horrible talk, profane, filthy, obscene, and blasphemous, the vocabulary of a very depraved adult man. His nature, too, is altered for the worse. He attacks his pet dog with whatever comes to hand, a fork in one instance, and should his mother and nurse interfere the assault is diverted to them. In this condition he remembers his normal experiences, but when exhausted he has fallen asleep and wakened again he knows nothing of this abnormal state. Now Jekyll-Hyde theories of alternating personality will not fit here. Jekyll and Hyde, to speak in the plural, were both adults with a long trail of personal experience behind them. But where did a boy of four get even such a vocabulary? We know both the extent and content of the vocabulary of such a boy, and it is neither profane nor filthy, much less blasphemous. How account for the change of features, of voice, of behaviour? A Hindu or Theosophist may mutter something about Karma and reincarnation, but if we understand that doctrine it is supposed to make for reformation and upward progress, whereas in this and similar cases the change of personality is for the worse, downward with a vengeance, and invariably and inveterately opposed to God and all goodness. Theories of split consciousness, of dissociated personality, are to be found in most books on hypnotism and psycho-therapeutics, but they raise more difficulties than they profess to solve, and Sir Isaac Newton long ago laid down the useful principle that when two explanations are possible of the same phenomena we should always take the simpler, the one which involves the assumption of less machinery. In all these cases that simpler solution seems to be the invasion of one person's will by another and a dominating will, almost always an evil one.

A clear distinction must be drawn here between obsession and possession, all the more that by French writers such as

Janet, who have given considerable attention to the subject, the former term includes both conditions. Obsession is fairly common; it is the domination of conduct by some *idée fixe*. Thus Dr. Johnson, an eminently level-headed man, felt himself compelled to touch every post that he passed in the street. Young children often display self-compulsions of this sort, for example, they take care to step exactly in the centre of pavement flags, avoiding the joints, or it may be the other way about. One of Oppenheim's patients could not go into the street because he was distracted by the idea of wounding someone with his walking stick or umbrella. Although the forms of obsession are innumerable and for the most part harmless, they constitute a real mental torture when almost every idea takes the form of a challenging question, when every action or sensation arouses the question: What does this mean? Why am I doing this? Why am I doing this thing instead of that other thing? Why is this object in this place? etc. Sometimes these compulsive ideas may have a religious content, the most frequent taking the form of blasphemy, and in such a case they may be mistaken for genuine possession, which is really demoniacal somnambulism. Poulain makes the distinction clear, the crux being loss of consciousness on the part of the patient. "We shall call a person *possessed* by the demon in the strict sense of the word when at certain moments the latter makes him lose consciousness and then seems to play in his body the part of the soul; he uses, at least to all appearances, his eyes to see with, his ears to listen with, his mouth to speak with, whether it be to those present or to his companions. It is he who suffers as if from a burn if his skin is touched by an object which has been blessed. In a word, he seems incarnated. We shall call a person *obsessed* when the demon never makes him lose consciousness, but, nevertheless, torments him in such a manner that his action is manifest; for example, by beating him."

Ribet makes a similar distinction. "Possession is the invasion by the demon of the body of a living man, whose organ he exercises in his own name and at will, as if the body had become his. In possession the spirit acts from within and seems to be substituted in the body for the soul which animates and moves it." Obsession, on the other hand, is "an extrinsic compulsion, which, while leaving to the mind the consciousness of its vital and motor action upon the organs, nevertheless, imposes itself with such violence that the man feels within him two beings and

two principles in mutual conflict : the one external and despotic, which seeks to invade and dominate, the other internal, that is to say, the soul itself, which suffers and struggles against this foreign domination." When such attack or invasion has not been successfully resisted, or when resistance has been worn out, further development may take one of two forms. The first is demoniacal somnambulism, in which the original personality disappears altogether, being displaced by the second or invading personality, which was at first merely a compulsive state. This seems to be the rule with young people, in whom their own personality is not yet so strongly developed as in adults. The second form is a gradual fusion of the two consciousnesses, in proportion as the dominating influence is accepted or submitted to ; the individual in this case remains conscious of who he is, but his character suffers a complete change for the worse ; Mr. Hyde has overcome Dr. Jekyll.

Ribet's description of possession at once recalls the behaviour of " mediums " under the action of their " controls," always supposing that such behaviour is absolutely genuine and not fraudulent, and, unfortunately, a good many of the phenomena observed at such séances go far to warrant the contention of the Roman Catholic Church that all such manifestations are diabolical at bottom, due to lying spirits which are adepts at impersonation. The Roman Catholic point of view is well and very fully set forth by Montague Summers in *The History of Witchcraft and Demonology*, London, Kegan Paul, 1926. In this, *inter alia*, he gives in full the form of exorcism used in the ritual of that church (pp. 211-219). We shall return to this point later on, but, meantime, repeat the warnings uttered by every responsible leader of psychical research, that all such attempts to render one's own consciousness recessive, to use the Mendelian term, whether by drugs, hypnotism, or incantation, are fraught with the utmost permanent and dangerous consequences. Speaking of planchette, ouija board and other purely mechanical devices for revealing subconscious muscular action, Sir William Barrett warns us that autoscopes very often tend to become heteroscopes, that is, instead of revealing the hidden workings of our own personality they end by showing the hand of an independent and ultimately a dominant performer. No more pernicious advice was ever given than that of Sir A. Conan Doyle when he advised women to practise automatic writing. They will very soon find their hands controlled by another, generally lower in

the moral scale. In fact, in view of the maze of deceit, conscious and subconscious, and extra-conscious, a psychical researcher requires the scepticism of St. Thomas in multiple measure, distrusting the evidence of his own senses and seeking to replace these by recording instruments, thermometers, barometers, seismographs, balances, galvanometers, etc., which can neither lie nor be cheated.

The external signs of possession have been described again and again, and show three outstanding features: change of physiognomy into Satanic or demoniac features; change of voice corresponding to the "invading" personality, *e.g.* when a little girl of eleven speaks in a deep bass voice; and, most important of all, change of nature or at least of behaviour, the use of filthy and blasphemous language and persistent mockery of sacred things and persons. Very often these changes are accompanied by violent motor activities, convulsions which in many cases are quite senseless, some, indeed, inimitable in the waking state, and nearly always super-normal in strength as in maniacal attacks.

The best account in modern times is that given by Dr. Nevius. He was a missionary in China for forty years, and had abundant opportunity of observing demon-possession in all its forms. By means of a questionnaire addressed to his fellow-labourers all over China he was able to supplement his own work by the personal observation and experience of these others—no second-hand evidence was admitted—and the facts thus collocated, from over forty cases, may be summarized as follows:—

1. Certain abnormal physical and mental phenomena such as have been witnessed in all ages and among all nations, and attributed to possession by demons, are of frequent occurrence in China and other nations at this day, and have been generally referred to the same cause.
2. The supposed "demoniac" at the time of possession passes into an abnormal state, the character of which varies indefinitely, being marked by depression and melancholy, or vacancy and stupidity, amounting sometimes almost to idiocy; or it may be that he becomes ecstatic or ferocious and malignant.
3. During transition from the normal to the abnormal

state the subject is often thrown into paroxysms more or less violent, during which he sometimes falls on the ground senseless or foams at the mouth, presenting symptoms similar to those of epilepsy or hysteria.

4. The intervals between these attacks vary indefinitely from hours to months, and during those intervals the physical and mental condition of the subject may be in every respect healthy and normal. The duration of the abnormal states varies from a few minutes to several days. The attacks are sometimes mild and sometimes violent. If frequent and violent the physical health suffers.
5. During the transition period the subject often retains more or less of his normal consciousness. The violence of the paroxysms is increased if the subject struggles against and endeavours to repress the abnormal symptoms. When he yields himself to them the violence of the paroxysms abates, or ceases altogether.
6. When normal consciousness is restored after one of these attacks the subject is entirely ignorant of everything which has passed during that state.
7. The most striking characteristic of these cases is that the subject evidences another personality, and the normal personality for the time being is partially or wholly dormant.
8. The new personality presents traits of character utterly different from those which really belong to the subject in his normal state, and this change of character is, with rare exceptions, in the direction of moral obliquity and impurity.
9. Many persons while "demon-possessed" give evidence of knowledge which cannot be accounted for in ordinary ways. They often appear to know of the Lord Jesus Christ as a Divine Person, and show an aversion to and fear of Him. They sometimes converse in foreign languages of which, in their normal state, they are entirely ignorant.
10. There are often heard in connection with "demon-

possessions," rappings and noises in places where no physical cause for them can be found, and tables, chairs, crockery, and the like are moved about without, so far as can be discovered, any application of physical force, exactly as we are told is the case among spiritualists. Such phenomena are now generally called "poltergeist" (Ger. = tricky spirits), and in their un-coordinated and senseless destruction they closely resemble a students' "rag" or the antics of the undisciplined and irresponsible schoolboys of the invisible world.

11. Many cases of "demon-possession" have been cured by prayer to Christ or in His name, some very readily, some with difficulty. So far as we have been able to discover this method of cure has not failed in any case, however stubborn and long-continued, in which it has been tried. And in no instance, so far as appears, has the malady returned, if the subject has become a Christian and continued to lead a Christian life. (Dr. Nevius, *Demon-Possession and Allied Themes*. Fleming H. Revell Co., 5th ed., New York, 1896.)

Dr. Nevius' first proposition admits of no doubt. Whether we call it spiritualism, spiritism, or demonism, the condition in question complies with Vincent's rule, *quod semper, quod ubique, quod ab omnibus*. In many cases, however, non-human spirits have been confounded with spirits of the dead, and there seem to be several points of resemblance. When the soul is liberated from the body at death it continues to exist in what St. Paul calls the "unclothed" state, preserving its personality more or less unchanged. The disembodied soul or spirit seems to retain knowledge, feeling, will, memory, and consciousness, to a certain extent, of earth events. It may even gain in knowledge, as if getting access to some universal store, and such knowledge may even extend to the future. It often acquires the power to move inanimate objects, to take possession of animals, and to obsess or possess man. On the other hand it has lost a good deal, and is always represented as comparatively helpless, unable to take care of itself, and requiring to be sheltered and protected, like one entering upon a second infancy in a new and very strange world. A very full account of ancient beliefs on this subject is given by Professor Paton, of Hartford, *Spiritism and the Cult*

of the Dead in Antiquity. London: Hodder & Stoughton, and Macmillan Co., 1921.

Objection may be made that all these phenomena are due to delusion or imposture, and that the subjects of them are either deceivers or at best, self-deceived. It is undoubtedly the case that there is no subject so much enwrapped in trickery and deceit as psychical research. Man, who has been defined as the cooking-animal or the tool-using animal, might with greater force be described as the only animal who not only cheats his own species, but takes a positive pleasure in doing it. Even high-class mediums like Eusapia Palladino have not been above "helping" a psychic manifestation, just as teachers of chemistry have been known to "assist" an experiment which for some reason or other was not working properly. But after nine-tenths of such scenes have been written off in this way, there still remains an irreducible tenth, conducted under strict test conditions and supported by the very soundest of evidence on the part of highly skilled and specially trained observers. It is too late, at this time of day, to advance any such objection.

Others regard them as the result of some occult force, odic or odyllic, not yet clearly understood. This explanation has a great deal to say for it, and it certainly explains a very large part of the phenomena known as metapsychic. Perhaps the best classification of these obscure subjects is that given by Boirac, based upon supposed or possible causes. He classifies metapsychic phenomena under three main heads: hypnoidal, magnetoid, and spiritoid. By hypnoidal he means explicable by forces already known, operating according to laws not yet fully known, and this division includes A, psychopathic; modification of the mental or nervous states of the subject, as in suggestion and hypnotism; and B, cryptopsychic: intelligent action of the subject unknown to himself, as shown by autoscopes of all kinds. Magnetoid phenomena, on the other hand, are produced by forces still unknown and unclassified, but belonging normally to our world, analogous to natural radio-active forces. This includes A, psycho-dynamic: life acting upon (a) life or (b) matter through a force *sui generis*; B, telepsychical, including telepathy, clairvoyance, telesthesia, transmission of ideas and transmission of will; and C, hyloscopic: matter acting upon life, as in dowsing or water-divining, etc.

But Boirac's third division, spiritoid, is interesting because it covers the very ground we are exploring. These are pheno-

mena *seeming* to imply the intervention of forces (extra-natural), not necessarily belonging to our world, but which in some way make an abrupt irruption into nature from some plane of existence foreign to that on which we move : agents or forces yet unknown, but *intelligent*.

To classify these theories in a simpler way, they may be—

- (i) Physical, due to (1) wave motions of high frequency ; (2) radiation or emanation from nerve-centres ; (3) a universal “ fluid ” or world-soul (Virgil, Kant) ; or
- (ii) Metaphysical (1) Human, *i.e.* exteriorizations of the nervous system as in telekenesis, clairvoyance, etc. ; or (2) extra-human, (a) formerly human, *i.e.* dead : spiritualism ; (b) non-human : genii, angels, demons, etc. : spiritism.

The favourite explanation, generally given from pulpits in connection with the Gospel stories, and held by the majority of educated people in the present day, is what may be called the pathological one, that these manifestations are the natural results of diseased states of the nervous system, and are more especially related to hysteria and epilepsy. The Scriptures, however, never confound demon-possession with disease, and invariably discriminate by using different terms. Thus : “ He cast out the spirits with His word ; and all that were sick He healed ” (Matt. viii, 16). “ They brought to Him all that were ill (πάντας τοὺς κακῶς ἔχοντας), and that were possessed with demons (καὶ τοὺς δαιμονιζομένους),” lit. “ and the demonized ones,” “ and He healed many that were troubled with divers diseases and He cast out many demons ” (Mark i, 32-34). Again, “ They presented to Him all sick people that were taken with divers diseases (ποικίλαις νόσοις) and torments (βασάνοις), and such as were possessed by demons (δαιμονιζομένους) and lunatics (σεληνιαζομένους), and those who have the palsy (παραλυτικούς), and He cured them ” (Matt. iv, 24). Our Lord expressly distinguishes between possession and natural disease in the words, “ Behold I cast out demons (ἐκβάλλω δαιμόνια) and do cures (καὶ ἰασεῖς ἐποτελῶ) ” (Luke xiii, 32).

It is, of course, admitted that evil influences may more readily enter a weakened frame or a feeble mind or will, and it is a well-ascertained fact that the results of prolonged or recurrent demon-possession have morbid *sequelæ*, both physical

and mental. It is also admitted that certain nervous diseases, such as hysteria, epilepsy, idiocy and mania, have symptoms similar to those of "possession." But there are several marks which differentiate this latter. First, there is the automatic presentation and the persistent and consisting acting out of a new personality. This is shown by the categorical assertions of the person speaking declaring that he is a demon, and often giving his name and dwelling-place; secondly, by the discriminating use of pronouns, the demon always speaking of himself in the first person, of the spectators in the second, and of the subject in the third, regarding him as in the meantime unconscious and practically out of court. A similar discrimination applies to titles and epithets, and, as already mentioned the new personality manifests itself in sentiments, declarations, facial expressions and physical manifestations, all harmonizing with the above assumption. Another and very important differentiation mark of demon-possession is the evidence which it gives of knowledge and intellectual power not possessed by the subject, nor explicable on any pathological hypothesis. Finally, with the change of personality there is a complex change of moral character, debased and malicious, having an extreme aversion and hatred to God, and especially to the Lord Jesus Christ and the Christian religion. Prayer, or even the reading of the Bible or some Christian book, throws the patient into a paroxysm of opposition and rage, and persistence in such devout exercises is almost invariably followed by the return of the subject to the normal state.

Not all physicians, however, make light of the possession theory. Few, if any, British alienists have won a better right to be heard in the field of medical psychology than the late Dr. Forbes Winslow, and he was convinced "that a large proportion of the patients in our asylums are cases of possession, and not of madness. He distinguishes the demoniac by a strange duality and by the fact that, when temporarily relieved from the oppression of the demon, he is often able to describe the force which seizes upon his limbs, and compels him to acts or words of shame against his will." In 1877, he wrote in *Spiritual Madness*: "Ten thousand unfortunate people are at the present time confined in lunatic asylums on account of having tampered with the supernatural." And he goes on to say: "Not a week passes in which we do not hear that some of these unfortunates destroy themselves by suicide, or are removed to a lunatic

asylum. The mediums often manifest signs of an abnormal condition of their mental faculties, and among certain of them are found unequivocal indications of a true demoniacal possession. The evil spreads rapidly, and it will produce in a few years frightful results. . . . Two French authors of spiritualistic works, who wrote *Le Monde Spirituel* and *Sauvons le genre humain*, died insane in an asylum; these two men were distinguished in their respective professions—one as a highly scientific man, the other as an advocate well learned in the law. These individuals placed themselves in communication with spirits by means of tables. I could quote many such instances where men of the highest ability have, so to speak, neglected all and followed the doctrines of spiritualism only to end their days in the lunatic asylum.”

Sir William Barrett has already been quoted in connection with autoscopes, and in *Spiritualism: its Present-Day Meaning* (Fisher, Unwin, 1920), a very valuable symposium, he repeats the warning: “All excitable and unbalanced minds need to be warned away from a subject that may cause, and in many cases has caused, serious mental derangement.” So Dr. Stoddart and Dr. Hollander, Sir Bryan Denkin and other psychiatrists, but it will be sufficient to close with the considered judgment of Dr. Schofield. “Spiritism has been known to Christians for 2,000 years. Any benefit derived therefrom is more than neutralized by the very doubtful surroundings and character of the supposed revelation. If, however, it must be coupled with the dangers, horrors, and frauds that so often in modern spiritism accompany the knowledge of the unseen, we are almost as well without it, at any rate from such a source. . . . There can be no doubt that the epidemic will eventually subside, but before it does the vast mischief of a spiritual tidal wave of very doubtful origin will be most disastrously done, and thousands of unstable souls will be wrecked in spirit if not in mind and body as well” (*loc. cit.*, pp. 270-1).

It may be useful to have a conspectus of the diagnoses exhibited by epilepsy, hysteria, and imitative or similar disorders, and the following table is submitted from Wheeler and Jack's *Handbook of Medicine*, 5th edition, p. 518.

Full details of the successive stages of epilepsy, the aura or warnings, its actual fit marked by a cry, a tonic stage, a clonic stage, ending in coma, are to be found in all text-books of medicine. These symptoms are singularly lacking in the distinctive marks of possession as indicated in the table.

	Epilepsy.	Hysteria.	Uramic Convulsions.	Sham Fits.
Consciousness....	Lost	May be partially lost.	Lost in later stages : coma is prolonged and deep.	Normal.
Pupils	Dilated during fit.	Normal	First contraction followed by dilatation.	Normal.
Tongue	Often bitten	Normal	Normal	May be bitten to simulate real fit.
Restraint	Necessary to prevent accident.	Necessary to control violence.	Not necessary	Not necessary.
Onset	Rapid and sudden : patient falls unconscious.	Usually after some mental excitement, patient may fall into a "dazed" condition.	Preceded by alterations in health, urine, &c. Patient usually in bed before convulsions come on.	Always under conditions where the fraud may hope to gain sympathy. He falls in a businesslike manner, taking care not to sustain painful injuries.
Duration	A few minutes	Much longer	Prolonged	Variable.
Recovery	Moderately rapid.	Very variable	Slow, if not fatal	Very rapid after object has been gained.

There still remains the psychological theory, or rather theories, but these are not in agreement with one another, and are held even by their authors only as tentative and provisional. Moll and Forel, for example, argue from the materialistic standpoint, and talk about auto-hypnosis, split consciousness (really an abuse of terms, for an individual can neither be divided nor multiplied) alternation of personality, multiple personality, and so on, but even Ribot, discussing the hidden causes which lead to these "diseases of personality," as he calls them, admits complete ignorance of these causes. "The psychologist is then like the physician who has to deal with a disease in which he can make out only the symptoms." Myers, dealing with automatic writing, and finding that the handwriting of dead persons is often reproduced, that sentences are written in language which the writer neither knows now nor has ever known, that the replies contain facts quite unknown to any person present, thus excluding telepathy, and that these facts sometimes point to some person, now dead,

as their only conceivable source, says: "I readily admit that should the agency of departed spirits be established as a *vera causa*, then the explanations here suggested (*i.e.* on a purely psychological basis) will need revision in a new light" (*S.P.R. Proceedings*, May, 1885, p. 62). And later: "There has been evidence which points *prima facie*, to the agency of departed personalities, although this evidence has also been interpreted in different ways" (*S.P.R. Proceedings*, April, 1891, p. 11). In the thirty years which have passed since this utterance of Myers, the tendency of all recent psychical research is to strengthen the hypothesis, age-long and world-wide, of the existence of spiritual intelligences capable of producing effects on material objects, on living creatures, and on the physical and psychical condition of man himself; to quote Boirac once more: "Forces which in some way may make an irruption into nature from some plane of existence foreign to that on which we move; agents or forces, yet unknown, but *intelligent*." This is abundantly shown in cases of impersonation by J. G. Raupert in his two books, *The Dangers of Spiritism* and *Modern Spiritism*, in which, *inter alia*, he produces the evidence of such a lying spirit, as shown by the very remarkable facsimiles of automatic writing. See the former work, pp. 96-7 (Kegan Paul, 4th edition). This is not the place to discuss such phenomena as faith-healing, mind-healing, or to refer to the extraordinary healing powers of persons like Lord Sandwich, who produces genuine cures but cannot explain how.

For the whole question of healing this kind of sufferer, see E. R. Micklem's *Miracles and the New Psychology* (Oxf. Univ. Press), and C. J. Wright's *Miracles in History and in Modern Thought* (Constable).

We return again to Dr. Nevius and his Chinese experiences. He presents the following analogies with the well-known Scriptural cases:—

1. The persons affected are of both sexes and of all ages.
2. In many cases the attacks are intermittent, and commence by some physical disturbance or bodily convulsion. (Cf. Luke ix, 39, etc.)
3. In many cases the demon declares that he will never cease to torment his victims unless he submits to his will. The subject himself in his normal state,

bemoans his deplorable and hopeless condition, and sympathizing friends intercede for him. Frequently he pines away and dies.

4. Cases have occurred in which the subject has received bodily injuries or scars, as if from an unseen hand.
5. Some cases are easily cast out, while others present great difficulty.
6. While each invading demon has his own special features, more or less wicked, more or less violent, more or less daring, and so on, the cases yet all bear a general resemblance.
7. Some of the cases show shameless exposure of the person, gross indecency, and utter want of propriety in speech and conduct.
8. The greatest surprise of all to the missionary observers has been the fact that many of these spirits have a knowledge of God and of Christ, and they acknowledge our Lord's authority and power over them.
9. Sometimes there is a sort of double consciousness, of actions and impulses directly contrary. So the demoniac of Mark v, 6-7, "when he saw Jesus afar off, he ran and worshipped him," whereas the indwelling demon equally showed hatred and dread.
10. There have been cases of multiple possession. Cf. Luke viii, 2 ; Mark v, 9.
11. One of the most common characteristics of the Chinese cases is the instinct or longing of the spirit to possess a body, even an animal's body.
12. The expelled spirit tries his best to return. Cf. Matt. xii, 44.
13. We have exact correspondence in the assertion of a new personality, and the instinctive recognition of this new personality by all present. Long conversations are often carried on between them and the demon, the human subject or patient being entirely ignored, as a thing absolutely passive.
14. In no case has there been any failure to cast out demons in the name of Christ.

15. Demons are cast out or exorcised by others as well as Christians, although by different and generally painful methods. In this connection we recall Christ's query: "By whom do your sons cast them out?" (Matt. xii, 27.)
16. Cases have occurred of demons exorcised by those who have afterwards been guilty of gross immorality and been expelled from the Church. (Matt. vii, 22-23.)
17. The first effort of casting out demons in China as in India has been to arrest public attention, particularly having regard to the new and simple methods employed, and to give evidence readily appreciated and understood by the masses of the supernatural origin and truth of Christianity.
18. In one case reported by a missionary of the English Methodist Mission in Tien-tsin there was specific testimony to the character of the missionary similar to that given by the Philippian girl to St. Paul. (Acts xvi, 17.)
19. Alike in China and in the Scripture localities the cases are recognizable by the people who speak of them as if there could be no reasonable doubt concerning them.
20. The spirits are represented as free, and for the present roaming about at will, although still under certain limitations and control.
21. The evil spirits of Scripture are represented as belonging to the kingdom of Satan and in direct and acknowledged opposition to the kingdom of Christ. In China, as a rule, our cases are directly or indirectly connected with heathen temples and idolatrous worship.
22. In one case in the south-eastern part of the district of En-chiu, a demoniac slave-girl brought considerable gain to her master by fortune-telling as in the Philippian case of Acts xii.
23. The cases are very rare in large cities, occurring principally in rural and mountainous districts. No Scriptural case occurred in Jerusalem, and only one in

Capernaum in the very beginning of our Lord's ministry. (Mark i, 21-28).

24. As in the Scriptures the testimony as to the reality of these things is of the same quality as that which vouches for the Chinese cases ; the testimony of intelligent, unbiassed, common people, who were eye-witnesses of the events, and had no axe to grind. " Experts " are never quoted in Scripture, and it is as well, for on the authority of a great, perhaps the greatest, authority on the Law of Evidence, we are told that " There is no class of evidence to be received with greater suspicion than that of the so-called expert."

In view of such an accumulation of accredited testimony, based upon personal observation and experiment in the true scientific fashion, the closed attitude of the modern educated man is incomprehensible. " The refusal of modern ' enlightenment ' to treat possession as a hypothesis to be spoken of as even possible, in spite of the massive human tradition based upon concrete evidence in its favour, has always seemed to me a curious example of fashion in things scientific. That the demon theory (not necessarily a devil-theory) will have its innings again is, to my mind, absolutely certain. One has to be ' scientific ' indeed to be blind and ignorant enough to suspect no such possibility." (Prof. Wm. James, *Proceedings, S.P.R.*, vol. xxiii, p. 118.)

In the same strain we have the pronouncement of Prof. James Hyslop : " I have asserted that the explanation in this case is spirit or demoniac possession, as it was called in the New Testament. Before accepting such a doctrine I fought against it for ten years after I was convinced that survival after death was proved. But several cases forced upon me the consideration of the question. Experiments with a psychic appear to show that this was a case of spirit obsession, with the identity of the parties affecting the subject proved. The chief interest in such cases is their revolutionary effect in the field of medicine. It is probable that thousands of cases diagnosed as " paranoia " would yield to this sort of investigation and treatment. It is high time for the medical world to wake up and learn something." (*Life after Death*, pp. 305-6.)

Spiritualism, which generally means necromancy rather than spiritism, has now taken the form of a religion with many people,

and in view of the dangers arising from such traffic it may be useful to submit a synopsis of spiritualist teaching at its best, as an ethical system. (J. G. Raupert, *Modern Spiritism*.)

1. Christianity cannot be regarded as a revelation of a unique and specific character, foreshadowed in the Jewish ordinances, foretold by prophet and seer, and completed and consummated on Calvary, and on the day of Pentecost ; but it is one of many forms of high spirit manifestation designed to enforce upon man the binding obligations of the moral law inherent in his nature, and to remind him of the true character of his high origin and destiny.

2. Christ is not divine in the sense in which the Church throughout all ages has understood that term, and has believed and taught him to be divine. He is, on the contrary, a human being like ourselves, at best, perhaps a spirit of a high order and possessed of remarkable gifts and powers who, descending from the higher spheres and assuming a human body, was content to lay down His life as a testimony to the truth of the doctrines which He taught.

3. The teaching of the Church respecting His character and person and the aim and purpose of His death is based upon a misconception due to human error and weakness and to subsequent philosophical thought and speculation.

4. There is no priesthood specially set apart and ordained by Christ with a view to perpetuating His work and to forming the link between the sphere of the human and the divine.

5. The Church with its sacramental institutions for the effectual carrying out of this work and for the raising of the human soul to a supernatural life, for the imparting to it of supernatural gifts and graces, is a vain thing fondly invented, and at best an institution of mere human origin, and doing a purely human work.

6. The Scriptural notion of retribution after death and of punishment for sin committed in the flesh is a mis-reading and misinterpretation of the words of Christ, and of those feelings of failure and of loss which necessarily attend the slow process of human evolution, retribution only taking place in the sense that suffering must follow upon wrong, wilfully or ignorantly done, in order that thus the way to right doing and to right conduct may be found.

7. Man is daily and hourly, by his own deeds and misdeeds,

and by the general moulding and shaping of his character, preparing for himself his own heaven or his own hell ; these are, however, far other than those which theology holds and inculcates, and, of course, there is no devil.

8. Physical death does not in any sense determine the destiny of the human spirit ; but irrespective of personal beliefs or dis- or mis-beliefs, its training and education are continued and indefinitely prolonged in the spirit sphere.

9. Man is, in fact, in the truest sense of the word, his own saviour. Methinks we are familiar with many of these propositions to-day ; the mystery of lawlessness is already working, and in this new and fashionable " religion " God and Christ are politely but firmly shown to the door. In the words of Laplace, they have no need of that hypothesis.

From the evidence submitted above and corroborated from all quarters of the mission field, as well as by the discoveries of anthropologists in the study of primitive and retrograde races, confirmed as all these are by the solemn and persistent warnings of the most eminent psychical researchers, we are clearly entitled to take the New Testament accounts of demonism at their face value, as the unbiassed testimony of veracious witnesses. Having regard to movements within the professing Church to-day, the recrudescence of Giant Pope and Giant Pagan, the increasing arrogance of Rome, the extraordinary vogue of " fancy religions," such as Spiritualism and Christian Science, and, on the other hand, the steady and cumulative drift of the masses away from all church connections, we need not wonder that the plain believer finds himself living in the " difficult times," *καιροὶ χαλεποί*, of 2 Tim. iii, 1, and the description there given of the features of the " last days " might almost be taken as photographic of the present. In view, moreover, of the steady and determined resistance to all forms of good work, such as thrift, temperance, personal purity, repression of gambling and of the White Slave Traffic, etc., there can be no question that we are up against organized forces of evil, not merely sporadic and ephemeral, but directed and controlled by intelligences hostile alike to God and man. " *Ὅτι οὐκ ἔστιν ἡμῖν ἡ πάλη πρὸς αἷμα καὶ σάρκα, ἀλλὰ πρὸς τὰς ἀρχάς, πρὸς τὰς ἐξουσίας, πρὸς τοὺς κοσμοκράτορας τοῦ σκότους τούτου, πρὸς τὰ πνευματικὰ τῆς πονηρίας ἐν τοῖς ἐπουρανίοις.*

(Eph. vi, 12.)

DISCUSSION.

The CHAIRMAN (Dr. Thirtle) said : The paper which has been read in our hearing this afternoon has been at once comprehensive in treatment and convincing in substance. The lecturer has covered a wide ground, and the paper represents extensive reading as well as prolonged independent research. Recognizing these facts, we do not ignore the other fact that the subject is one that cannot but invite discussion ; in the first place, because in many respects the views expressed are based on inference and therefore capable of being construed from different standpoints ; and, in the second place, because on various grounds there is evidently room for divergence of opinion on the part of sincere investigators, whether such investigators may approach the subject from a philosophical point of view, or come to its examination on the ground of Scripture teaching and allusion.

Whatever may be our personal opinions or convictions, we have, I am sure, come to the conclusion that Dr. Knight has performed an important service to the reverent investigation of a subject of deep significance, by dealing with his theme in so thorough a fashion. The synopsis at the head of the paper seemed at the outset to strike one as almost alarming in its exhaustive sweep. But at length we found that all that was promised was made good in the course of the essay of thirty full pages.

As a memorial paper, in honour of the late Dr. A. T. Schofield, for many years an honoured Vice-President of the Institute, the essay has brought to its author a prize of ten guineas, awarded by the Council from the Schofield Memorial Fund, provided by the Schofield family ; but over and above that the essay has, I am certain, evoked from those who have heard, expressions of warm approval, which, I doubt not, will touch a still deeper chord of satisfaction in the mind of the learned lecturer.

It is not for me, in the few minutes at my disposal, to attempt the criticism of the paper ; nor is there call for words of superficial compliment. For many years past I have, in some measure, followed the subject, as represented in a wide literature ; but I am happy to

say that I have had no conscious contact with the victims of such disorders, mental and spiritual, as some of the pages describe. Yet those who have known subjects (or victims) of such possession may be prepared to say more, while some may desire to propound questions, which, by the happy presence of the lecturer, may receive ready and satisfactory answer.

It occurs to me, however, to remark that, being unusually long, it became necessary for some sections to be passed over in to-day's reading. In these circumstances, those who have not already read the lecture as a whole are advised, not forthwith to lay the printed paper on one side, but rather, while the interest is fresh in mind, to apply themselves to the document from beginning to end. This course will assuredly yield satisfaction, even as, later on, when given a place in the bound volume of *Transactions* of the Institute, so thorough and learned a piece of work will prove of great service for reference at a future time. We are likely, in coming days, to hear much about Demon-Possession in its various forms of manifestation, and in my judgment faithful Christian people will do well to keep themselves informed on the subject. Dr. Knight's pronouncement will, I doubt not, in many cases start a spirit of investigation, and assist to a wholesome judgment on the subject.

As I hand the prize cheque to the Lecturer, it gives me pleasure to ask that a hearty vote of thanks be accorded him for the paper he has read in our hearing. The resolution was accorded with acclamation.

Mr. SIDNEY COLLETT said: We all wish to thank Dr. Knight for his interesting, important, and solemn lecture. It must have entailed an immense amount of time and study. Such a lecture is, moreover, most timely, for it deals with one of the two terrible manifestations of Satanic power which we see at work on every hand to-day, viz., *Modernism* and *Spiritism*, and it is remarkable that these are the two manifestations specifically named in Scripture as indicating the close of this present age. For we read in 1 Tim. iv, 1, "The Spirit speaketh expressly that in the latter times some shall depart from the Faith" (that is, *Modernism*), "giving heed to seducing spirits and doctrines of Demons"—that is, *Spiritism*. Hence the terrible danger of the all-too-popular *Modernism* taught, alas, from so many of our pulpits to-day, which,

by questioning the verities of the Word of God, which is the voice of the Holy Spirit, exposes the heart to the malign influences of the spirit of evil.

I wish to call attention to one or two points in the lecture. First, on p. 120, the lecturer said that this world now lies *wholly* in the power of Satan, as prince and god of this world. But that, I submit, is not correct. For we learn from Job i, 10, that Satan could only touch Job to the extent that God allowed him to. I am aware that 1 John v, 19, tells us that "the whole world lieth in the wicked one," but thank God that does not say it lies *wholly* in his *unrestrained* or *unrestricted* power.

Then, on p. 122 (clause 2), the lecturer says: the evil spirits "work in men unconsciously, so that these *become* children of wrath," and he quotes Eph. ii, 1 and 2. But the passage does not say so. Verse 3, however, gives us the precise truth, viz., that men *by nature* are children of wrath, not that they *became* so by some evil influence brought to bear upon them.

Then, also, I should like to know what Dr. Knight means when, on p. 132, he speaks of the disembodied soul of man "gaining in knowledge," *acquiring power to move inanimate objects, to take possession of animals*, etc.

Mr. PERCY O. RUOFF said: Within the compass of thirty pages Dr. Knight has massed a good many facts, which, taken together, present an impressive statement on the subject. But I wholly demur to his opinion that there is "no superstition too gross, no theory too fantastic" to be swallowed by the uneducated. The truth probably is that, on the whole, the shrewd judgment of the uneducated classes dismisses with sure instinct the things which outrage common sense.

On p. 119 the lecturer, apparently without support, makes the extraordinary affirmation that angels "are more intimately connected than most people imagine with health and disease." It would be illuminating to see the proof of this. He also says that "Scripture supports the ancient Greek conception of the world as controlled by intelligent agents." No one can deny that the Bible reveals the action of agents affecting men, but in a thousand places the Bible, in various ways, indicates that the Sovereign Ruler is God, and He controls everything.

On p. 122, in a recital of the alleged Demoniac methods (under seven heads), the attribution of such works to demons rather than to the devil or to the natural evil of man's heart, is a doubtful attribution. The Scriptures affirm in regard to (1), (3) and (6) that the devil is the agent.

With regard to Spiritism, Dr. Knight is no doubt quite right in stressing its opposition to "atonement by blood." This has been my experience of all spiritists. On p. 127 a most mysterious case of a boy four years old is cited. It is so exceptional (perhaps unparalleled in any country) that I desire to ask Dr. Knight what steps he has taken thoroughly to investigate the circumstances. The paper merely states that the case was reported to him by relatives.

The account of Dr. Nevius' observations of demon-possession in China is very interesting. Two experienced missionaries of the China Inland Mission once narrated their experiences to me, and pointed out the danger of reaction on missionaries whenever evil spirits were dealt with by means of prayer and the name and power of Christ. China is referred to again and again in the paper. Is demon-possession as prevalent in other lands? Also, what explanation can be given that cases are rare in large cities?

A Christian stands in an advantageous position of tremendous significance. The Spirit of God dwells within him, and whilst he is uniformly attacked by the powers of evil, yet by "walking in the Spirit" he can overcome every form of evil. Moreover, the Christian may live with a clear understanding of spiritual things. "He that followeth Me shall not walk in darkness (said Christ), but shall have the light of life."

Mr. W. E. LESLIE said: The Scriptures give us authoritative accounts of various remarkable phenomena such as "tongues," demon-possession, and miracles of healing. Some would have us believe that they still occur to-day. We should not respond with sceptical unbelief nor with easy credulity. Rather is it our duty to examine such statements with the scrupulous care such important matters demand.

It will readily be agreed that, where present-day miracles of healing are claimed, it is proper to ask for medical testimony, for it is well known that the layman is often unable to distinguish

between grave disease and comparatively harmless conditions. But when we come to alleged cases of demon-possession there is a widespread impression that they are unmistakable. This is probably because cases presenting similar symptoms are not ordinarily met with. Nevertheless they exist. Dr. Knight seems to recognize this, for on p. 129 he speaks of obsessions (which he regards as for the most part harmless) developing into demoniacal somnambulism. Again, in the case mentioned by a Roman Catholic theologian on p. 128, the burning effect produced by an object blessed by a priest suggests rather the well-known hypnotic state in which actual blisters have been produced when patients have been touched by objects which they have been told were red-hot, rather than the presence of a demon.

Of the two alleged cases of post-Biblical possession given by Dr. Knight, one (p. 126) was recorded 100 years ago when pathological psychology was unknown. The other (p. 127) was reported by persons whose qualifications are not mentioned. Of the two collections of cases, that by Dr. Nevius was made between 60 and 70 years ago. The cases were mainly contributed by Chinese converts. Nevius admits that most missionaries in China in his day (before the advent of Modernism) were not prepared to express an opinion as to Chinese "possession," and that cases were observed almost exclusively by Chinese. He only saw one himself. The other collection is that by Oesterreich, in his very exhaustive book on this subject. But he professes to explain them all on psychological grounds. For the Biblical cases we have the authority of the Scriptures to guide us, but as to the others we cannot cite them as though their real nature had not been a matter of challenge.

Rev. A. BODY mentioned the barbarous and uncouth language that people used in talking about these things—*e.g.* auto-suggestion, a regular "tower-of-Babel" of a word, beginning in Greek, going into Latin, and finishing in English. Perhaps it is due to the fact that one has to express that which is almost too subtle to be expressed in words. There are others working on these questions, and have been for generations, and not unsuccessfully either—the African witch-doctors. Bishop Chauncey Maples, of Likoma, in U.M.C.A., said he was quite sure that, to a limited degree, the witch-doctors

could make rain ; they had got into touch with secrets of nature quite unknown to modern science.

Not a mere speculation, the subject is intensely practical. I have got my devil : what is to be done about it ? The Archbishop of Canterbury said once : " Every man has a wild beast within him, and he has to fight for his life against it. He must either kill it or be killed by it. I have got my devil. How can I kill it, that I be not killed of it ? "

Mr. GEORGE BREWER said : I am sure we are all much indebted to Dr. Knight for the scientific and detailed handling of this subject, and the evidence which he has given of modern demon-possession as proof of those cases recorded in the New Testament. When God made man in His own image, He protected him against the direct assault of the great adversary : Satan was only allowed to approach through the medium of an inferior creature. Even after the Fall we find protection still afforded ; by virtue of the great sacrifice foreshadowed in the Garden of Eden, Satan could obtain no power over man except as God allowed for testing purposes, as in the case of Job, and instanced by our Lord's words to Simon Peter : " Satan hath desired you, that he may sift you as wheat ; but I have prayed for thee, that thy faith fail not." In proportion as man fails in the test, and the human will is yielded to the allurements and delusions of the evil one, so is man brought into further bondage both mentally and morally.

With regard to the claims made by Modern Spiritists of having communion with departed spirits, there is only one record in the Old Testament of any such intercourse—that of Saul in consulting the witch of Endor, when God allowed the prophet Samuel to appear in order to pronounce judgment upon Saul on account of his disobedience ; and in the New Testament we have but one instance recorded of a desire for such intercourse, when Dives appealed to Abraham to send Lazarus to his father's house to warn his five brethren. The answer was that if the warnings of Moses and the prophets were not sufficient to deter them from their sinful course, they would not be persuaded though one rose from the dead.

The Scripture of Truth which God has given to us is sufficient for all man's spiritual needs, and no provision is made for intercourse

with departed spirits ; but many are the warnings against seeking to open such communication. If the Scripture is neglected, and its warnings ignored, man lays himself open to every delusion of Satan, and the habitual yielding of the will to him may result in Satanic domination over mind and body. The tremendous forces of evil arrayed against us—principalities, powers, and world-rulers of darkness under the sway of our arch-adversary—would indeed be appalling, were it not for the knowledge that our Lord Jesus Christ has destroyed Satan's dominion and delivered us from his power ; so that, in all our conflicts, we can be more than conquerors through Him that loved us. The God of peace Himself will bruise Satan under our feet shortly.

Mr. F. C. WOOD said : Some time since I read Dr. Nevius' book, which has been referred to and quoted from, and from that time I have never doubted the fact of "demon-possession." I found that it threw great light on many things in the New Testament connected with this subject. I should not, however, venture to take part in the discussion, were it not for the paragraph at the bottom of p. 132, where, going beyond the question of "demon-possession," it is implied—and more than implied—that the disembodied soul or spirit is in a restless and unsatisfied state, seeking to acquire knowledge, and often to take possession of animals, also to obsess or possess man. This seems to me very much akin to the transmigration of souls, and to be a remarkable statement, and I shall be glad to know how it can be supported by Scripture ? Beyond what we read in Luke xvi, I do not know that we are told anything of the present position and condition of the unconverted dead. On the other hand, regarding those who have been born of God, the teaching seems to be very clear, that they are "absent from the body, and present with the Lord."

I believe that communications from those who have died are always from impersonating "wicked spirits," whose object is to deceive and seduce, and who, through a course of ages have obtained a marvellous knowledge of things, so that they can deceive the most astute and scientific mind. I cannot conceive of a believer in Christ, who has been redeemed unto "life eternal," whose "life is hid with Christ in God," and who is part of "the body of Christ"—even stated to be "seated in the heavenlies in Christ"—having his

spirit or soul roaming about after death in an unsatisfied state, and communicating with people on the earth. The only case recorded in Scripture of God permitting one of His people to return to earth, to speak with a human being, is that of Samuel appearing to Saul, and that was evidently allowed for very solemn reasons. Samuel not only manifestly appeared, but conversed with and reproved the king, and prophesied his overthrow and death. Even Samuel (in an age when the promises concerning Christ had yet to be fulfilled) spake to Saul as one that was at complete rest, and said : " Why hast thou disquieted me to bring me up ? " I know of no Scripture indicating that the soul or spirit is left at death in the condition indicated on p. 132 of the paper. If they are, then the prospect after death until the resurrection would be strange indeed, and not such as the teaching of the New Testament indicates, and to which the great multitude of Christians have always looked forward.

WRITTEN COMMUNICATION.

From Prof. W. MACNEILE DIXON, M.A., Litt.D., LL.D., of Glasgow University, President of the Scottish Society for Psychical Research : I have read Dr. Knight's admirable paper, and thank him for the same. It is, I venture to think, most valuable and instructive—indeed, the best thing on the subject I have seen. I wish the paper could have the widest possible circulation, not only among spiritualists, but also among their opponents—I am not sure which side is the more in need of its knowledge and wisdom. I shall keep the paper by me for re-reading and reference, and meanwhile I offer my warmest congratulations to the lecturer for so important a contribution to a subject of the deepest interest.

LECTURER'S REPLY.

To Mr. Collett—The word " wholly " (p. 120) was intended in a geographical rather than a quantitative sense, and based on 1 John v, 19, " the whole world lieth in the wicked one," as his sphere of influence. I have modified the phrase so as to remove any ambiguity. The amendment on p. 122 is quite pertinent. I was thinking rather of Eph. ii, 2, " the spirit that now worketh in the children of disobedience." The last paragraph on p. 132 is a summary

of pagan beliefs, ancient and modern, on the subject of the disembodied spirit, and it seems to be borne out by psychical research.

To Mr. Ruoff—I should like to believe that the human race as a whole was ruled by reason and common sense: we ought to be, but . . . The connection of angels with health and disease is a side issue, but the following references are suggestive: Plagues of Egypt, Ps. lxxviii, 49; Plague at Jerusalem, 2 Sam. xxiv, 16; Sennacherib, 2 Chron. xxxii, 21; Elijah, 1 Kings xix, 5; the Temptation, Matt. iv, 11; Bethesda, John v, 4; in Gethsemane (“angel of the agony”), Luke xxii, 43; death of Herod, Acts xii, 23. For physical phenomena, see Ps. lxxviii, 17, for Sinai; Gen. xix, 1, for Sodom and Gomorrah; Rev. viii, *sqq.*, for the last plagues; also Heb. i, 7 (Ps. civ, 4).

The case reported on p. 127 is quite authentic, and the witnesses exceptionally competent. A similar case was reported to me at the close of the meeting, and from one of the members of the S.P.R. in Glasgow I heard of a milder case of possession and its cure this very month. Cases could be multiplied indefinitely from other heathen lands, notably Japan (*see* Mrs. Howard Taylor’s books), West Africa, South Africa, Livingstonia, and, indeed, all over the missionary world. They are somewhat rare in Christianized countries, because the policy of the devil there is clearly imitation, appearing as an angel of light.

To Mr. Wood—Transmigration of souls is a purely human attempt to hold the balance level, and work in compensation into a general scheme of rewards and punishments. It is at the basis of Hinduism and Theosophy with their doctrine of *Karma*, and has no place in Scripture or in the Christian religion. See reply to Mr. Collett.

To Mr. Leslie—I have quoted Nevius because of his valuable summary (pp. 130, 138), but all these symptoms have been observed within the last twenty years. Oesterreich’s data are authentic, but his explanations on psychological lines do not meet the case, and, indeed, involve the splitting of an individual, really a survival of nineteenth-century materialism, regarding consciousness as a form, though a very fine form, of matter. On this point hear Basil Mathews: “Some modern scientific psychologists see no other possible explanation of ‘multiple personality,’ as it is sometimes called, than that of real ‘possession’ by some spirit.” (*A Life of Jesus*, Oxf. Univ. Press, 1931, p. 462.)

744TH ORDINARY GENERAL MEETING,

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL
WESTMINSTER, S.W.1, ON MONDAY, MARCH 16TH, 1931,

AT 4.30 P.M.

LIEUT.-COL. T. C. SKINNER, F.R.Met.Soc. (LATE R.E.), IN
THE CHAIR.

The Minutes of the previous Meeting were read, confirmed, and signed, and the HON. SECRETARY announced the election of the following:—As Associates: The Rev. Russell B. White, M.A., James Payne, Esq., and B. W. Leefe, Esq.

The CHAIRMAN, explaining with regret the author's inability to be present owing to distance, invited Lieut.-Col. J. H. Murray, R.E. (ret.), to read Colonel Molesworth's paper on "The History of Practical Astronomy."

HISTORY OF PRACTICAL ASTRONOMY.

By COLONEL F. C. MOLESWORTH (LATE R.E.), F.R.A.S.

THE object of this lecture is to recite briefly how the modern practical uses of astronomy grew out of the observations of the ancients.

I think one may say with tolerable certainty that man's first deliberate astronomical observation was that of the sun, in order to ascertain how the day was passing. This is obvious enough; the hunter wanted to know whether it was time to set out for a distant hunting-ground; the cultivator wanted to know whether it was time to cease work and start for home; the servant "earnestly desired the shadow." One and all would make use of the shadows of natural objects—trees or distant hills.

But in featureless countries, some artificial arrangement would be found necessary, and so the first sun-dial would be invented. With it would come the desirability of dividing the day into equal parts. When and by whom this was first effected is now difficult to say. In Old Testament times, the only subdivision of the day or night is the "watch," at first a third, and then a fourth, of the twelve hours. The expression "hour" in the book of Daniel is a translation of the Chaldean *sha'ah*, meaning an instant of time.

The Babylonians had, however, a subdivision known as *kasbu*, a twelfth of a solar day, or two hours. Whether they were the originators of this measurement cannot be said, but by the first century A.D., a reckoning in hours as we know them had spread over the then civilized world. "Are there not twelve hours in the day?"

The first portable sun-dial, as distinct from the gnomon, is said to have been invented by Berosus, the Babylonian astronomer, about 340 B.C. It would take too long to trace the history of the sun-dial, even briefly; it was early confronted by serious rivals, such as the water-clock; it could not tell the time at night, or on a cloudy day. It took no account of the "equation of time" and so might be as much as 16 minutes out in its reckoning. So, naturally, the invention of modern clocks and watches relegated it to the toy department. In its time, however, it served a useful purpose.

Turning now to man's first lunar observations, it is commonly supposed that the lunar calendar preceded the solar. In the nomadic and pastoral stages of his existence, the changes of the moon would make a greater impression on man's senses than the much slower changes in the altitude of the sun and the variation in its heat. Full moon facilitated his hunting operations, the nocturnal movement of his flocks and herds, the guarding of his camp, and so on. Particularly would this be the case in lower latitudes, where the difference in the seasons is not so marked as in the North. Primitive peoples still talk of an event having happened so many moons ago.

The month began, by general though not universal consent, with the first appearance of the crescent moon in the evening sky, as it does in Mussulman countries to this day. The inconvenience of this arrangement is obvious. To take an example, Ramadhan, the month of fasting, ends with the appearance of the new moon of the following month. It cannot be predicted

with absolute accuracy on which of two successive evenings this will occur. The day following the appearance of the moon is a holiday. It cannot therefore be foretold until late the previous evening, which day will be a holiday. Imagine similar uncertainty regarding the date of our August Bank Holiday! The custom is, however, based on the Qur'an, and so is not likely to alter.

* * * *

The technical expression for the period occupied by the moon in undergoing its changes is known as a "lunation."

Bad weather conditions, even in better climates than our own, may defer the appearance of a new moon until it is two or three days old, with further inconvenience to the calendar. Thus, we read of a total eclipse of the sun taking place at Babylon on the 26th day of Sivan; in other words, the new moon that month could not have been visible until it was three days old. The eclipse has been identified with that of July 31st, 1053 B.C.

The actual sighting of the new moon became, therefore, an observation of great importance. In Babylonia it was associated with moon-worship. In Israel it was a day of festival.

The Sanhedrim used to sit in the Hall of Polished Stones to receive the evidence of credible witnesses that they had seen the new moon. They then decided whether the month just ended was to be of 30 days or "perfect," or of 29 days and "imperfect."

The Assyrians, long before this time, had an ingenious arrangement by which they predicted, from the relative positions of the sun and moon, when the next new moon would be visible.

In Muhammadan countries, the new moon at the end of Ramadhan is eagerly looked for by amateur astronomers on every hillock, roof, or minaret. The telegraph has, of course, made this a work of supererogation, since the moon's appearance in one place is wired all over the country, and the devout Mussulman is nowhere enjoined that his observation need be personal.

The month and the day are not commensurable; the average duration of a lunation is 29 days 12 hours 44 minutes and 3 seconds and a fraction. If therefore the months were made alternately 29 and 30 days in length, a working arrangement could be made which need not depend on actual observations; such an arrangement could persist for a generation without being seriously in conflict with theory. The Romans had an arrange-

ment of this kind, and it is from this that our calendar, with its varying number of days in a month, is derived.

Some subdivision of the month must very soon have been seen to be necessary, and it is commonly, but I think erroneously, supposed that the week was the result of dividing the month into quarters. Four weeks of seven days each still leave more than a day and a half to be accounted for, and, as far back as records go, there is no trace of an intercalary day or days in the month.

The Romans divided the month in a way which seems curiously unpractical for such a practical race ; about the beginning of the Christian era they adopted the week of seven days, an institution of Hebrew, and most of us will agree, of Divine origin. It is noteworthy, however, that the expression "week," where first used in the Authorised Version of the English Bible, refers to a period of seven years (Gen. xxix, 27), although the collective "seven days" occurs frequently before that passage.

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It is not to be assumed that the year is not also a very ancient measure of time. We find the year in use as a measure as far back as records go ; the ages of the patriarchs in Gen. v, are given in years, and the juxtaposition of the terms year, month, and day, with approximately their relative values, in the Biblical account of the Flood, to which we shall refer later, precludes us from regarding them as anything other than what we regard them as now. In this connection it is noteworthy that Josephus (*Ant.* I, i, 3) states that "those that lived then noted down with great accuracy both the births and deaths of illustrious men."

It must have been discovered very early in history that the month and the year were not commensurable ; about $12\frac{1}{2}$ months go to the year. This incommensurability has given rise to the principal calendars in use, *viz.*, the solar, luni-solar, and lunar.

The measurement of time by lunar years, still in force in Mussulman countries, suffers from the disadvantage that it is impossible to use it as a guide for the sowing of crops and other agricultural and pastoral activities. Each year begins ten days earlier in the season than its predecessor. Agricultural nations, if they ever used it, soon gave it up for a solar year.

Here it may be mentioned that in some Muhammadan countries—Persia, for example—a solar calendar lies submerged

beneath a lunar one. The *Nau Ruz*, or New Year's day, occurs there at the vernal equinox, whatever the month or day of the month may be.

In a luni-solar calendar the lunation and the solar year are both in use, an intercalary month at different periods effecting adjustment. A thirteenth month to the year becomes necessary every third year or so. The Jews adopted an intercalary month *Ve-Adar*.

The narrative of the Flood throws considerable light on the calendar in use in early times. A very remarkable series of dates occurs in *Gen. vii and viii* :—

- vii, 11. 600th year, 2nd month, 17th day. Flood begins.
- vii, 12. 40 days rain.
- vii, 24 (included in 150 days flood).
- viii, 4. 7th month, 17th day. Ark rests.
- viii, 5. 10th month, 1st day. Tops of mountains seen.
- viii, 6. 40 days. Raven and dove sent out.
- viii, 10. 7 days. Dove sent out.
- viii, 12. 7 days. Dove sent out for last time.
- viii, 13. 601st year, 1st month, 1st day. Waters dried up.
- viii, 14. 601st year, 2nd month, 27th day. Earth dried up.

There are certain noticeable points in the above : Firstly, it is almost impossible to resist the conclusion that Noah kept a log. Five specific dates are mentioned, as well as five periods of time varying from seven days to 150 days. Such exact dating does not again recur in the Bible for over 1,000 years, until the Exodus. Secondly, the period of 150 days is mentioned as equivalent to five months. It is not therefore to be assumed that the month was then fixed at thirty days ; with stormy skies dead reckoning would no doubt be employed, and the month calculated irrespective of the appearance of the new moon. Thirdly, the total duration of the Flood is 365 days, or a solar year, but whether this is anything more than coincidence is doubtful. Fourthly, the months had not yet been named, or, if named, the system of recognition by ordinals was in more common use. But if, with Josephus, we assume that the months of the years of Noah's life coincided with those of the calendar year, the date of the stranding of the Ark would have been the 17th of Nisan, consequently very close to our Easter day.

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The Jewish calendar year was 355 days in length, with a leap year of 385 days every third year. At what period in Jewish history this calendar was adopted is uncertain but the calendar in use at the Exodus persists to this day, with the one alteration that the first month, originally Nisan (Exod. xii, 2) was changed in the second century A.D. to Tishri, formerly the seventh month of the year. With such an arrangement it would be found in a short time that a leap year every third year was slightly inaccurate, and that seven leap years in every nineteen was a better guide.

The question would always arise as to when to insert the intercalary year. The Hebrews solved the question by watching the progress of the growing grain. To quote Maunder (*Astronomy of the Bible*, p. 307): "If at one new moon in spring time it appeared clear that some of the barley would be ready in a fortnight for the offering of the green ears at the feast of unleavened bread, then it was taken as beginning the new year. If it appeared doubtful if it would be ready, or certain that it would not be, then the next new moon was waited for."

Among the Babylonians, another method of fixing the beginning of the year was in use, the simplicity as well as the accuracy of which we cannot fail to admire. The heliacal rising of certain stars was observed, that is to say, the first time in the year that a star was visible in the brightening twilight. In clear skies this would give a very exact method of determining the length of the solar year. Such observations naturally associated certain constellations with the weather. Thus the Pleiades became associated with rain. The heliacal rising of the Pleiades at the time when the constellations were designed took place in April, and it has been suggested that the "sweet influences" referred to in Job typified the return of spring. In our own country we talk of the dog-days, *i.e.* the period in July and August when the dog-star, Sirius, rises and sets with the sun.

* * * *

In a solar calendar the month loses its connection with a lunation and becomes an arbitrary division of time. The Egyptians seem to have been the first to invent a purely solar calendar. They abandoned the use of the moon as a time measurer, and fixed the length of the year at 365 days, divided into twelve months of thirty days each plus five holidays. There

was no arrangement for accounting for the six odd hours by which the solar year exceeds 365 days. Consequently, the beginning of the year worked backwards through the seasons, until, after the lapse of 1,460 years, it returned to its original starting-point. We know that this occurred in A.D. 139, and it is assumed that this date represented the conclusion of the second, or it may have been of the third, cycle, since the invention of that calendar. This would place the latter event in 2781, or it might be in 4241 B.C.

In the second century B.C., Hipparchus placed the length of the solar year at 365 days, 5 hours, and 55 minutes. Considering that he was, of course, entirely without optical aid, his discovery is of remarkable accuracy. It was on this figure that Julius Cæsar based his calendar reform, adopting the leap-year, the suggestion of one Sosigenes. With one modification due to Pope Gregory VII, this calendar has persisted to the present day. Pope Gregory's arrangement of omitting leap-years at the close of all centuries, except those where the first two figures of the year are divisible by four, will hold good up to the year 3200, which, to be as accurate as possible, should also be a leap-year; but we need not worry about that now.

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We owe to the Babylonians the discovery of the periodicity of eclipses; they found out that eclipses recurred at intervals of 18 years and 11 days (a period known as the Saros). This discovery implies a long record of carefully recorded observations. The Babylonians were at first, at any rate, far from deducing the actual cause of an eclipse, much less from finding a reason for their periodicity; but the discovery of the Saros marked a milestone in human history, for the terror which a total solar eclipse caused would give way to different feelings once it was found to be a periodic and predictable phenomenon.

In giving credit to the Babylonians for this discovery, it should be mentioned that it is quite possible that the Chinese had long anticipated them. At any rate, in the third millennium B.C., an imperial edict ordered that "whether the instant of the occurrence of any celestial phenomenon was erroneously assigned, or the phenomenon itself not seen and predicted, either negligence should be punishable with death." The occasion of this sanguinary law is said to have been the total eclipse of the sun of 2127 B.C., when the two court astronomers, Ho and Hi.

were found to be drunk and incapable at the time, and were put to death. Since then, as a distinguished astronomer has said, astronomers have made a point of being sober on occasions of eclipses.

The Greeks learned of the periodic law of eclipses from Babylon. Thales foretold the eclipse of 585 B.C. At what period it was discovered that it was the moon which caused a solar eclipse is doubtful. It would, one would think, be discovered very early in a country where a lunar calendar was in force, that solar eclipses occurred only just before the new moon appeared, yet comparatively late in Babylonian history there is a table showing omens to be drawn from the appearance of a solar eclipse on every day of the month, from the first to the thirtieth.

We have seen that the gnomon was probably the first astronomical instrument; it was put to other uses than that of measuring time. It was found that the length of the shadow of a gnomon at the same hour on the same day of the year varied in different places. Pytheas, in the fourth century B.C., was the first to try to measure latitudes in this way, though without much success; he calculated that Marseilles and Byzantium were on the same parallel of latitude, although in reality they are $2\frac{1}{4}$ degrees apart.

* * * *

To digress somewhat, it is usually assumed that the sphericity of the earth was deduced comparatively late in history; in fact, I have seen it asserted that the great objection on the part of the fathers of the Church to Columbus's enterprise was that he would suddenly find himself on the edge. The truth is far otherwise. A traveller moving north would notice the Pole Star, or what passed as the Pole Star, rising higher and higher each night. This could only happen, he would reflect, if the surface on which he were moving were curved. If it were curved in a north and south direction, it was reasonable to assume that it was curved east and west too, and hence a spherical, or approximately spherical, world would be deduced. I have laboured the point at some length, because it is often assumed that in talking of "the circle of the earth," Isaiah was referring to knowledge gained directly by Divine revelation. The probability is that man had, long before that time, found out that the earth was round. Assumptions of this kind discredit both religion and science.

Eratosthenes, 276 to 194 B.C., was more successful than Pytheas. He discovered that at Aswan in Egypt on Midsummer Day the sun at noon cast a vertical shadow. He also found that at Alexandria, 5,000 stadia almost due north, the sun cast a shadow approximately one-ninth of the height of the object, at the same time of day on the same date. He argued that the angle subtended at the earth's centre by the arc must therefore be equal to this angle, which for the sake of simplicity we may call $7^{\circ} 12'$. The circumference of the globe must therefore be $360/7\frac{1}{3}$ times 5,000 or, say, 250,000 stadia. Taking the value of the stadion as 582 feet, we obtain the value of the earth's circumference as 27,750 miles, a remarkably good approximation considering the means employed. Eratosthenes might have applied, but apparently did not apply, his latitudes to the making of maps, for a tolerably accurate map can be constructed from the data he gives. Maps had, of course, been invented before his time, but the credit for using latitudes as fixed points on a map must apparently be given to Strabo, who used the latitudes and longitudes worked out by Eratosthenes and Hipparchus.

Latitude finding by altitudes of the sun is, as you know, one of the methods of finding latitudes at the present day. Elaboration of methods has, of course, resulted in greater accuracy, and now it is possible to fix the co-ordinates of an observatory within a fraction of a section of arc. Stellar observations give rather more accurate results than solar; man goes to the stars, billions of miles away, to measure the length of a tiny piece of his minute world.

* * * *

Another use made of the stars in very early times was for direction finding. The name given by the Greeks to the Pole Star was Cynosura, or the dog's tail. From the metaphorical use they made of the term, which has descended to us in the form "cynosure," we infer that they treated it as the Pole Star, although it was, in their time, distant some degrees from the Pole. With the recognition of this began the fearless navigation of the seas, instead of cautious voyages never out of sight of land.

In the Great Pyramid and in Stonehenge and other stone circles scattered about Celtic countries, we find undoubted use made of the sun and stars for orientation, at an epoch preceding by at least two millennia that of Greek science. Unfortunately,

no record has come down to us as to why certain stars were selected, although conjectures are numerous. No doubt the position of a heavenly body at a particular time would be noted and fixed by templates, which would be replaced by permanent structures which would be available for the ceremony, whatever it was, on the corresponding day of the following year.

A development of this must have been the use of the sun and stars for direction finding. Every scout knows how to use the sun as a compass. The use of the stars for the same purpose is more intricate. No star stays in the same position long enough for us to use it as a direction post for more than a few minutes. Even the Pole Star describes a small circle round the true pole. If we were to start this evening on a twenty-mile march, using the Pole Star as a guide, we would deviate nearly 1,300 yards from our course. With other stars the error would be greatly exaggerated. In marching by the stars, it is necessary to halt every few minutes to realign oneself on a fresh star.

From these beginnings develops the use of the sun and stars for determining azimuths, *i.e.* the true bearings of distant objects.

Having found out the size and shape of the earth, man naturally began to attempt the problem of the distances of the moon and sun. The Greeks devoted time and trouble to the problem. Hipparchus came to the conclusion that the moon was distant from the earth not less than 67 nor more than 78 semi-diameters of the earth. As a matter of fact, the distance varies between 56 and 64 semi-diameters of the earth, so that Hipparchus was very near the truth. The problem of the sun's distance presented greater difficulties, but a result of about one-third of its actual value, which is what was obtained, must be considered very creditable with the instruments then extant.

I do not mean to infer that the Greeks had that in their minds when they began to calculate the distance of the moon. But the great genius of the Greeks lay in their pursuit of knowledge for its own sake. Theirs was the patient collection and recording of observations of which subsequent generations were to make use. It is true that they often made guesses which were not warranted by the extent of the data they possessed, but we are all liable to do that.

At a certain period in their history, however, the Greek mind seemed to tire. Aristotle wrote down all he knew, and most of his successors seemed to think that that was all there was to

know. Ptolemy stereotyped the astronomy of the day, and in doing so sinned against the light, for he taught an immovable earth and a fixed heaven, though Aristarchus, centuries before, had taught the opposite. The doctrines of Aristotle and Ptolemy became, unfortunately, an article of belief in the Christian Church.

* * * *

The Greek mind deteriorated and plunged into astrology, a blind alley which leads nowhere. It is usually thought that astrology was the forerunner of astronomy; the reverse is probably the case. To quote Maunder again (*Astronomy of the Bible*, pp. 139, 140): "There is a widespread notion that early astronomy, whether among the Hebrews or elsewhere, took the form of astrology; that the fortune-telling came first, and the legitimate science grew out of it. Indeed, a claim is not infrequently made that no small honour is due to the early astrologers, since from their efforts the most majestic of all the sciences is said to have arisen.

"These ideas are the exact contrary of the truth. Mathematical, or perhaps as we might better call it, planetary, astrology as we have it to-day, concerns itself with the apparent movements of the planets in the sense that it uses them as its material; just as a child playing in a library might use the books as building blocks, piling, it may be, a book of sermons on a history, and a novel on a mathematical treatise. Astrology does not contribute, has not contributed, a single observation, a single demonstration to astronomy. It owes to astronomy all that it knows of mathematical processes and planetary positions."

The Romans, as the intellectual as well as the political heirs of the Greeks, were above all practical people, and made practical use of the astronomy they borrowed from Greece, taking, for instance, and probably developing, the art of fixing seasons for sowing, etc., by the heliacal rising of certain stars. But, as practical people, they had no use for recondite theories, which seemed to lead nowhere.

On the downfall of the Roman Empire, science slumbered until the Arabian revival, centred round Baghdad, about 1000 A.D. Then came another sleep, until the Renaissance, which brought to light the forgotten Greek knowledge. Thus scientifically we are the heirs, through the Greeks, of the Egyptians and Babylonians, and no doubt, to a very slight extent, of other

countries. The Chinese, Mexicans and other ancient peoples no doubt knew a lot, but their knowledge died with'them, and they have left no intellectual descendants.

One of the most important adaptations of modern science, already alluded to, is the forecasting of the tides. This is, almost entirely, a modern development, although the connection between the moon and the tides was known in classical times. The culmination of modern research in this direction may be said to be the tide-predicting machine of Sir W. Thomson, afterwards Lord Kelvin. The height of the tide for the place for which the machine is designed can be predicted for any hour of any day years ahead.

There are only a few recorded observations of sun-spots before the days of Galileo, but a great deal of time and labour is now spent by astronomers on their observation. At certain periods spots are almost entirely absent from the solar surface ; at others, spots will cover a considerable portion, sometimes as much as 1·5 per cent. of the visible hemisphere. Such maxima occur fairly regularly at intervals of about 11·3 years, minima preceding such maxima by rather less than half this interval, *i.e.* rises to activity are rapid and declines slower.

* * * *

It is natural to try and connect such activity with our terrestrial weather ; perhaps the wish was father to the thought. At any rate, about 1850 there was a general agreement that minimum spot years were wet and stormy and maximum years dry. The records of Indian monsoons were examined, and it was supposed that an 11-year fluctuation in the price of food grains had been discovered.

The accumulation of further data, both astronomical and meteorological, led to this theory, at any rate in its obvious form, being discarded. But a remarkable agreement has been traced between sun-spots and magnetic storms. Spencer Jones, in *General Astronomy*, p. 126, says : " When sun-spots are numerous, magnetic storms are relatively frequent ; when sun-spots are few in number, the storms are rare. The connection between them was pointed out by Maunder, who examined nineteen magnetic storms between 1875 and 1903. These storms, in general, showed a sudden commencement, and in every case there was a large spot near the central meridian of the sun. Further, Maunder showed that magnetic storms frequently

recur after an interval of about 27·3 days, and this is the period of the sun's synodic revolution. If a spot is on the central meridian at a certain date, it will again be on that meridian after the lapse of 27·3 days, and will then be in a position to cause another storm. It must be emphasized, however, that the presence of a large spot on the sun is not necessarily an indication that a magnetic storm will ensue."

Whether magnetic storms have an effect on our terrestrial weather is a point on which meteorologists are better qualified to speak. The following extract from the *Meteorological Glossary* has been given me by a member of the Institute: "The amplitude of the regular diurnal changes in terrestrial magnetism, even on quiet days free from magnetic storms, is increased at the epochs of high sun-spot numbers . . . One of the most striking relations is the correlation between the sun-spot number and the variation of level of the water in Lake Victoria at Port Florence. In this case the correlation coefficient is +·8."

The cause of the periodicity of sun-spots is unknown; serious attempts have been made to connect the actual appearance of spots with the configurations of the planets. It has been stated that the conjunction of two planets, with regard to the sun, is the trigger effect which produces the actual spots. Should these assumptions prove correct, we should have a direct connection between the movements of the planets and our weather, presuming that it is possible to disentangle the solar effect from the much greater terrestrial effects.

The patient, laborious and careful collection of astronomical data, often in utter ignorance of whither they lead, has often led to the most unexpected but most practical results. As Sir James Jeans has put it: "In astronomy nothing succeeds so ill as the frontal attack." Such indirect results go a long way toward recompensing astronomers for the drudgery of recording and tabulating observations, made, not in the hope of immediate gain, but with the object of adding to the sum of human knowledge.

DISCUSSION.

The CHAIRMAN (Lieut.-Col. Skinner) said: A friend who had attended a meeting of the Victoria Institute and had read a number of our papers asked me recently why it was that so many colonels

seemed always to take part in the discussions? The only reply I could make on the spur of the moment was that we were all retired and had nothing else to do!

Well, that sufficed for the moment; but, having heard Colonel Molesworth's paper, I think you will agree with me that, not indeed out of any enforced idleness, but out of his rich treasury of the mind, he has brought to us things new and old, a fine contribution, bearing even in the simplicity of its diction a hall-mark of genius.

I trust, therefore, that the rest of us, be we colonels or non-combatants, will take heart of grace, and give Colonel Molesworth's paper the discussion that it merits and himself the thanks he deserves. I will confine my own remarks to a few comments and an illustration of one of Colonel Molesworth's points.

At the foot of p. 160 is cited Isaiah's allusion to "the circle of the earth" and the assumption of some that he had gained his knowledge of the earth's sphericity by Divine revelation. While I agree with the author in thinking it probable that the sphericity was at least suspected long before Isaiah's day, I think we should be slow to affirm that Isaiah may not have had even a fact of science disclosed to him by revelation. Does not God speak often to man in a dream, in a vision of the night? Else how should we explain the marvellous panorama of Creation in the first chapter of Genesis in so near accord with the sequence disclosed by modern science? But an even simpler explanation offers, it seems to me, in the fact that wherever man goes, whether on land or on sea, he is surrounded by the wide circle of the horizon. Need any one, therefore, strain the allusion beyond that point? On p. 163 we are informed that *Astrology* was never the parent of *Astronomy*, but rather a parasite growth. I thank the author for bringing out that important point so clearly.

Now for an illustration. Emerson has advised us to "hitch our wagon to a star," but as a matter of fact, each of us, even the most unlearned, may really be more of a practical astronomer than he or she ever suspects. A soldier's yarn will serve to illustrate my point. It was in France during the War. The scene was set in a small, untidy French village at the edge of a darksome wood. The roads were quagmires, with mud and slush everywhere. Billets were in the roughest of barns and

outhouses, illumined by about one tallow dip per platoon. Into this scene of desolation was shot one night a "reinforcement," to wit, one solitary old fellow who had never been out of England in his life before, and home-sickness was paramount. Faithful to his devoted wife at home, he penned a loving epistle, and this is what passed the censor—in the midst of a dismal lament this one gem of practical astronomy—"If it wasn't for the blinkin' old moon, Martha, I wouldn't know it was the same blinkin' earth." His adjective was a little more rugged than my translation of the same, but he had got his bearings all right, and his wagon was hitched.

We have listened to a most interesting paper, have we not? and one that, I feel sure, you will support me in saying, is of permanent value. Join with me, therefore, in the expression of a hope that it may be but the first of many papers from Colonel Molesworth, and signify appreciation by your hearty response.

The usual vote of thanks was heartily accorded.

DR. NORMAN S. DENHAM said: In thanking Colonel Molesworth for his very able summary of a vast subject, I cordially agree that the prime value of astronomy for practical purposes is for the measurement of time. Astronomers are aware that the day, week, month and year are incommensurate. The search for solar and lunar cycles to correlate these measures has occupied mankind from the dawn of history. The problem has found no solution with respect to a permanent solar or luni-solar calendar because of the inevitable epacts.

It is extraordinary, in view of Gen. v, 5, that no one has attempted to suggest how Adam, correctly recording his days, could so total them as to afford posterity the precise total of the years of his life—a total, if we accept implicitly the Divine record, we take as scientifically accurate. Are we entitled to regard these years as "lunar," "solar," or "sidereal," as to their ultimate value, on no greater authority than conjecture?

I would ask Colonel Molesworth if he is justified, on p. 156, in asserting that the Exodus Calendar persists to this day. If reference be made to Rev. S. B. Burnaby's standard work on *The Elements of the Jewish Calendar*, it will be seen that the present Jewish Calendar differs greatly in its incidence from that which orthodoxy deems

to have been used in Biblical times. The fact is, that little or no knowledge of the Exodus Calendar, let alone Adam's Calendar, exists, save that the months were lunar.

In the same paragraph the lecturer states that there is no historical "trace of an intercalary day or days in the month." When examining this problem, by following the hint given by the late Dr. Martin Anstey at p. 252 of his *Romance of Bible Chronology*, I deduced that the expression "in process of time" (rather "at the end of days") of Gen. iv, 3, indicated either the intercalary month or the close of a regular three-year intercalary cycle, which itself was identical with the three-year tithing period (Deut. xxvi, 12). We have three other occurrences in the Pentateuch, namely, Gen. xiv, 20 (A.H. 2091); Gen. xli, 1 (A.H. 2289); and Exod. ii, 23 (A.H. 2511). All these were the third years of a regular sequence of three-year cycles from Adam's first year, A.H. 1.

We may reverently consider whether Adam was divinely instructed from the outset as to the proper method of intercalation. Assuming his months and years were normally lunar, he could not have continued a consistent three-year intercalation for 930 years, and have kept true solar time. The embolismic month must have varied spasmodically from time to time. In such case, it is hopeless for us to attempt to check the patriarchal years. But were those years necessarily solar? I think not. At Exod. xii, 40, we read that 430 years after Abram's exodus from Haran, "on the *self-same day* all the hosts of the LORD went out from the land of Egypt." As accepted by all the best authorities, including Archbishop Ussher, Abram was 75 in A.H. 2083 (Gen. xii, 4). The Exodus year, 430 years inclusive from 2083, was A.H. 2512, the seventh month of which became the first month of A.H. 2513. "Self-same" means "anniversary" or "repetition," so we may infer that Israel left Egypt on the same day of the week and month as Abram left Haran. A *fixed calendar* at once suggests itself. Self-same dating in two years 39 years apart was discovered earlier in connection with the wanderings, so that the cycle of 39 was indicated. When 2083 and 2512 are divided by 39, the remainder in each case is the same, namely, 16. Immediately an amazingly simple but profoundly significant coincidence appears. Israel left Egypt on Wednesday, 14th Nisan, on the *self-same calendar day* of the age-long 39-year

cycle in which Abram had left Haran eleven cycles before ; and it may be added that on that *self-same* Wednesday, 14th Nisan, long years after, our adorable Lord and Master suffered His Exodus upon the Cross (*cp.* Luke ix, 31—"decease" means *exodus*).

If we examine the 39 years, taking them as sidereal, not solar years, we find that they total almost precisely 14,245 days. The total is exactly divisible by 7. Thus this cycle affords perfect commensuration for the passage of days, weeks and years, together with a unique basis for a fixed calendar, founded on basic time, for solar time is not really basic, but a mean only. A solar cycle of 39 years does not afford this exactitude and is useless for calendrical purposes. A lunar calendar based on this cycle would remain good for nearly 18,000 years without gaining one day on basic time.

One other point emerges. Rev. F. A. Jones, writing in 1909 on "The Dates of Genesis," shows that the ancient Egyptian year reckoning was sidereal, and he made the significant statement that "we have yet to learn the testimony of the stars to the chronology of the world." This prophecy receives confirmation by facts relative to the Great Pyramid at Ghizeh. Taking the measurements of Professor Sir Flinders Petrie, we find that its base structural circuit measures 36525.64 pyramid inches. This measurement, on the scale of 100 pyramid inches to a day, represents a good value of the sidereal year, and is actually only 8.6 seconds of time longer than the value for the present period. If the Egyptians had, in about 2170 B.C., embodied this knowledge in their imperishable monument, it is but a normal inference that such knowledge was even then ancient.

It is more than conceivable, it seems to me probable, that Adam was instructed by God Himself as to the simple intercalation of his lunar calendar at the close of every three years, to accord with sidereal time. Adam was thus enabled to keep perfect time records apart from any elaborate series of observations which might enable him at length to decide, even if he were competent, on the nicety of those "mean times" which are only now accepted as the basis of chronological computation.

Mr. G. WILSON HEATH wrote : The paper emphasizes the difficulty which I raised in the paper read to us by Colonel A. C. H. Kenney-Herbert last year as to the fixing of the 14th Nisan by astro-

nomical observations, and especially by observing the time and date when the thin crescent of the new moon first became visible above the horizon. Atmospheric conditions would altogether mar the accuracy of such calculations, as I stated, and as the paper we have just listened to again and again indicates.

One can easily imagine that a sundial, in some crude form or other, would be the earliest mechanical method of measuring time. But a more elaborate and really wonderful instrument, and one which in its developed form was in use until quite recent years, was "The Astrolabe" or "The Planispheric Astrolabe." This instrument in its conception and initial stages was worked out by Appolonius of Perga in 240 B.C., and put to serious use by Hipparchus in 150 B.C.

Professor Jenkins, of Oxford, declared quite recently that it was "a useful educational scientific instrument with a history of 2,000 years, and the oldest scientific instrument known." It certainly has played an important rôle in the history of civilization. The most useful form of this instrument consisted of an evenly balanced disc of metal or wood, hung by a ring at the top, and provided with a diametral Rule with Sights, turning within a circle of degrees, and used thus for measuring the altitude of the sun or stars.

Only in the middle of the eighteenth century was the "Astrolabe and Cross Staff" superseded, in navigation by the sun and the stars, by Hadley's Quadrant. The story is entrancing, far too long for a discussion. I think it is well to be reminded that our earth is after all a very humble member of a great community; only the fifth largest planet belonging to one of the *lesser stars*. So insignificant are we that almost anywhere up yonder we must, in the midst of the grandeur of the universe, practically pass *unnoticed*.

The lecturer, on p. 160, makes reference to the old-world interpretation of the "circle of the earth." May I suggest that *hûg*, the word translated "circle" in Isa. xl, 22, and "compass" or "vault" in Job xxii, 14, and the same in Prov. viii, 27, in each case refers to the *vault* of the *heavens* bounded by the horizon, and not to the earth at all?

Eratosthenes, in 250 B.C., was the first to measure and determine that, as a traveller proceeded northwards one degree of latitude, the altitude of the Pole Star increased by one degree. Pythagoras and Aristotle used many arguments in order to prove the earth was

spherical, some of which are used to-day, but as a fact all that was said was a speculation until explorers had actually sailed around the earth and discovered a set of stars in the south which they had never seen before in the north—a condition which would not have arisen if the earth had been a flat plane. The ancients had much to learn, and I feel sure that we with our extended knowledge have very much more to learn than they, but “a wise man will hear, and will increase in learning, and a man of understanding shall attain unto wise counsels” (Prov. i, 5).

LECTURER'S REPLY.

While thanking the Chairman and the others who have taken part in the discussion for their very kind remarks, I will confine my comments to the two points where I seem to be at variance with Dr. Denham.

Dr. Denham states that “the present Jewish Calendar differs greatly in its incidence from that which orthodoxy deems to have been used in Biblical times. The fact is, that little or no knowledge of the Exodus Calendar . . . exists, save that its months were lunar.”

There are, however, the following other points of similarity :—

An intercalary month is in use in both.

The names of nearly all the months in the present Jewish Calendar are derived from Biblical originals.

In fact, there seems to be as much similarity between the two as between our calendar and that of Julius Cæsar.

The other point is that of an intercalary day or days in the month. Dr. Denham, in taking up this point, refers to intercalary months in the year—a very different matter ; my point was that, if the week of seven days had been originally a quarter of the month, the difference of more than a day between four weeks and a lunation would have had to be made up by intercalary days in the month, *i.e.* there would have been four weeks of seven days and then an extra day or days to make up the month. But of this there is no trace, however far we go back in history.

745TH ORDINARY GENERAL MEETING,

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL,
WESTMINSTER, S.W.1, ON MONDAY, APRIL 13TH, 1931,

AT 4.30 P.M.

DR. JAMES W. THIRTLE, M.R.A.S., IN THE CHAIR.

The Minutes of the previous meeting were read, confirmed, and signed, and the HON. SECRETARY announced the election of the following:— as Members, the Rev. H. S. Curr, B.D., B.Litt., H. O. Weller, Esq., B.Sc., M.Inst.C.E.; as an Associate, the Rev. William H. Small, C.F.; and as a Missionary Associate, Mrs. T. Bomford.

The CHAIRMAN then introduced the Rev. David M. McIntyre, D.D., to read his paper on “The Jewish Apocalyptic in Relation to the New Testament.”

JEWISH APOCALYPTIC IN RELATION TO THE NEW TESTAMENT.

By THE REV. D. M. MCINTYRE, D.D.

WITH reference to the Scriptures of the Old Testament the apostle Peter informs us that “men spake from God, being moved by the Holy Spirit.” Inspired men, communicating the divine message to their contemporaries, spoke and wrote according to their mental habitudes. That which guaranteed the divine authority of the words which they uttered secured at the same time the individuality of the sacred writers—they were led to apprehension and moved to communication by the Holy Spirit, the Spirit of the Christ.

The first duty of a Hebrew prophet was to make God known, as He is in Himself, and as He has revealed Himself in covenant

with His people. Thereafter it was his task to apply the doctrine of God to the age in which he lived, pressing the Spirit-given revelation upon the heart and conscience of his contemporaries as an authoritative rule of life, condemning sin and inciting to virtue, rousing the nation to penitence and persuading to the obedience of faith. Finally, it lay closely within his commission to foretell the advent of the Messiah and to depict the glory of His reign. This last feature of prophetic ministry has been termed "apocalyptic"—it withdraws the veil which shrouds the mysteries and glories of the future age.

I.

Apocalyptic is prophecy, but prophecy in a particular mode. Its chief characteristics are these: (a) It is prevision; (b) it is couched in highly symbolical language; (c) it commits itself to definite anticipations of that which shall befall; (d) as it surveys the future it overleaps all barriers of race, becoming a Gospel for all mankind—although that Gospel is still, for the most part, framed in terms of the revelation entrusted to Israel.

(a) One impressive feature of apocalyptic is that it predicts the future in the language of vision, vision not clearly discerned but formless—at times looming dark with danger, at other times radiant with hope. Vision is characteristic of all prophecy. From the days of Abraham to those of Moses, from Samuel to Isaiah, from Ezekiel to Zechariah, the word of the Lord came to those to whom the faculty of spiritual sight has been granted. The prophets were "seers"; for them to see was to live.*) But the later Jewish apocalyptists do not appear actually to have seen visions; they framed their waking thoughts in spectacular representations.

(b) Because of this simulation of vision the language of the apocalyptists is frequently overcharged with symbolism. Even in the Scriptures the wealth of figurative speech often dazzles one. Take for example, this word of Joel:—

"In those days will I pour out My Spirit. And I will show wonders in the heavens and in the earth, blood and fire, and pillars of smoke. The sun shall be turned into darkness, and the moon into blood, before the great and terrible day of the Lord come."

* "Voir c'est vivre"—*Vinet*.

Or this, from the book of Revelation :—

“ And I saw another strong angel coming down out of heaven, arrayed with a cloud ; and the rainbow was upon his head, and his face was as the sun, and his feet as pillars of fire.”

(c) The apocalyptic mode of prophecy frequently indulges in detailed prediction of future events. This is so much the case in the Prophecies of Daniel and the Book of Revelation that many students of unfulfilled prophecy believe that they are able to chart out the future with something like exactitude. The dates given in Daniel, for example, are precise :—

“ Seventy weeks are determined upon thy people.”

“ Unto two thousand and three hundred days, then shall the sanctuary be cleansed.”

“ From the time that the daily sacrifice shall be taken away . . . there shall be a thousand two hundred and ninety days.”

“ Blessed is he that waiteth, and cometh to the thousand and three hundred and five and thirty days.”

(d) Apocalyptic looks forward to the consummation of the age. It occupies itself chiefly with these foreseen events : the advent of the Messiah, the establishment of the Messianic kingdom, the rise and fall of Antichrist, and the Last Judgment. All these events are to take place in “ the last days ” of which the prophets so frequently make mention. In the last chapter of Zechariah—to take only one instance—the familiar expression “ in that day ” occurs in connection with (1) the manifestation of the Messiah (verse 4) ; (2) the mingled experiences of mercy rejoicing against judgment (verse 6) ; (3) the ministration of the Spirit symbolized by the flow of living waters from the Holy Hill (verse 8) ; (4) the uncontested reign of Jehovah over the whole earth (verse 9) ; (5) the perfection of Gospel holiness in the City of Jerusalem and in the courts of the Lord’s house (verses 20, 21).

One striking feature of the extra-canonical apocalypses is, they are pseudonymous—they are ascribed to holy and reverend personages of the ancient time. In this there was no intention to deceive. No reader of the first or second century before Christ would believe that the treatise which he held in his hand had

actually been composed by Enoch, or Noah, or the Twelve Sons of Jacob, or Moses, or Isaiah, or even by Baruch. The attribution of those modern works to the patriarchs of the grey dawn was a mere literary quaintness, comparable perhaps to Landor's *Imaginary Conversations*. The late Archdeacon Charles, the most learned and laborious student of "apocalyptic" of our own day, or, indeed, of any other, has a more laboured explanation. He says:—

“When once this idea of an inspired law—adequate, infallible, and valid for all time—had become an accepted dogma of Judaism, as it became in the post-exilic period, there was no longer room for independent representatives of God appearing before men, such as the pre-exilic prophets.”*

But as the assumed names could deceive no one, and were not at all intended to mislead, it is difficult to see what authority they could confer upon apocalypses to which those potent titles were prefixed.

There is one of the Old Testament writings which, more than any other, is distinctively apocalyptic—the Book of Daniel.

The question of the date of Daniel's prophecies need not detain us now. I take it for granted that the book presents to us truthful history and authentic prediction, and that it is earlier than any of the Jewish apocalypses which have come down to us, that it is in truth the Book of "Daniel the Prophet" (Matt. xxiv, 15). Recent research has dealt severely with some who have too lightly impugned the veracity of this wonderful book.

The later Jewish apocalypses have borrowed freely from all the apocalyptic sections of the Old Testament; but they derive chiefly from the canonical Book of Daniel. Our Lord's Discourse on the Last Things is partly based upon it, and the Revelation of St. John produces all the imagery made use of by the seer who beheld visions of God on the banks of Hiddekel and Ulai.

Some German scholars, Baldensperger, Schweitzer, and others, reacting against the opinion which formerly prevailed in Germany—that our Lord's teaching was mainly ethical—have asserted that His ethics were merely provisional, that He was before all else an apocalypticist, and that He regarded life and history in the light of the swiftly approaching cataclysm that was

* *Eschatology*, p. 201.

to usher in the close of the dispensation, if not indeed the termination of the world's course. Already the pendulum has come back to poise, and Biblical scholars recognize that our Lord's message was not first apocalyptic, neither was it primarily ethical, but evangelical; by the full announcement of the Gospel both character and destiny are enfolded in the life eternal.

The earliest and in some respects the most important of the extra-canonical Jewish apocalypses is "The Book of Enoch." It is a compilation rather than a discourse, and the date of its several sections ranges from 170 to 64 B.C. Dr. Charles maintains that its influence on the New Testament in respect both of thought and language has been greater than that of all the other apocryphal and pseudepigraphical books taken together. It is a Palestinian document; was composed in Hebrew, and has been preserved in an Ethiopic version rendered from a Greek translation. "With the earlier Fathers and Apologists it had all the weight of a canonical book."

"The Testaments of the Twelve Patriarchs" appeared in the later years of John Hyrcanus, probably between 109 and 106 B.C. It appears to have been written in Hebrew by a Pharisee, although it contains a number of dogmatic Christian interpolations. While this treatise presents a very lofty ethical code it reflects, especially in the "Testaments" of Levi and of Naphtali, the apocalyptic teaching of the period. John Hyrcanus held the threefold dignity of prophet, priest, and king, and was by some greeted as the Messiah.

The date of "The Book of Jubilees" is still a matter of debate. It is not earlier than the first century before Christ, nor later than the destruction of Jerusalem. Its main thesis is the validity and sanctity of the Mosaic law, and it contemplates the speedy inauguration of the Messianic age. It was written in Hebrew by a devout Jew of Palestine; it is sterner than the others in its contempt of the Gentiles.

"The Psalms of Solomon" were apparently written in Hebrew about 60 B.C. They preserve the tone of the lyric poetry of the Old Testament, and the distinction they draw between the righteous and the ungodly is quite after the manner of the Hebrew prophets. The anticipation of the Messianic kingdom is keen: "The writer looks for a personal Messiah who, as the Son of David and King of Israel, shall cleanse Jerusalem from the heathen, smite the ungodly, and bring back the 'Dispersion.'"

“The Sybilline Oracles,” as we have them, consist of twelve books in Greek hexameters. They date from about 140 B.C. to the fifth century A.D., or even later. They profess to be the continuation of a series of oracular sayings such as were current in Egypt from the time of the Fifth Dynasty, and later in Greece and Rome. Some of them are Jewish, others Christian. The Prologue and Books III–V are pre-Christian.

Other pseudepigraphic writings which have some affinity with apocalyptic are “The Ascension of Isaiah,” “The Assumption of Moses,” “The Apocalypse of Baruch,” “The Secrets of Enoch,” and the fourth “Book of Esdras.” These are all within the Christian era, but they contain elements which are distinctively Jewish. The difficulty is to distinguish these passages from those of a later date.

The apocalyptic writings of the first and second centuries before Christ do not appear to have been regarded with favour by either Pharisees or Sadducees. The Sadducees had settled down to contentment with things as they were; the Pharisees held firmly to the all-sufficiency of the law. But the popular mind responded eagerly to the visions of the future as sketched by the apocalypticists. And for that reason some have thought that these treatises influenced our Lord and His apostles. This line of investigation has been much overdrawn. We may, however, suggest:—

(a) There are several passages in the New Testament which find an almost exact parallel in the Apocalypses. Take, for example, the oracle of Enoch as recorded in the Epistle of Jude:—

“And to these also Enoch, the seventh from Adam, prophesied, saying, Behold, the Lord came with ten thousand of His holy ones, to execute judgment upon all, and to convict all the ungodly of all their works of ungodliness which they have ungodly wrought, and of all the hard things which ungodly sinners have spoken against Him ” (verses 14, 15).

This is to be found almost word for word in the Book of Enoch (i, 9, *cf.* v. 4; xxvii, 2).* It is, of course, possible that both the

* The oracle is prefaced by words which occur in several of the apocalyptic writings—“the seventh from Adam”—(Enoch lx, 8, xciii, 3; Jubilees vii, xxxix).

author of Enoch and Jude drew from an earlier writing ; but the direct dependence of the Epistle upon the Apocalypse is more likely. The Book of Enoch had high authority in the early Church. Clement of Alexandria, Tertullian, and Augustine seem to have believed that the author spoke by the illumination of the Spirit of God. Dr. Charles enumerates nearly sixty quotations from or allusions to the Book of Enoch in the New Testament. Some of these are doubtful, but others can hardly be gainsaid.

In the same Epistle there is a reference to the raising of the body of Moses as this is narrated in the Assumption of Moses. We learn this on the authority of Clement of Alexandria, Origen, and Didymus. Of the Assumption of Moses, as distinguished from the Testament of Moses, which sometimes goes under the former title, only a few fragments remain, and this incident of the strife of the angels is not contained in them.*

(b) We have in the apocalyptic writings many turns of expression which remind us of New Testament phrases ; as for example : " Pain shall seize upon them when they see that Son of Man sitting on the throne of His glory " (*cf.* Matt. xxv, 31 ; Rev. vi, 16). " I saw and behold a star fell from heaven " (*cf.* Rev. ix, 1). " The horses shall walk up to the breast in the blood of sinners " (*cf.* Rev. xiv, 20). " Lord of lords, King of kings " (*cf.* Rev. xvii, 14). " Angels of power " and " angels of principalities " (*cf.* Rom. viii, 38 ; Eph. i, 21 ; Col. i, 16). " According to His good pleasure " (*cf.* Eph. i, 9). " All things are naked and open in Thy sight, and Thou seest all things, and nothing can hide itself from Thee " (*cf.* Heb. iv, 13). " The sum of judgment was given unto the Son of Man " (*cf.* John v, 22). " I will seat each on the throne of his honour " (*cf.* Matt. xix, 28). " It had been good for them if they had not been born " (*cf.* Matt. xxvi, 24). " I kept these words in my heart " (*cf.* Luke ii, 19). " His God and the God of his fathers sent forth His angel, and delivered him out of my hands " (*cf.* Acts xii, 11). " The wrath of the Lord came upon them to the uttermost " (*cf.* 1 Thess. ii, 16). " They both do the evil thing and they have pleasure in them that do it " (*cf.* Rom. i, 32). " By doing good he overcometh evil " (*cf.* Rom. xii, 21). " True repentance after a godly sort " (*cf.* 2 Cor. vii, 10). " If a man sin against thee, speak peaceably

* Jude seems to have been acquainted also with the " Testament of Moses." Compare Jude 16 with the so-called Assumption of Moses, vii, 7, 9.

to him . . . and if he repent and confess, forgive him" (*cf.* Luke xvii, 3). "Arise, put on the robe of the priesthood and the crown of righteousness, and the breastplate of understanding, and the garment of truth, and the plate of faith, and the turban of the head, and the ephod of prophecy" (*cf.* Eph. vi, 13-17). "Beliar shall be bound by him, and he shall give power to his children to tread upon the evil spirits" (*cf.* Mark iii, 27; Rom. xvi, 20). "The heavens shall be opened unto him, to pour out the Spirit, even the blessing of the Holy Father; and he shall pour out the Spirit of grace upon you; and ye shall be unto him sons in truth" (*cf.* John iii, 34; Acts i, 4, 5; ii, 33). "The saints shall rest in Eden, and in the New Jerusalem will the righteous rejoice" (*cf.* Rev. ii, 7; xxi 2). "And the veil of the temple shall be rent, and the Spirit of God shall pass on to the Gentiles as fire poured forth" (*Matt.* xxvii, 51; iii, 11).

Some of these sayings were, no doubt, "in the air," part of the common speech of men. In other instances we seem to trace a direct derivation from one or other of the Jewish apocalypses. But as these in turn have their source in the canonical Scriptures, we do not find a great deal in the apocalyptic writings which has not been already set forth in the Old Testament.*

The apocalyptists gather out of the Old Testament Scriptures those predictions which converge upon "the last days," and present them to us in a certain order, as if prophecy had translated itself into dogma. We may illustrate this in some detail.

II.

Let us, in the first place, summarize the teaching of the apocalyptists regarding the advent of the Saviour. In harmony with the anticipation of the Hebrew prophets the apocalyptists foretell the advent of Jehovah in connection with the coming of the predicted Redeemer:—

"The Holy Great One will come forth from His dwelling,
And the eternal God will tread upon the earth . . .

* Dr. A. B. Bruce surely speaks too strongly when he says: "Scholars may revive a professional interest in apocalyptic, and it is not to be denied that the exegete of the New Testament may learn something from their labours; but the great heart of humanity has only one duty to perform towards it, and that is to consign it to oblivion." *Apologetics*, p. 293.

And appear in the strength of His might from the heaven of heavens" (Enoch i, 3, 4).

"The Holy Lord will come forth with wrath and chastisement to execute judgment on earth" (*ibid.* xci, 7).

It is not that the Messiah is to be identified with Jehovah, but that in His coming the eternal Lord shall be manifested. This is the consistent teaching of the Old Testament, from the theophanies of the patriarchal age to the visions of Daniel. Always the Deliverer is to be manifested in the spirit and power of Jehovah; in His advent the Messenger of the Covenant is frequently lost sight of by reason of the splendour of the Divine presence. The Messianic King is seen hastening over the mountains of prevision, but "the kingdom is the Lord's" (Obad. 21).

The Old Testament galleries present to us in a variety of aspects the figure of "Him that is to come." He is foreknown as the Seed of the woman, Shiloh, the King of Israel, Immanuel, the Son of God; He comes with many other titles of power and honour. But one name which has overshadowed all others—the Anointed One—was announced by Gabriel to Daniel, when he foretold the advent of Messiah the Prince (Dan. ix, 25, 26). The thought which expresses itself in the word is *consecration*. The holy anointing oil marks off that one on whom it is poured—prophet, priest, or king—as one who belongs to God, and is separated to the service of His kingdom. In the Psalms of Solomon, for instance, the future Deliverer is described as the anointed king of the holy nation (ch. xvii). Unction in the New Testament is a symbol of the endowments of the Holy Spirit, and this suggestion was already present in the earlier Scriptures:—

"He shall be a righteous king, taught of God over them;
And there shall be no unrighteousness in his days in their midst,

For all shall be holy, and their king shall be the anointed of the Lord . . .

With the word of his mouth he will smite the earth for ever.
With wisdom and gladness he will bless the people of the Lord;

And he himself will be pure from sin, so that he may rule a great people . . .

For God will make him mighty by means of His Holy Spirit,
And wise by means of the Spirit of understanding with strength and righteousness.

And the blessing of the Lord will be with him . . .
 He will shepherd the flock of the Lord faithfully and
 righteously,
 And will suffer none among them to stumble in their
 pasture.
 He will lead them all aright . . .
 This will be the majesty of the king of Israel whom God
 knoweth."

The title which our Lord selected for His own use from a number of anticipatory titles was "the Son of Man." It occurs some four-score times in the Gospels and always from the lips of our Lord Himself.* This designation is derived primarily from the protevangel, which foretells the sufferings and triumphs of the Seed of the woman (Gen. iii, 15). We trace it again in the 80th Psalm :—

"Let Thy hand be upon the Man of Thy right hand, upon the Son of Man whom Thou madest strong for Thyself" (verse 17).

But it is probable that our Lord in choosing this title took it out of the Prophecies of Daniel, where it is directly associated with the advent of the spiritual kingdom (vii, 13) :—

"I saw in the night visions, and behold, there came with the clouds of heaven One like unto a son of man, and he came even to the Ancient of days, and they brought him near before Him. And there was given him dominion, and glory, and a kingdom, that all the peoples, nations, and languages should serve him: his dominion is an everlasting dominion which shall not pass away, and his kingdom that which shall not be destroyed."

In the Similitudes of the Book of Enoch the most frequent appellation of the Coming One is "Son of Man." During this period (*c.* 105–64 B.C.) the Messianic hope had become vivid and buoyant. In the vision of the Ancient of days there was "with Him another being whose countenance had the appearance of a man, and his face was full of graciousness, like one of the

* John xii, 34 is not an exception; the people are quoting His own words. Acts vii, 56 also is a quotation of His saying recorded in Matt. xxvi, 64.

Holy Angels." The interpreting angel discovered to Enoch the hidden movements of this heavenly being :—

“ This is the Son of Man who hath righteousness,
 With whom dwelleth righteousness,
 And who revealeth all the treasures of that which is hidden,
 Because the Lord of Spirits hath chosen him . . .
 And he shall put down the kings from their thrones and
 kingdoms . . .
 Because they do not extol the name of the Lord of Spirits ”
 (xlvi, 3-6).

In the 62nd chapter the Son of Man is introduced to our notice as that elect one whom the Lord of Spirits established upon the throne of His glory :—

“ The spirit of righteousness was poured out upon him,
 And the word of his mouth slays all the sinners . . .
 No lying word is spoken before him.”

“ From the beginning,” it is said, “ the Son of Man was hidden. The Most High preserved Him in the presence of His might, and revealed Him to the elect.”

“ Yea, before the sun and the signs were created,
 Before the stars of the heaven were made,
 His name was named before the Lord of Spirits . . .
 And for this reason hath he been chosen and hidden before
 Him,
 Before the creation of the world and for evermore.”—
 (xlviii 2, 6).

Again, in the third Parable (ch. 69), we read :—

“ And there was great joy amongst them,
 And they blessed and glorified and extolled,
 Because the name of that Son of Man had been revealed
 unto them.
 And he sat on the throne of his glory,
 And the sum of judgment was given unto the Son of Man . . .
 And all evil shall pass away before his face.”

In chapter 71 the birth of the Son of Man is referred to :—

“ And the angel came to me, and greeted me with his voice,
 and said unto me :

This is the Son of Man who is born unto righteousness . . .
 And all shall walk in his ways since righteousness never
 forsakes him . . .
 And so there shall be length of days with that Son of Man . . .
 In the name of the Lord of Spirits for ever and ever."

Other names given to the Promised One in the Book of Enoch are : " The Elect One " and " The Righteous One." These are drawn from the prophecy of the Servant of Jehovah in the Book of Isaiah. The Righteous and Elect One shall arise, and be made manifest : He shall sit on the throne of the Eternal Lord, calling to Himself the righteous and holy people, causing the house of His congregation to appear, but judging Azazel and all his associates, and all his hosts, in the name of the Lord of Spirits (li, 5 ; liii, 6 ; lv, 4).

One other significant title is found in the Book of Enoch—
 " the Son of God." :—

" I and My Son will be united with them (the children of the earth) for ever in the paths of uprightness in their lives ; and ye shall have peace : rejoice, ye children of uprightness " (cv, 2).

In the Testaments of the Twelve Patriarchs several distinctively Christian titles are conferred upon the Expected One :—

" Christ, the Saviour of the world " (Levi x, 2 ; xiv, 2) ;
 " the Lamb of God, the Saviour of the world " (Benjamin iii, 8).

These are probably late insertions. Other sentences seem to be drawn from a Christian source, as, for example :—

" Until the Most High shall visit the earth, coming Himself as Man, with men eating and drinking, and breaking the head of the dragon in the water " (Asher vii, 3).

The Most High shall send forth His salvation in the visitation of an only-begotten prophet. And He shall enter into the temple, and there shall the Lord be treated with outrage, and he shall be lifted up upon a tree. And the veil of the temple shall be rent, and the Spirit of God shall pass on to the Gentiles as fire poured forth " (Benjamin ix, 2, 3).

“ Then shall we also rise, each one over our tribe, worshipping the king of heaven, who appeared upon earth in the form of a man in humility. And as many as believe on Him on the earth shall rejoice with Him ” (Benjamin x 7).

Other appellations seem to belong (though doubtfully) to the first stratum of this treatise, as when the Messiah is entitled :—

“ the Beloved of the Lord ” (Benjamin xi, 2); “ a new priest ” (Levi xviii, 2); “ the Star of Jacob ” (Judah xxiv, 1).

In the Book of Jubilees the Promised Deliverer is named “ the help of Jacob,” and “ the salvation of Israel ” (xxxii, 19).

While there is nothing in these passages that may not be legitimately inferred from the Scriptures of the Old Testament, it is evident that the anticipation of the Promised One has become more definite and arresting, now that the whole field of prophecy has been laid open. Scattered intimations are drawn together, dark sayings are examined in the light of simpler statements, opposing anticipations are taken up into a higher unity, and so the doctrine of the Messiah has grown to form.

He comes, bearing the titles and prerogatives of Jehovah, pre-existent before all ages, an Ambassador from the Throne of the Eternal, to execute a divine commission. Yet is He a Child of earth, of the lineage of David, also a Plant of renown sprung from the root of Levi; the Anointed One, the Son of Man, the Elect of Jehovah, the Righteous One, a Priest among men, a Redeemer of mankind, the Defence of Israel, Ruler over the Messianic kingdom, Prince of the kings of the earth, and Judge of all mankind.

III.

For the most part the foreview of the later Jews as they waited for the advent of the Deliverer was confined within the lines drawn by the inspired writers of the Old Testament Scriptures. But in regard to the nature of the Messianic kingdom their fancy took a wider range. We shall, however, content ourselves with observing those points where contact is made with the Scriptures.

In the second century before Christ the devout Israelite looked forward to the fulfilment upon earth of the ancient prophecies. The kingdom of the Messiah was to be an enlargement of the Jewish theocracy. Israel was to be restored to purity and led into peace. The Anointed One would reign from Zion, and all the nations would bow before His sceptre. The Book of Enoch and the Testaments of the Twelve Patriarchs have a generous outlook upon the Gentile world, though from an entirely Jewish standpoint; but the Book of Jubilees has something of the fierce Pharisaic spirit, which regards the "heathen" nations as fuel for the burning. In this treatise we encounter frequently the surge of that feeling which caused the Pharisees, as they clustered round the steps of the Tower of Antonia, to exclaim, at the mere mention of the word "Gentiles":—

"Away with such a fellow from the earth, for it is not fit that he should live" (Acts xxii, 22).

Solomon's Psalter allows that the Gentile nations may be spared "to serve Him under the yoke" (xvii, 32), but The Assumption of Moses (x, 7), Judith (xvi, 17), 2 Baruch (lxxii, 2 ff.), the Sibylline Oracles (iv, 562), and the Book of Jubilees seem to have forgotten mercy:—

"They will use violence against Israel and transgression
against Jacob,
And much blood will be shed upon the earth,
And there will be none to gather and none to bury.
In those days they will cry aloud,
And call and pray that they may be saved . . .
But none will be saved" (Book of Jubilees, xxiii 23, 24).*

But in the first century before Christ, as the time appointed drew near, a more spiritual conception began to appear in the apocalyptic writings. The kingdom of the Messiah was to be manifested not as an earthly rule, given over to pride and vain-glory, but as a reign of righteousness and peace. As we trace the progress of the kingdom in some of the earlier apocalypses we can understand why our Lord substituted the title Son of

* See *Psalms of Solomon*, xvii, xviii.

Man for the name Messiah, a word that was in all men's speech, but was misunderstood by most. It was so intimately associated in the minds of the men of our Lord's day with thoughts of an earthly deliverance from the Roman yoke, together with the aggrandisement of Jerusalem as a lady of kingdoms, that He, who came to shed no blood but His own, hesitated to appropriate this distinctive title until, by His sufferings and death, He had purged it of unhallowed meanings.

The kingdom is to be revealed in suffering, "the woes of the Messiah" are to fall on Israel as well as on the Gentile peoples. The Messiah comes encircled with clouds of storm: He is the herald of the Judge:—

"The eternal God . . .

Will appear in the strength of His might from the heaven of heavens.

And all shall be smitten with fear,

And the Watchers shall quake,

And great fear and trembling shall seize them unto the ends of the earth.

And the high mountains shall be shaken,

And the high hills shall be made low,

And shall melt like wax before the flame.

And the earth shall be wholly rent in sunder,

And all that is upon the earth shall perish,

And there will be a judgment upon all men.

But with the righteous He will make peace,

And will protect the elect,

And mercy shall be upon them"—(Enoch i, 4-8).

Before the kingdom shall be established among men three great events shall take place:—

(a) Israel shall be gathered from the lands of the Dispersion:—

"The Lord shall gather you together in faith through His tender mercy, and for the sake of Abraham, Isaac and Jacob" (Test. Asher vii, 7).

(b) The nations shall be judged:—

"Then shall He call for all the Gentiles, and some He shall preserve alive, and some He shall destroy" (2 Baruch lxxii, 2 ff.).

(c) An evil power, named Beliar, who is at times identified with Azazel, shall rise and make war against the rule of the Messiah. This son of wickedness shall be subdued and cast into the abyss of fire.

Beliar is "the last leader" of the forces opposed to the kingdom of God. He is described as the angel of lawlessness, the ruler of this world, the power of darkness, the chief of the spirits of evil. This name is probably identical with the "Belial" of 2 Cor. vi, 15, the "r" being due to the harsher pronunciation of the Aramaic. The word is generally understood as signifying worthlessness, godlessness. Dr. Cheyne takes it to mean "hopeless ruin." It has been suggested by some that Beliar was the name of a Syrian deity, and as idol worship is infused with demonic influences (1 Cor. x, 20), it was naturally employed to denote anything emanating from the evil one, and at length was taken to represent the prince of the demons himself.

The Messiah takes the field against this evil power in the great battle of the Lord of hosts :—

"There shall arise unto you from the tribe of Judah and of Levi the salvation of the Lord ; and he shall make war against Beliar."—(Test. Dan. v, 10.)

It is interesting to observe the name given to this Captain of salvation : it is the name of Jesus ; it was the rallying cry of the Maccabees—"Jehovah saves." By means of the Messiah, "God shall redeem all the captivity of the sons of men from Beliar." "Beliar shall be bound by him, and he shall give power to his children to tread upon the evil spirit." And Beliar shall be cast into the fire for ever (Test. Levi xix, 1 ; xviii, 12 ; Dan. v, 10 ; Jud. xxv 3 ; Mart. Isa. ii, 4).

The Armageddon of God is to be followed by the Resurrection.

One cannot trace any clear line of progress in this doctrine from the time of the Maccabees to the days of Christ. Different schools of thought maintained different views, and each held on its own way. In the Book of the Jubilees, for example, the resurrection is virtually denied :—

"The righteous will see and be thankful,
And rejoice with joy for ever and ever . . .
And their bones will rest in the earth,
And their spirits will have much joy."—(xxiii 30, 31.)

In 2 Maccabees it is taught that the righteous shall be raised corporally, apparently to share in the glories of the Messianic kingdom upon earth :—

“ After him was the third made a mocking-stock ; and when he was required he put out his tongue, and that right soon, holding forth his hands manfully, and said courageously, These I had from heaven ; and for His laws I despise them ; and from Him I hope to receive them again ” (vii, 10, 11).

The Sibylline Oracles anticipate the resurrection only of the godly :—

“ All that sinned in godlessness, over them shall earth be heaped to cover them, dark spaces of Tartarus and Stygian recesses of Gehenna ” (iv, 185 ff.).

The Testaments of the Twelve Patriarchs teaches the resurrection first of the patriarchs, then of the tribes of Israel, then of all men :—

“ Then shall ye see Enoch, Noah, and Shem, and Abraham, and Isaac, and Jacob, rising on the right hand in gladness. Then shall we also rise, each one over our tribe, worshipping the King of heaven . . . Then also all men shall rise, some unto glory and some unto shame ” (Test. Benj. x, 6-8).

It is to the Book of Enoch that we seem to owe the insistence upon the resurrection which characterises the apocalyptic anticipation of the second and first centuries before Christ. Archdeacon Charles writes : “ This doctrine, which is first taught beyond possibility of doubt in Daniel xii, though a true exegesis will find many intimations of the doctrine in earlier books, was made a commonplace of Jewish theology by Enoch.” But he finds in the several strata of the Book of Enoch divergent views of the nature of the resurrection. He detects these in particular : (a) to an earthly Messianic kingdom of eternal duration of soul and body ; (b) to a spiritual kingdom in which the righteous have a spiritual body ; (c) the resurrection of spirit only. Elsewhere he says : “ There are three Jewish doctrines of the resurrection : (i) All Israelites are to rise ; (ii) all righteous Israelites ; (iii) all mankind.” Until Christ illuminated life and

immortality in His Self-manifestation it was perhaps inevitable that the elder saints should have had uncertain views of life beyond the veil.

The doctrine of the judgment is prominent in the teaching of the apocalyptists. The Messianic age is to be ushered in with appalling calamities. The later Jews termed these "the birth-pangs of the Messiah." The armies of discord are to be marshalled by Azazel. The meaning of this name is much disputed. It is questionable if the use of this word in Leviticus xvi, 8, 10, 26, has reference to an individual; it may rather signify the removal of sins. These are to be borne by the goat of expiation into a land not inhabited, a place of forgetfulness. In the Jerusalem Targum this is named Beth Chaduda, a hard and rough place in the wilderness piled high with jagged rocks (Charles, *Apoc.*, etc., ii, 193). But in the Book of Enoch Azazel is the leader of the fallen angels (lxxxvi, 1), to whom all sin is ascribed (x, 8). It was he who "taught all unrighteousness on earth" (ix, 6). The judgment upon this ruler of the might of darkness is to be by the rising up of the Almighty (Ass. Moses x, 3), but the execution of it is to be committed to the Elect One, the Son of Man (Enoch lv, 4). Azazel is to be fettered and cast into Dudael (Beth Chaduda), a place of darkness, with huge rocks towering overhead and filled with devouring fire (Enoch x, 5; xiii, 1; liv, 5, 6).

But in that day peace will rest upon the righteous, and the light of God will shine upon them :

"All their days they will fulfill and live in peace and in joy,
And there will be no Satan nor any evil destroyer;
For all their days will be days of blessing and healing"
—(Jub. xxiii, 29.)

The curse will be removed from the land, and fruitfulness beyond measure shall be the gift of the seasons :—

"Then shall the whole earth be tilled in righteousness, and shall all be planted with trees and be full of blessing . . . And all nations shall offer adoration and shall praise Me, and all shall worship Me. And the earth shall be cleansed from all defilement and from all sin, and from all punishment, and from all torment, and I will never again send them upon it from generation to generation" (Enoch x, 18-22).

The Sibylline Oracles enter into a still more detailed description of the luxuriance of that happy time :—

“ When this destined day is fully come, a great rule and judgment shall come upon men. For the fertile earth shall yield her best fruit of corn and wine and oil ; it shall gush out in sweet fountains of white milk : the cities shall be full of good things, and the fields with fatness ; no sword shall come against the land, nor shout of war ; nor shall the earth again be shaken, deeply groaning : no war or drought shall afflict the land, no dearth nor hail to spoil the crops, but deep peace over all the earth ; king shall live as friend to king to the bound of the age, and the Immortal shall establish in the starry heaven one law for men over all the face of the earth for all the doings of hapless mortals. For He alone is God, and there is no other ” (iii, pp. 742–761).

The earthly reign of the Messiah is brought to a close by the Last Judgment. It is a judgment according to works (Ecclus. xvi, 14), according to opportunities (Jub. v, 15), embracing both worlds (Jub. v, 10, 14). It is to be the judgment of God (4 Ezra vii, 33), to be executed by the Messiah (Enoch xlv, 3). It shall be irreversible, “ a judgment that continues for ever and ever ” (Enoch x, 12). It is to mark “ the consummation of the times,” “ the termination of the ages,” “ the end of the world.”

The judgment upon the wicked shall be very terrible ; the worm of corruption will batten, fire and brimstone devour :—

“ In the Lord’s Day of Judgment the sinners shall be destroyed for ever ; when God will punish the earth with His judgment . . . the sinners will go to everlasting destruction ” (Pss. Sol. xv, 12, 13).

But the righteous shall enter into peace. The world as it now is shall be destroyed, and a new world will take its place (2 Bar. xlv, 12) : discords are to be removed, and endless felicity shall be the portion of the happy people who are saved by the Lord :—

“ And so there shall be length of days with that Son of Man,
And the righteous shall have peace and an upright way,

In the name of the Lord of Spirits for ever and ever”
(Enoch lxxi, 17).

The vision of the New Jerusalem (Tobit xiii, 7 ff; xiv, 5; Test. Dan. v, 12), holds a central place in the anticipation of future blessedness; but it is not quite certain if it belongs to the millennial age, or to the great eternity, when “the long beatitudes begin.” Possibly it is the picturing of the heavenly state in terms of this earthly life. This Jerusalem is new, it is the home of the righteous, the seat of worship, the holy city, the holy place, the eternal inheritance (Pss. Sol. viii, 4; Enoch xxv, 5; 2 Enoch lv, 2). A brief description of it in the Book of Tobit (xiii, 16–18), may have suggested the glorious pageant of the New Testament Apocalypse:—

“For Jerusalem shall be built up with sapphires and emeralds and precious stones:
Thy walls and towers and battlements with pure gold . . .
And the streets of Jerusalem shall be paved with beryl and carbuncle and stones of Ophir.
And all her streets shall say, Alleluia.”

DISCUSSION.

The CHAIRMAN (Dr. Thirtle) said: I am sure you will join with me in according thanks to Dr. McIntyre for the deeply interesting paper read before us this afternoon. Some years ago, it was our pleasure to welcome a paper from Dr. McIntyre, but not before, as I believe, have we had the honour of his presence and the privilege of hearing his voice. This afternoon we have heard him in an utterance characterized by a real distinction, and conveying a profitable body of instruction in regard to Holy Scripture. His subject has been “Jewish Apocalyptic in Relation to the New Testament,” and his treatment has been eminently learned and judicious. It would have been easy for him to indulge a wider outlook on the field of Apocalyptic, but all the time he has had in mind the bearing of such Jewish literature upon the New Testament and its teaching; and this could only have been done after much reading, all the time under control of a mind submissive to the New Testament records, and implicates of the same.

In the present day there is a growing interest in Apocalyptic, but it cannot be said that the interest always tends to a constructive result. The subject is one which may be treated with a measurable indifference to the deeper things of faith as set forth in Holy Scripture, but Dr. McIntyre has redeemed the position, and while of set purpose passing by much that would have commanded superficial curiosity, he has brought us to a consideration of uncanonical Jewish writings, in the true sense of the word, and related them in some degree to things that are canonical. He has discussed the irregular and thereby has illustrated that which is of standard value, and we cannot but have been stirred in our hearts as we have listened to his paper.

First of all, I would remark that, from the uncanonical and irregular, we may well have gathered to-day a new love and admiration for that which is canonical and standard. Things that are variable, and some of them vapid, have been passed in review ; but we cannot withhold thanks to God, who in the Holy Scriptures has given us the canon, or measure, by which to estimate the literary products of days succeeding those wherein men spoke from God, being "moved by the Holy Ghost." Our minds go back to the work of prophets, wise men, and scribes, who following well-known formulæ of prophetic utterance—made familiar in the Old Testament and reproduced in some degree in the New—described visions, delivered burdens, and to manifest purpose spoke in the name of the Lord. To some extent, as we have seen, this form of language came into continued use by men who spoke, or wrote, without the authority of divine inspiration. We do well to recognize the fact.

A second thought must have been borne in upon some minds. It is this—that the ideas, historical and prophetic, that make the body of Apocalyptic literature, are seen to have germinated in the seed-plot of the Old Testament Scriptures—comprising the Law, the Prophets, and the Holy Writings. Though the symbols may sometimes have been extravagant, though statements may at times have travelled wide of Scripture record and authority, yet we are, again and again, carried back to utterances by men of the olden time ; and on the ground of things made sure in the Word of Prophecy, as repeated and made popular in a subsequent age,

men have been encouraged in days of difficulty, and have been successfully carried through experiences of sorrow and distress. What did it all mean? For one thing, it meant that, though prophets and inspired teachers of Israel might have been set at naught and killed, yet in substance their words took root in the minds of the people, with the result that, in later days there came an overflow of instruction and stimulus, unauthorized and perhaps inconsistent, from the pens of many writers, in works styled Apocrypha, in some respects spoken of as Apocalyptic, as we have had the subject brought before us this afternoon.

A third impression must have been left in many minds. As we value the Old Testament, and give it a place of abiding influence in our lives, we may easily overlook the fact, important in many ways, that during the long centuries before the Christian era great literary activity prevailed among the Jewish people; even in days of stress that prevailed in the Greek period, when the very existence of the Jewish race was in peril, men gave forth works such as those brought under notice to-day—works that in due time were translated into languages spoken throughout the Dispersion, where Jews might be (and were), sustained in the trials of life. The result is found in surviving books, embodying narrative, fable, and fancy, along with forecasts of the future, sometimes weird, but nevertheless exercising a marvellous influence among the people. With great diligence an endeavour was made to cultivate the Messianic outlook, which told of a good time yet to come, a Golden Age, assured in the purpose and providence of God. To this aspect of things we have been introduced to-day; and we thank Dr. McIntyre for wading through oceans of speculative ideas, in order to relate scattered impressions of truth with the substance of Divine Revelation, which is so precious to our hearts.

The literature which has concerned us has been carefully gathered in the course of generations, as found in Hebrew, Greek, Latin, Armenian, Slavonic, Arabic, and other languages; and as translated in our day, and edited by Archdeacon Charles and his staff of coadjutors, the works have been given to the world in folio volumes—with the title “Apocrypha and Pseudepigrapha of the Old Testament,” issued through the Oxford University Press. It may interest some to know, moreover, that important contributions to

this class of literature have, in recent years, been included in the output of the Society for Promoting Christian Knowledge. It will also be remembered that, from time to time in this hall, we have heard the voice of an erudite Jewish rabbi, Dr. Moses Gaster, whose contributions to Apocalyptic have been of great value. Just three years ago, through the Royal Asiatic Society, Dr. Gaster had the distinction of issuing a volume which, to the astonishment of many, brought the Samaritan remnant of the Northern Kingdom into relation with our subject of Jewish Apocalyptic. The book was entitled—*The Asatir: The Samaritan Book of the Secrets of Moses*.

In this volume we were given a collection of Biblical legends, a sort of parallel to the Jewish *Secrets of Enoch*, in reality, an unauthorized supplement to the Pentateuch. Among other things in the *Asatir*, there is an oracle dealing with events that are to happen in the End of Days. There is no eschatology in the definite sense of the word, no mention of the Day of Judgment or Resurrection; but there is a prophecy concerning a man chosen of God, who will return and inaugurate an era of universal happiness and prosperity, bringing among other things, strange to say, harmony between Jews and Samaritans—with the outlook that, now at length, the Jews would forsake Mount Zion and join the Samaritans in their worship on Mount Gerizim! This Samaritan book, so recently given to the world, has thoughts of a Messiah, and also thoughts of an Antichrist, conceived as the implacable enemy of the people of Israel. The former, as in other Samaritan writings, is *Tehab*, the coming one, apparently Moses, the Law-giver; and the latter is Bileam, whom we know as Balaam in the Book of Numbers, a name everywhere regarded as of evil omen.

As we know, Balaam “advertised” king Balak of Moab in regard to Israel in the latter days; and it would seem that, on the basis of Num., xxiv, and Deut., chapters xxxii and xxxiii, the Samaritans, in the now-recovered *Asatir*, present a body of Apocalyptic distinct from that of the Jews, though in some degree looking in the same direction. In this work, to our surprise, we meet with “a prince that should arise” named Gog; and at once we are reminded of predictions in the Book of Ezekiel and allusions in the Apocalypse of St. John. The occurrence of this name, so terrible in its associa-

tions, is explained by the fact that where, in his famous parable, Balaam speaks of a king who shall be "higher than Agag," the Samaritan Pentateuch reads Gog, and here, moreover, it has the support of the Greek Septuagint. Hence we have in the book before us, the essential elements of Samaritan Apocalyptic; and Dr. Gaster has produced the work in its entirety, with a Samaritan commentary and full introduction. For once, we find Jews and Samaritans in agreement, not indeed, in the matter of worship, but certainly in conceptions of an Apocalyptic order.

As we know, the Samaritans were confined to the Pentateuch: they did not acknowledge the writings of Israel's Prophets. Quite obviously, however, they must have been possessed of the Pentateuch in days before the supplementary "secrets" were evolved; and it would seem that this possession takes us back to a time anterior to the schism whereby they were separated from the southern Kingdom of Judah? To what distant time, then, must we go back to reach the days when the original Books of Moses were written and brought together? Before the Greek period, before the time of Persian rule, to the days of the northern Kingdom? That is another question, however, calling for careful consideration in view of current critical theories.

With these remarks, it gives me pleasure to call for the thanks of the meeting to Dr. McIntyre for his deeply instructive and stimulating paper.

The vote was carried with acclamation.

Mr. G. WILSON HEATH said: May I be permitted to say that a most important subject has been very ably brought before the Society, in the interesting and learned paper to which we have listened. The reading of it has, to many of us, very possibly, been a real Apocalyptic, an opening up of an entirely new avenue of thought and research.

In viewing this subject, and its large mass of literature, all of a very arresting character, I think we may do so without any ulterior thought as to its leading to what is called "Modernism," or to the questioning of the divine inspiration of the Holy Scriptures.

What appears to me to be most important and interesting is,

that our Lord emerges in history, not only at a definite period of time, but in a definite environment; and, perhaps, most conspicuous in this was the powerful early Jewish Apocalyptic literature, which had been then current, as we have heard, for some two hundred years or so. It has been said that, "a flood of light is shed by the form and contents of these writings on our Lord's life, teaching and works," and I think that it possibly was so.

Of the very large number of "Apocalypses," not omitting the "Sibylline Oracles," the most interesting to me is that of the Ethiopic "Enoch," for from it, so it would appear, we have the quotations found in Jude, verses 14 and 15. We know that Tertullian believed in the genuineness of this "Apocalyptic," and he attempted to account for its survival through the Noachian flood; but nothing seems to have been known of its existence until James Bruce brought two versions of it from Abyssinia in 1773, and a translation, partially in English, was published in 1821. The more recent Slavonic "Enoch," or the "Secrets of Enoch," I believe only became known in 1896, and is most interesting as a side light.

However we may view this literature, intrinsically, or as pure history, it certainly illustrates the nature of the setting in which the pure spiritual teachings of our Lord, His Disciples, and St. Paul, found itself, as soon as preached. The "good seed of the Kingdom," it would appear, was liable to become adulterated and choked. The atmosphere for the right reception of truth being, of course, most important. But I believe God was over it all, and through godly men of that day producing an atmosphere of Messianic expectation.

The question which our Lord put to His disciples, "Who do men say that I, the Son of Man, am," and the sublime answer, heaven given, of Peter, "Thou art the Messiah, the Son of the Living God," is, I think, better understood when we know that "Son of Man" was a common expression in the Apocalypses, from the day of Daniel onwards. Our Lord of course, expressed Himself as "*The Son of Man.*"

Lt.-Col. A. G. SHORTT wrote: I see that the lecturer accepts Charles' dating of the Book of Enoch, as having been composed

in the second century B.C. I have always found a difficulty in this, and think Dr. Charles' arguments are distinctly weak. It is not sufficient to say that there are here and there evidences of a Palestinian connection, or that the work may be traced back to a Hebrew source. It may have originated much earlier, and have passed through many Editors' hands. And certainly the evidence for an early origin cannot be disputed.

In Section IV we have a vision wrapped in highly symbolical language detailing the history of Israel, and the only reason Charles scales down the date of the book to the second century B.C. is to avoid the idea of prevision. But the ancients did not wrap up past history in symbolism (*vide* Daniel, and the Scriptures generally). Symbolism was only used in prophecy, and this, in itself, is a strong argument for an early composition.

Moreover, the 364-day year is not known in historical times. Its description is surely archaic, and could not have been post-exilic, while the mere fact that the planets are not mentioned puts the document back 3,000 years at least before the Christian era.

And, finally, Jude definitely describes the Book to Enoch, "the Seventh from Adam." It is remarkable in many cases how little foundation sufficed for many of Charles' theories. I have only room for one. On page 27 of his "Book of Enoch" we find:—"He (Enoch) is, moreover, of an ascetic turn of mind. These visions came to him before he was married, the implication being that he has no such supernatural experiences after marriage. But as visions are inferior to actual waking intercourse with the angels, such as Enoch enjoyed in i-xxxvi, it is clear even on this single ground that these two parts are from different authors." Perhaps the lecturer may be able to throw more light on the matter.

THE LECTURER'S REPLY.

I thank all those who have spoken, for their helpful contributions to the discussion of this subject. We are, I think, especially indebted to Dr. Thirtle for his very interesting and informative remarks.

We shall all agree with Mr. Wilson Heath, that much light is given by the Jewish Apocalypses upon modes of thought and

expression common to many of our Lord's contemporaries. Jude, the Lord's brother, James the Just, and John, the Beloved Disciple, not to speak of other New Testament writers, seem to have been familiar with this class of literature. We may even say that the Apocalyptists helped to create the climate by which the seed of the living word was nourished.

As to Lieut.-Colonel Shortt's question: Now that stores of antediluvian tablets have been unearthed, it is not difficult to believe that traditions from very ancient times may have come down to us. But most writers on the Book of Enoch seem to be of the opinion that this treatise, as we have it, belongs to the second and first century B.C. If I understand Colonel Shortt rightly he is ready to admit this.

746TH ORDINARY GENERAL MEETING,

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL,
WESTMINSTER, S.W.1, ON MONDAY, MAY 4TH, 1931,

AT 4.30 P.M.

ALFRED W. OKE, ESQ., LL.M., F.G.S., IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed, and signed, and the HON. SECRETARY announced the election of the Rev. Canon H. Rolfe of Mauritius, as an Associate.

The CHAIRMAN then introduced the Rev. A. H. Finn to read his paper on "Types in Scripture."

TYPES IN SCRIPTURE.

By THE REV. A. H. FINN.

THE Greek word from which our English "type" is derived has several shades of meaning, the more important being (1) an impression, as of a seal; (2) a figure or image; (3) a pattern or model. The word occurs some fifteen times in the New Testament, the English rendering varying according to the context. In St. John xx, 25, it stands for the "print" of the nails; in Acts vii, 43, it is translated by "figures" (of Moloch and Remphan, made by the Israelites); in Rom. v, 14, we have the "similitude" (R.V. "likeness") of Adam's transgression. In most of the passages the rendering is "example" or "ensample," as in "mark them which walk so as ye have us for an ensample" (Phil. iii, 17), or "be thou an example of the believers" (1 Tim. iv, 12). The root idea of the

word, then, implies something antecedent to which a succeeding consequence corresponds, just as printer's type stands for the metal stamp to which the subsequent impressions correspond.

Two of these New Testament passages are of special importance for our present purpose. 1 Cor. x, 1-4, compares the passing of the Israelites under the cloud and through the sea to Baptism, the manna to spiritual meat, and the stream flowing from the stricken Rock to the "living water" given by Christ (St. John iv, 10); while the verses that follow (5-11) enumerate the sins of the Israelites which must be avoided. All these are our "*examples . . . written for our admonition*" (vv. 6, 11).

Heb. viii, 5, quotes the command given to Moses, "See that thou make all things according to the *pattern* shewed to thee on the mount," the earlier part of the verse asserting that these things—Tabernacle, priests, gifts—"serve that which is a copy and shadow of the heavenly things" (R.V.).

There are also passages which point in the same direction though the word for "type" is not actually used. Our Lord takes the lifting up of the Brazen Serpent as prefiguring His own uplifting on the cross (St. John iii, 14); the time of Jonah being in the "big fish" as answering to the period of His being "in the heart of the earth" (St. Matt. xii, 40); the manna given to the fathers as foreshadowing the "true bread of heaven," even Himself "the Bread of Life" (St. John vi, 22, 25). St. Paul finds in the narrative of Sarah and Hagar an "allegory" of the two Covenants. St. Peter (1 St. Pet. iii, 21) calls the saving of souls in the ark by water the "antitype" (R.V. *m.*) of Baptism. The Epistle to the Hebrews (vii, 1-3) compares Melchizedek, King of Righteousness and Peace, to "the Son of God."

We are justified, then, in believing that when our Lord spoke of all things "written in the Law of Moses and in the Prophets and in the Psalms concerning Me," besides referring to specific predictions, He was including all matters—persons or institutions—recorded in the ancient Scriptures which bore some reference to Himself and to His work. Hence it will be no mere effort of pious fancy if we trace in the Old Testament lineaments corresponding to those realities we find in the New.

Beginning then with the Persons of whom we read, we cannot be far wrong in taking the first parent of our race as a prototype of "the Son of Man," the Representative of all mankind, the "everlasting Father," for St. Paul sets the example when he

brings together " the first Adam . . . made a living soul " and " the last Adam . . . a quickening spirit " (1 Cor. xv, 45).

Abel, speedily brought before us by the history, " offered unto God a more excellent sacrifice." Slain by an envious brother, " being dead yet speaketh " (Heb. xi, 4). At once we think of the Innocent One, Keeper of His sheep, delivered to a shameful death by His own kinsfolk out of envy (St. Matt. xxvii, 18), yet in that very death offering to God an altogether acceptable sacrifice, wherein He speaks to all ages the message of peace and reconciliation.

Enoch, who " walked with the God and was not, for God took him " (Gen. v, 24), " had witness borne to him that he had been well-pleasing unto God " (Heb. xi, 5, R.V.). What is this but a shadow of Him Who " in the Beginning " was " with God," throughout His earthly life walked with God, of whom it was testified " in Whom I am well pleased," and finally was not for God took Him unto Himself.

Noah, whose name hints at comfort in toil and labour, also walked with the God, was " a righteous man and blameless in his generation " (Gen. vi, 9, R.V. *m.*), was " warned of God of things not seen as yet," of coming destruction, and " prepared an ark to the saving of his house " (Heb. xi, 7). A " preacher of righteousness " (2 St. Pet. ii, 5), unheeded and perhaps derided by a world intent only on " eating and drinking, marrying and giving in marriage," he was preserved to offer a sacrifice of " a sweet savour " to God, and to him was vouchsafed the rainbow token of mercy. He, of Whom the centurion said " Certainly this was a righteous man " (St. Luke xxiii, 47), is called our " Paraclete " (1 St. John ii, 1), the Comforter and Advocate of His people ; was verily a Preacher of Righteousness to " an evil and adulterous generation " ; was " despised and rejected of men " ; was warned of the terrible catastrophes to come when the world is again as it was in the days of Noah (St. Matt. xxiv, 37-39) ; has prepared an ark of safety for the family of the faithful ; offered to God the " sweet savour " of a perfect sacrifice, and revealed to His servant the vision of the rainbow glory of mercy round the Throne of justice.

To **Abram** (exalted father) the God of glory appeared " before he dwelt in Haran " bidding him leave his land to go " into the land which I shall shew thee " (Acts vii, 2-4). In obedience to this command Terah and his family migrated from Ur to Mesopotamia, yet this was only a preliminary stage in Abram's

journey. After the death of his father, he and his (including a number of home-born servants) had to set out again still "not knowing whither he went" save that it was to "the land of promise" which "he was to receive for an inheritance" (Heb. xi, 8), and in the end "into the land of Canaan they came" (Gen. xii, 5). Here with his armed servants he rescued his kinsman who had been taken prisoner. God makes a covenant with him and changes his name to Father of a multitude. Though a wanderer sojourning in tents he was no nomad sheikh of a desert tribe; his wanderings were not without purpose, since from time to time he built altars, offered sacrifice, and "called upon" (proclaimed) the name of Jehovah, making the true God known to the heathen. Throughout his conduct is marked by faith issuing in implicit obedience, and therefore he is called "the father of all them that believe" (Rom. iv, 11). When he died, he owned no part of the land of his inheritance except a grave in the rock-cave of Machpelah. He who has for one of His names "The everlasting Father" (Isa. ix, 6) left His home to sojourn in a far country, a wanderer with no place to rest His head, "tabernacled (tented) among us," proclaimed the Name of the true God Who is Spirit and Love, armed His followers with heavenly armour to rescue His kin from the slavery of sin, became the progenitor by the new birth of a family as numerous as the stars of heaven, was "obedient unto death" (Phil. ii, 8), and at His death owned only a grave "hewn out in the rock" (St. Matt. xxvii, 60).

Isaac, a son of promise (Gal. iv, 28) whose name suggests the pleasure given by his birth (Gen. xxi, 6), called an "only son . . . whom thou lovest" (Gen. xxii, 2), in whom the chosen Seed is called (Gen. xxi, 12), had his bride brought to him from kinsfolk in a distant land, had a well dug where water was found (Gen. xxvi, 32), and conveyed the special blessing of Abraham to his son. The "only begotten Son" (St. John, iii, 16), whose birth gives joy to the whole world, finds a Bride in the Church gathered from among His human kin (Eph. v, 32; Rev. xxi, 9), gives "a well of water springing up into everlasting life" (St. John iv, 14), and conveys "the blessing of Abraham" to men (Gal. iii, 14).

Jacob, "a plain (Heb. perfect) man, dwelling in tents" (Gen. xxv, 27), having received the Blessing of his father, set out on a journey to seek a wife; had a vision of angels ascending and descending; prospered greatly in a far land (Gen. xxx, 43)

and returned with a great family enriched with flocks and herds ; at the Jabbok, saw God " face to face," wrestled and, though lamed in the struggle, prevailed, and was given a new name Israel (a prince of God : Gen. xxxii, 28) ; bade his people put away false gods, and restored Bethel, the House of God. The truly Perfect Man, a dweller in tents among us (St. John i, 14), Who was indeed the Blessed of His Father, came from His home to seek His Bride in a far land ; to Him angels from heaven descended to minister to Him when He hungered in the desert, and again when He was in agony of spirit ; doing the work of a Shepherd, he took for His reward those who were " speckled and spotted " and gathered a great flock to Himself ; ever " face to face " with God, through His bitter strivings in which He was grievously maimed. He became a Prince of God, even the Prince of Peace : He, too, bids His own put away all false gods, and is restoring the House of God.

Joseph (the Lord takes away and adds), beloved of his father but envied of his brethren, was despoiled of his raiment, cast into a pit, sold to strangers, thrown on a false accusation into prison where he cares for the prisoners ; raised thence by the king, and promoted to great honour as the " Revealer of Secrets " before whom " Bow the knee " was cried ; he provided food for the famishing and a home for those who had derided and sold him. Those who had mocked him as a dreamer of dreams had to bow down before him. The " beloved Son " (St. Matt. iii, 17) was betrayed, sold for 30 pieces of silver, delivered to the stranger for envy, falsely accused, cast into the pit where He visited " the spirits in prison " (1 St. Pet. iii, 19) : He has been raised to honour by the King of Kings, enthroned at His right hand, is a " discerner of the thoughts and intents of the heart " (Heb. iv, 12) to Whom every knee shall bow (Phil. ii, 10) ; is Himself the Bread of Life to feed the hungry soul, and is preparing a place for His own (St. John xiv, 2).

Moses, saved in infancy from a massacre commanded by the king, was brought up as a prince, visiting his oppressed brethren was rejected by them, became a shepherd ; was commissioned to bring his people out of bondage ; led them in the wilderness ; received the Ten Commandments ; was a Prophet to speak the words of God ; brought water out of the rock ; led the campaign against the giants of Bashan ; brought the people to the confines of the Promised Land. The Infant of Bethlehem of royal lineage, was saved from the massacre ordered by Herod ; is the Good

Shepherd ; delivers from the slavery of sin ; gives a New Commandment ; speaks the words of God (St. John viii, 28 ; xiv, 49) being the promised Prophet like unto Moses (Deut. xviii, 18) ; was the spiritual Rock from which flows the Water of Life (1 Cor. x, 3) ; is the Captain of our salvation to defeat our great Enemy, and leads His people on to the Promised Land.

Joshua (the Lord the Saviour) was Moses' minister, captained the army against the Amalekites ; led the people over Jordan, overthrew the walls of Jericho, preserved the life of her who sheltered his messengers, suffered defeat for the trespass of his follower, yet in the end triumphed in victory, conquering the land ; established cities of refuge ; built an altar on Ebal, the mount of curses ; allotted the inheritance of the tribes, and renewed the Covenant at Shechem. **JESUS** (the same name in its Greek form) took the form of a servant and came "not to be ministered unto, but to minister" (St. Matt. xx, 28), yet is Captain of the Lord's hosts, strong to the overthrowing of strongholds, and to spare those who receive His messengers. He suffers defeat in the transgressions of His followers, yet conquers the Land of their inheritance, allotting to each his share therein. He provides a safe Refuge for those who flee to Him, erects an Altar of sacrifice on the very hill of the accursed tree, and just before His death initiates the New Covenant.

Gideon (one who breaks or cuts asunder) was threshing wheat in the winepress when he was given the task of ridding the land from the Midianite oppressors. He builds an altar called Jehovah-shalom (the Lord is Peace) and is enjoined to throw down the altar of Baal. He asks to be given a sign in that the fleece may be wet with dew when all is dry, and dry when all else is dewy. He collects a large army, but is only allowed to use a very few, with whom nevertheless he puts to flight the immense hostile force, flashing the torches that had been hidden, and shouting the war-cry "The sword of the Lord and of Gideon." The Breaker who was to come up before Israel (Micah ii, 13) to break "the gates of brass and cut the bars of iron in sunder" (Ps. cvii, 16) trod the winepress alone (Isa. lxiii, 3), and thoroughly purged the floor in order to "gather His wheat into the garner" (St. Matt. iii, 12). He built the altar of the Lord our Peace, and threw down that of the Baal, who had so long been Master of mankind ; with a chosen few He scattered the giant forces of heathenism, though only equipped with the torch of truth, and armed with "the sword of the Spirit which is the word of God" (Eph. vi, 17).

Samson (shining like the sun) was a Nazirite, consecrated from his birth, strong when "the Spirit of the Lord came mightily upon him" (Judges xiv, 6) to rend the lion or to slay a thousand of his foes. Betrayed by one he had loved, he is shorn of his strength, captured by his enemies, bound and thrown into "the prison house." Brought into the temple of the false god to make sport for the crowd, he bows himself with strength now restored, the pillars yield, the building falls, and at his death he slew "more than those he slew in his life" (Judges xvi, 30). As foretold by the prophet (Mal. iv, 2) in due time the Sun of Righteousness arose, even He Who was the Light of the World. From His birth He was consecrated to the Lord, presented duly in the Temple (St. Luke ii, 22). On Him at His Baptism the Spirit descended visibly (St. Luke iii, 22) and in that Spirit's might He went forth to battle single-handed with the Evil One who walketh about "as a roaring lion" (1 St. Pet. v, 8), and in that strength could prevail over a thousand. Betrayed by His own familiar friend, He was taken captive, bound, mocked, and consigned to the dungeon of the grave, yet in and by that death He won the final victory.

Samuel (heard of God), whose mother sang a Magnificat (1 Sam. ii, 1), was in the House of God as a child, and, called by the Lord, was obedient to the call. He grew, "and the Lord was with him, and let none of his words fall to the ground" (1 Sam. iii, 19), so that he was established to be "a prophet of the Lord." After a victory, he set up a stone of Help (Eben-ezer). For long he judged, that is ruled, Israel, and could challenge them to bring any accusation against him. At the urgent insistence of the people, he sets a king over them, and when that king proved unfaithful, warned him that the kingdom would be taken from him, and given to another. Magnificat was sung by the Virgin-Mother, expecting the birth of One Who was ever heard of God. In His youth He was found in His Father's house about His Father's business. He "grew and waxed strong in spirit, filled with wisdom, and the grace of God was upon Him" (St. Luke ii, 40), so that He came to be recognized as "the Prophet of Nazareth" (St. Matt. xxi, 11). He was the "living Stone . . . chosen of God and precious" (1 St. Pet. ii, 4) on Whom the faithful are builded, and therefore for them "a very present Help in time of trouble." He had to warn the Jews "The kingdom of God shall be taken from you and given to a nation bringing forth the fruits thereof" (St. Matt. xxi, 43).

David (Beloved) while a shepherd lad protected the flock and, still "a stripling" and unarmed, met and slew the giant Philistine champion. A minstrel and sweet singer he charmed away the evil spirit from Saul. Already anointed to the kingdom, his successes and popularity made Saul jealous, so that he was driven away to take shelter in the wilderness and caves. When he had become king over all the tribes, driving off the Philistines, he seized the Jebusite stronghold on Zion to be the nucleus of "the city of David," the capital of the whole nation. Political unity thus secured, he next made it also the centre of religious unity by bringing thither the ark of the covenant. Later on trouble arose in his own family, his favourite son Absalom conspiring against him so that he had to retreat to the other side of Jordan. He purchased the threshing floor of Araunah, saying "This is the house of the Lord God" (1 Chron. xxii, 1). Not permitted to build the House itself, he secured the site for it, and then set himself to collect a great store of materials for its erection. The "Son of David," the "Well-beloved," was the "good Shepherd" to protect His "little flock." Alone He met and overcame the giant foe, who defies the Lord of Hosts. He had power to drive out evil spirits from the lives of those they had mastered; He was the Messiah, anointed of the Lord; assailed by the jealous envy of the rulers, He was a wanderer, and for a time took refuge beyond Jordan. He stormed the citadel of evil, garrisoned by "the blind and the lame," and made it the beginning of the Holy City, the new Jerusalem. He brought in the New Covenant: His fan was in His hand to purge the threshing floor, fitting it as the place for the spiritual Temple, and with His own Blood He purchased the souls for its erection.

Solomon (peaceable, or perfect, or recompenser) asked for wisdom rather than wealth or long life. Wisdom was granted him, so that he became a discerning judge; wealth was added, and treasures from far lands flowed into his treasury; royalty visited him, and "all the earth sought to him to hear his wisdom" (1 Kings, x, 24); he spake many proverbs (similitudes) and discoursed of all trees and animals (1 Kings iv, 32, 33); long life and wide dominion were given him; he builded the Temple, his Palace and his "ascent by which he went up unto the house of the Lord" (1 Kings x, 5). The Prince of Peace, the "greater than Solomon," is the Perfect One, and the Rewarder of all that diligently seek Him. Of Him it was said "What wisdom is this which is given unto Him?" (St. Mark vi, 2), He

is called "the wisdom of God" (1 Cor. i, 24), and one of His Names is "Wonderful Counsellor"; He is appointed Judge of the living and of the dead, and is "a discerner of the thoughts and intents of the heart" (Heb. iv, 12); He spake in parables, and often of the things of Nature; men of all races, nations, and languages have flocked to learn true Wisdom from Him, and in Him are found the unsearchable riches of grace and glory (Eph. iii, 8, 16); all authority in heaven and earth is given to Him; He is the one Foundation and chief Corner-stone of the true Temple; one of His parting words is "Peace I leave with you, My Peace I give unto you" (St. John xiv, 27).

Isaiah (salvation of Jah) saw the vision of the Lord on the throne high and lifted up, and heard the adoring anthem of the seraphs; was sent with a message of warning to the people, and announced the destruction of the Assyrian army; conveyed a message of healing and life to the dying king, and tells of the suffering Servant of the Lord, and of the One anointed to preach good tidings. The "Captain of salvation" (Heb. ii, 10) and "Author of eternal salvation" (Heb. v, 9) saw the heavens opened, and enabled His servant to see the "throne set in Heaven," and to hear the ceaseless tribute of praise, "Holy, Holy, Holy" (Rev. iv, 2, 8). He had to deliver messages of warning to those whose eyes were blinded and hearts hardened (St. John xii, 40; Isa. vi, 9, 10), warnings of judgement to come, yet was also both the Servant to suffer and the Anointed "to preach good tidings to the meek" (Isa. lxi, 1). His words are words of healing and life even to the dying.

Jeremiah (exaltation of Jah), markedly a prophet of woe, was of a tender, gentle nature, constantly saddened by having to deliver dark warnings of troubles to come: for the people, a sentence of captivity and exile; for city and temple, destruction and ruin; for three of the kings, miserable endings. Still, occasionally, there are gleams, as when he told that the captivity would be limited to 70 years, and particularly when he foresaw a wondrous restoration under a King whose Name is "The Lord our Righteousness" (xxiii, 3-8). Often opposed by false prophets who averred that his messages were not the word of the Lord, he was threatened with death because he had "prophesied against this city" (xxvi, 11), though that would bring the guilt of innocent blood on themselves (v, 15); he was imprisoned and cast into a miry pit where was no water (xxxviii, 6); he uttered pathetic Lamentations over the city and nation.

The gentle and loving "Man of sorrows and acquainted with grief" uttered many woes on scribes, Pharisees, and lawyers as hypocrites, and on Chorazin, Bethsaida and Capernaum. He also was opposed by those who said He was not sent by God, was put in prison and the waterless pit of the grave; He uttered warnings of the destruction of City and Temple, and wept over Jerusalem. He was put to death and His innocent blood has been visited on those who were guilty.

Ezekiel (God will strengthen), a priest, captive, and exile, again and again called "Son of Man," was shown the departure of the Glory from the Temple, and the abominations that had defiled it; was sent to "a rebellious house" (ii, 5) to warn them whether they would hear or forbear; declared the downfall of many great powers; saw Israel as a valley of dry bones, yet to be revived; and was shown a vision of a transformed city and Temple, priesthood and land, under the rule of a "Prince in Israel" (xlv, 16). "The Son of Man," the Priest to offer the supreme sacrifice and the Prophet sent to "an evil and adulterous generation" (St. Matt. xii, 39), saw and cleansed the Temple courts which had been made "a den of thieves." At His "exodus" the true Glory of the Temple (Hag. ii, 9) removed. He sent the Spirit, the life-giving Breath of God, to breathe life into the dry bones of mankind, and is Himself the Prince to rule the new earth wherein will be the new Jerusalem and the temple of the Lord God and of the Lamb (Rev. xxi, 22).

Daniel (God my Judge) "of the King's seed" was brought "to stand in the King's palace" (i, 4), but refused the king's meat and wine, choosing rather pulse and water. He had "understanding in all visions and dreams" (i, 17), interpreting two of Nebuchadnezzar's dreams and the handwriting on the wall of Belshazzar's palace. On the accusation of the notables, he was thrown into the den of lions which was sealed with the royal signet, but was delivered unhurt by the king himself and promoted to honour. He wrote for ages to come the vision of the Son of Man brought to the Ancient of days to receive everlasting dominion; the angel's message announcing the coming of the Messiah the Prince, His being cut off, the destruction of city and sanctuary, and the ceasing of sacrifice and oblation; and also of the time when many that sleep in the dust shall awake. Half his book is in Aramaic and half in Hebrew. That Messiah, the Prince, though of royal lineage, passed His earthly life in poverty; was noted for understanding and wisdom;

was accused by the chiefs of His people of disloyalty to Cæsar, thrown into a rock tomb whose entrance was sealed, but was delivered alive by the King of Kings, and as Son of Man was brought before the ever-living One to be enthroned and given a dominion "which shall never be destroyed" (ii, 44). He taught His disciples of the time when those in the grave shall come forth (St. John, v, 29), and Himself is God the Judge. He may have spoken to multitudes in Aramaic, but to the doctors in the Temple and before the Sanhedrim would surely have used the sacred Hebrew.

Ezra (Helper) was privileged to lay the foundation of a new Temple and eventually completed it, though not till after a long delay caused by the opposition of adversaries. Also he read the book of the Law of Moses to the people and had it interpreted for them. He Who was sent to be our Helper laid the foundations of the spiritual Temple in His Apostles, and will complete it though as yet that is delayed by the wiles of His enemies. He also has expounded the true meaning of the Law for us.

Nehemiah (comfort of Jah), having obtained leave to repair the city of his fathers, surveyed the ruins under the cloak of night, and encouraged his companions in the work of rebuilding it, though they had to do so armed against the assault of enemies. He also cleared the people from the reproach of intermarriages with the heathen. He Who is called our "Paraclete" (Comforter, 1 St. John, ii, 1) surveyed the ruinous state of the city of God amongst men while cloaked by the mantle of His humiliation. For the work of building up the walls, He arms His followers with the sword of the Spirit which is the word of God; and from time to time has cleansed His church from being wedded to errors of heathen philosophies.

It may be objected that in all this attention has been drawn only to the favourable features in these characters, and nothing is said of their faults, though several of them were worthy of blame, and David in particular was guilty of gross crime. True, all of these were human with human faults and failings, and therefore none of them could be wholly like Him who alone was without sin. But a shadow never adequately represents the reality: it can only indicate something of its form. It is enough if these persons, in their best and most remarkable characteristics, show some resemblance to the Person, Life, and Purpose of Him who is undeniably the climax of the whole history. Since our

lengthy list includes most, if not all, of the really prominent figures in the Old Testament, it looks as though these have been selected for detailed record just because of the resemblance they bear to the chief Figure of the New. If so, that shows a common aim and purpose governing all these narratives, so varied in themselves, coming from so many different minds of men living at widely different ages.

From the personages of the Old Testament we may now turn to the institutions.

Sacrifice comes first, since we meet with it at the very beginning, again after the deluge, and repeatedly in the lives of the patriarchs. Yet there is no explicit record of its being instituted, or of how or why it originated. The fact that Abel's offering of the firstlings of his flock was accepted when Cain's offering of the fruit of the ground was rejected suggests the thought that the essential point of sacrifice must be that of life, not merely any valued possession. The fact, too, that both brothers thought it incumbent on them to make an offering to God suggests the probability that they had received some previous intimation that this was expected from them. Now the coats of skins made for our first parents must have been taken from dead animals, and it is at least possible that Adam may have been taught to slay them in sacrifice. If the coverings for the ashamed sinners were taken from sacrificed animals, it would give point to the Hebrew word for "atone" which literally means "cover." As Abel's offering was from the flock, it would seem that already there was some indication as to what animals were suitable for sacrifice, which would account for the distinction between clean and unclean being known to Noah. Sacrifice then involves the taking of a life, and the severest test of Abraham's faith was the command to offer up his "only" son. Such sacrifice is the key-note of the work of the only begotten Son of the Father. He sacrificed the glory and bliss of heaven to become Man. He lived a life of self-sacrifice on earth; of His own free will He gave up that life when He breathed it upon the Cross.

Circumcision comes next, and that we are told was ordained of God as the sign and seal of a covenant relationship with God Himself (Gen. xvii, 10). As it was to be performed on infants of a week old, it is clear that this relationship is conferred by the grace of God independent of any human qualification, and this has ever been taken by the Christian Church as a sanction for

admitting infants to the new Covenant by Baptism. The maintenance of that covenant relationship depends on the circumcision of the heart enjoined in Deuteronomy (x, 16) and insisted on by St. Paul (Rom. ii, 29).

Of the ordinances instituted at Sinai, the foremost is the **Tabernacle**. For this there are two designations in Hebrew : *Mishkan*, Dwelling, and *Ohel Mo'ed*, Tent of Meeting (or Appointment). St. John (i, 14) tells us that the Word "dwelt (tabernacled) among us," and St. Paul (Col. ii, 9) that "in Him dwelleth all the fulness of the Godhead bodily." In the Incarnate Word then was the appointed Meeting-place of the Divine and human. When the Tabernacle was complete and erected "a cloud covered the Tent of Meeting and the glory of the Lord filled the Dwelling" (Exod. xl, 34). In the Tabernacle there were two parts : 1st, the Holy of Holies, where was the Ark of the Covenant, covered by the Mercy Seat overshadowed by the wings of the Cherubs where was the Divine Presence (Ps. lxxx, 1) ; and 2nd, the Holy Place, where were the seven-branched Candlestick, the Table of Shewbread, and the golden Altar of Incense. So in the Tabernacle of the Incarnate Word there was that sacred Presence of the Godhead where none might enter save the High Priest Himself, and that outer life accessible to others where are found the Light of the world, the Bread of Heaven, and the sweet Incense of infinite Merits. In the outer court were two important accessories : the Laver where priests washed before they commenced their duties, and the great Altar of Sacrifice. We who have been chosen to be "a royal priesthood" (1 St. Pet. ii, 9) need to be cleansed, and "the blood of Jesus Christ cleanseth us from all sin" (1 St. John, i, 7) in "the washing (R.V. *m.* laver) of regeneration" (Tit. iii, 5). We, too "have an Altar" to "offer the sacrifice of praise to God" (Heb. xiii, 10, 15). The Levitical sacrifices were divided into three classes :—(i) the **Burnt Offering** (the Hebrew word means that which ascends), also called "whole" (Deut. xxxiii, 10), which was entirely consumed in the fire ; (ii) the **Peace Offering**, whose special feature was that part was eaten by the worshipper ; (iii) The **Sin and Trespass Offering**, the main part of which was burnt "without the camp" (Lev. iv, 12). Subsidiary to these were the **Meat** (Meal) Offering of fine flour, and the **Drink Offering** of wine. It needed each and all of these to set forth different aspects of the true Sacrifice. That of our Lord was "full, perfect, and sufficient" because it was the

surrender of all that He was and had, entirely consumed in the fire of His zeal, and therefore answered to the "whole" offering which went up to heaven. It was a Peace Offering in that it reconciled God and man, and as such the worshipper was entitled to have his share, wherefore our Lord gave the broken bread, saying "Take, eat, this is My Body" (St. Matt. xxvi, 26). The Holy Communion then is not in itself a Sacrifice but the feast on a portion of one. That was a Sin-offering "which taketh away the sin of the world" (St. John i, 29), and therefore was offered "without the gate" (Heb. xiii, 12). The meal and drink offerings have their counterpart in the bread and wine distributed by Him Who was "an high priest after the order of Melchizedek" (Heb. vi, 29). The Israelites were forbidden to touch blood, even that of the sacrifices, because that was the blood of animals, and "the life (soul) of the flesh is in the blood" (Lev. xvii, 11). Now that it was a matter of Divine (not animal) life, the Giver could say "Drink ye all of it: for this is My Blood of the New Covenant" (St. Matt. xxvi, 27, 28).

The **Passover**, a special sacrifice not offered on any altar or in any sanctuary, had also its significance. Our Lord's offering was made at the Passover season; He is called "Christ our Passover" (1 Cor. v, 7); it is significantly recorded that, as in the case of the Passover lamb, no bone of Him was broken; and His blood is the signal to the destroying angel to "pass over" the household of the faithful.

For the Daily Sacrifices, one lamb was offered in the morning, and another at even (Num. xxviii, 4); the offering of "the Lamb of God" began at the third hour of the morning and ended at the ninth (St. Mark xv, 25, 34), about the hour of the evening sacrifice.

On the Day of **Atonement** the High Priest entered into the Holy of Holies; so the Christ has passed "into heaven itself, now to appear in the presence of God for us" (Heb. ix, 24). The High Priest had to lay aside his gorgeous robes and be clad in white linen (Lev. xvi, 4); so did our High Priest lay aside His royal robes of heavenly glory to put on the garb of a sinless humanity, and in the end, stripped even of human raiment, was clad only in His spotless innocence. On that Day there was a double offering: one goat a sin offering for the people, and another to have those sins laid on its head and let go into the wilderness (Lev. xvi, 21). These typified the twofold aspect of our Lord's work. He was both slain for our sins, and also the

Scape Goat to be dismissed into "a land not inhabited." Lastly, the High Priest was in an especial sense the anointed Priest; our Lord claimed for Himself, and has been accorded even by unbelievers, the title "Christ" which is but another form of Messiah, the Anointed. Himself anointed with the Holy Ghost (Acts x, 38), He has conferred that anointing on His followers, so that we too have "an unction from the Holy One" (1 St. John ii, 20), even as "the precious ointment upon the head (of Aaron) went down to the skirts of his garments" (Ps. cxxxiii, 2).

I am well aware that I have only been able to offer you an outline of a subject too vast for a single paper; nor have I consulted any of the recognized works on Typology, thinking you would prefer an independent examination of the subject. Much of what has been here said has no doubt been said before and better, yet perhaps I may have been enabled to pick up a few crumbs which others have passed by.

DISCUSSION.

The CHAIRMAN (Mr. A. W. Oke), in a few hearty words, called for a vote of thanks to the lecturer, and the same was accorded with acclamation.

Mr. PERCY O. RUOFF said: No one who has read the paper can question the skill, the power or the reverence with which the subject has been presented. There is special need of sanity in handling the matter, as the most fantastic and irreverent interpretations have often been affixed to types in the Bible. It is perhaps rather difficult to understand why Mr. Finn should select from the career of Jacob (p. 203) the incident of the "speckled and spotted" flock, as setting forth in type Christ's spiritual flock. The lecturer has cited several prominent Old Testament characters as types of Christ. He did not mention Job. Was Job such a type? If so, in what respects, and to what extent? Are striking points of resemblance to Christ alone to be selected to establish a type? What is to be said about the contrasts? This raises an important question. There can be no

doubt that in every case where the Scripture affirms a type we are on safe ground. How far is an interpreter justified in going beyond what is expressly stated to be typical? It would be helpful and illuminating if Mr. Finn can furnish some principles or canons which will be sure guidance for discovering and interpreting types.

MR. G. WILSON HEATH said: I have often wondered how intelligent Christian men could question the typology of the Scriptures, but they do so. That God was most graciously teaching men fundamentally divine truths in those early "Kindergarten" days of the world's history by such means, I see no way or reason for doubting. Those were the days of shadows; we in God's grace and mercy live in the days of the substance, the antitypes. Of course, we must not value or measure the substance by the shadow, but *vice versa*.

I hardly think that the men whose names have come before us, in the paper read, ever dreamed that in their persons and detailed life-histories, they were weaving the beautiful tapestry of a "type." I hardly think that conscientious Israelites, who, it may be, endeavoured to satisfy the urgent requirements of the ceremonial Levitical law, by ordinances, offerings and sacrifices—requirements which would occupy most of their time from morning to late at night, and every day of the year (and all of which together could never take away sin)—ever understood the true typical character of all they did. They simply, I suggest, obeyed the divine injunctions. The wonder of it all is that these things happened, are recorded, and have been preserved, for our admonition and instruction, upon whom the end of the ages has some, and this for the help of a fore-known and foreordained people in the purpose of God, before the foundation of the world. All this to me is very wonderful!

May I say that I think the first type mentioned in the Bible, and possibly the most arresting—and certainly for us to-day the most profound (I am not sure if the word "type" is the accurately correct word for it), and which needs the Holy Spirit's help in a special way to enable us to understand it, and thus sound one of "*the deep things of God*"—is that which the lecturer indicated by a reference to Eph. v, 32, but which he did not expound to us. On p. 202 of the paper, "Isaac" is under review, and that incident in his life is mentioned when Abraham instructed the "eldest servant of his house" to take a long journey in order to find a bride for his son.

{Gen. xxiv.) The instructions, as we know, were definite, and given under a solemn oath, "thou shalt go unto my country, and to my kindred and take a wife unto my son Isaac," and this the servant swears to do by "the God of heaven and the God of the earth." "Thou shalt not take a wife to my son of the daughters of the land among whom I dwell." The lecturer very rightly says "the bride for Isaac was to be gathered from among his human kin" not from the Gentiles.

The Evangelist John is the only writer in the New Testament who deals with this type, or mentions the "Bride." In the Revelation John again and again mentions "the Bride, the Lamb's Wife," which of course refers to a special election out of Israel in the "last days." It would be mixed metaphor or type indeed, if St. Paul, who never mentions the Bride, did so when unfolding "the Mystery, the Church which is Christ's *Body*." Therefore I suggest that the reference which the lecturer makes on p. 202 to Eph. v, 32, indicates something far deeper surely than Isaac's Bride, or John's "the Bride, the Lamb's Wife." It takes us back to Gen. ii, 21, and to the "deep sleep" which fell upon Adam, when the rib for the Isha was taken out of the side of Ish, "and of it the Lord builded a woman"! This mystery indeed is great! A woman out of a man! "bone of my bones, and flesh of my flesh." (Gen. ii, 23.) When? "In the deep sleep"—"dead with Christ," "quicken together with Christ, raised up together with Christ," "seated together with Christ," "*One Body*," "bone of His bones and flesh of His flesh." This certainly is not Bridal language, but identity and identification. Not union or unity, but Oneness. "This is the great mystery!" and one perchance we may not desire to look into too scrutinizingly.

Col. F. A. MOLONY said: It is clear that we are entitled to point out that one thing appears to us to be like another thing, but if we go on dogmatically to assert that Almighty God meant this to be like that, we get on to very dangerous ground. Yet when a number of types are brought together, as in this very able paper, then we do feel assured that God meant some of them to be like their antitypes—otherwise why should there be so many? I myself cannot see how the deep and glorious truths of the atonement could have been taught to men without the use of pictures. Preaching from these types seems to be unfashionable now. Ought we not to try and

bring it back into fashion, and to this end should we not put Mr. Finn's useful paper among our books of reference ?

Mr. HOSTE remarked with reference to the paragraph at bottom of p. 200, that it is permissible to go further than the lecturer allows himself—"We cannot be far wrong, etc."—for in Rom. v, 14, the first Adam is actually asserted to be "the figure (*tupos*) of Him that is to come." As for the typical connection between circumcision and baptism, which the lecturer seeks to establish, in no controversial spirit, on the ground that the former is said to be "the seal of the covenant," I would ask, is this exactly accurate ? I believe there is only one place where circumcision is termed a *seal*, namely, Rom. iv, 11, and then not of a covenant, but of the righteousness of the faith, which Abraham had, being yet uncircumcized. Is it not clear that no infant has any righteousness at eight days old ? Certainly circumcision was the *sign* of the covenant, and was administered to new-born babes in Israel. Many believe that baptism is applicable alone to "new-born babes" in the family of God ; *i.e.* to those who have lately believed in Christ, whatever their age. As for the "Hebrews," the author of that Epistle speaks of the priests as "serving under the pattern (*hupodeigma*) and shadow (*skia*) of heavenly things" (ch. viii, 5), and this is explained in the following words—as "the pattern (*tupos*) shewed to thee in the Mount." So the whole of the tabernacle and service are typical. The character of pattern seems to attach to the construction of the tabernacle and its furniture (ch. ix, 23), which are the "figures (*antitupos*) of the true"; and "shadow," to the ceremonial—*sacrifices* (ch. x, 1), and meats, drinks, holy days, new moons and sabbath days, "which are a *shadow* of things to come, but the body is of Christ." (Col. ii, 16, 17.)

Lt.-Col. A. G. SHORTT said : I would ask the lecturer if he thinks it altogether wise, as he has done on p. 209, to put aside the points of difference, and concentrate all attention on the similarities. We find a good deal in the lives of each of these Old Testament characters which does not find an echo in the earthly life of Christ, and this, in many cases, not merely because of the frailty of human nature. Might it not be better to consider, not the complete individual as a type, but rather such episodes only in their lives which correspond ?

This would entail the idea of allegory rather than of type, and certainly there are cases where we find every detail of the episode reproduced in the future, so far as the symbolism will allow.

And there is another point. Are we sure that all these characters find their true fulfilment in the life of Christ? May it not be that *both* are following out a law, and *both* pointing to events which may be even yet in the future? Many people trace a typical connection between Christ and Israel, and certainly this would account for the difficulty found in separating the two in the Suffering Servant chapters of Isaiah. Without going into details, however, I welcome the paper because, if it be conceded that these connections are real, they constitute one line of proof of a certain kind of prophetic revelation which cannot be accidental, and it is very desirable that the subject should be followed up, sorted out and classified, to see how far it will lead us.

Mr. GEORGE BREWER said: Wonderful indeed is the teaching conveyed by the types given to us in the Scriptures; and while we should endeavour to learn all we can from each, there is sometimes a tendency to press analogy beyond the manifest intention of the Holy Spirit. All teaching centres in, and radiates from the glorious Person and Work of the Lord Jesus Christ; and it is because these glories are so wonderful and infinite, that no human type or figure is sufficient to portray them as the Holy Spirit would reveal them to us. From the very beginning the creation and manifestation of natural powers and elements become types of God's new creation; so that we can realize and rejoice in the fact that "God, who commanded the light to shine out of darkness, hath shined in our hearts, to give the light of the knowledge of the glory of God in the face of Jesus Christ." (2 Cor. iv, 6.)

Often a type is conspicuous for its contrast to the antitype: as the first Adam, who was given dominion over God's creation is conspicuous for his failure, so the last Adam was conspicuous by His triumphant success. Abel, whose blood cried unto God from the ground, and who could not redeem the sin-stained earth, nor give to God a ransom, was but an imperfect type of the One who, on Calvary's cross, vindicated God's righteousness, and obtained for us eternal redemption by the shedding of His precious blood, which "speaketh better things than that of Abel."

Isaac, a type of submission to, and agreement with his father's will (they went both of them together, Gen. xxii, 8), is also a type of the resurrection from the dead, whence we are told (Heb. xi, 19) Abraham "received him in a figure." Jacob, who in spite of all his faults and failures, by His prevailing dependence upon God became *Israel*, a prince with God (Gen. xxxii, 27), pointed to that perfect antitype, who as the Author and Finisher of faith, living a life of perfect dependence upon God, was exalted to be a Prince and a Saviour to give repentance and remission of sins. (Acts v, 31.) Joseph, rejected by his brethren and cast into a pit, became their saviour from death; Moses type of our Lord, as the prophet whom God would raise up to bring, not the law, which was to death, but grace and truth to eternal life. Aaron was figure of Him who by virtue of His own blood entered into heaven itself, there to appear in the presence of God for us, even Jesus, made a high priest for ever after the order of Melchisedec, type of an eternal and unchangeable priesthood, King of righteousness and King of peace. (Heb. vii, 1-3.)

The great sacrifice of Calvary was typified in the Mosaic ceremonial law by five separate offerings:—The burnt offering denoting our Lord's perfect obedience and submission to His Father's will; the meal offering of fine flour, His perfect sinlessness; the mingled oil, His anointing by the Holy Spirit without measure; the peace-offering—peace with God by the blood of His cross; the sin-offering, of His being made sin for us, that we might be made the righteousness of God in Him; the trespass-offering, the bearing of our individual sins in His own body on the tree. And what applies to the Lord Jesus Christ applies also, in less measure, to the Church as united to Him.

In the Epistle to the Ephesians the glorious character and destiny of the Church, together with the responsibility of its members to their Head and to one another, are grouped under three figures: *the Body* denoting perfect organism, each member in submission to and under the direction and control of the Head (Eph. iv, 16); *the Temple*, perfect stability of structure and designed to be the habitation of God through the Spirit (Eph. ii, 19-22); and *the Bride*, perfect beauty and holiness of character, the object of perfect love and sacrifice on the part of the Heavenly Bridegroom (Eph. v, 23-32). In the first figure, the Body is typified in the Old Testament

by the assembly of Israel brought out of Egyptian bondage ; delivered from judgment by the blood of the slain lamb ; led by Moses, here type of the Holy Spirit, through the wilderness to the promised rest. The second, the Temple, by the Tabernacle and Solomon's temple ; the one revealing the pilgrim character of the Church ; the other, the stable character of the building against which our Lord assures us the gates of Hades shall not prevail (Matt. xvi, 18). Of the third, the Bride, we have a number of types :—The first, Eve, taken from the side of Adam, bone of his bone and flesh of his flesh, denoting origin (Gen. ii, 21–23) ; Rebecca, called out from a far country, being sought and found by Abraham's servant (type of the Holy Spirit, Gen. xxiv), as wife for Isaac, whom having not seen, she loved. Asenath, the Egyptian wife of Joseph (Gen. xli, 45) ; Zipporah, the Midianitish wife of Moses (Exod. ii, 21) ; Ruth, the Moabitess, wife of Boaz. These, as well as many others, might be cited, revealing the various nationalities of the brides of men, who are admittedly types of the Heavenly Bridegroom, the members of whose Church are called out from the world, Jew and Gentile, irrespective of nationality, to be at last presented to Himself a glorious Church, not having spot or wrinkle or any such thing, but holy and unblemished (Eph. v, 27).

WRITTEN COMMUNICATION.

Rev. J. J. B. COLES wrote : Mr. Finn's excellent paper should help on the revival of this important section of Scriptural study—“ The elucidation of the doctrine of the types, now entirely neglected, is an important problem for future theologians ” (Hengstenberg).

Sir Robert Anderson in his valuable book, *The Hebrews Epistle, in the Light of the Types*, quotes the above extract. Types of the “ things concerning Himself ” belong to the living oracles of God, and ever afford spiritual food for our hearts and souls. Types of the Chosen People's history, past, present and future, such as are delineated in the fig, the olive, and the vine, are of lasting value, and will be of increasing use (perhaps) in the not far distant future. The much-loved story of Joseph and his brethren is an unfinished

history, as we all know, and will be ultimately fulfilled when the Redeemer shall come to Zion, and when He that scattered Israel shall gather him as a Shepherd does his flock.

REPLY BY THE LECTURER.

The Chairman emphasized the advantage of having some knowledge of the languages in which the Bible was written. Many, however, are under the impression that the study of Hebrew is exceptionally difficult. In reality, that language is less complex than Greek, and, when once the initial difficulty of learning the unfamiliar character is overcome, it is fairly easy to get a tolerable working knowledge of it. My own belief is that the intricacies of voice, mood, tense, accents and so on, which often dismay beginners, are really due to the over-subtle refinements of mediæval rabbis and German grammarians, who have tried to reduce to hard and fast rules the inevitable freedom of writers.

Some mention was made of the value of the Septuagint. For a good many years I have been at work on a minute comparison of the Hebrew, Greek, and Samaritan texts of the Pentateuch, and it has convinced me that the Greek version is often unreliable. The translators seem sometimes ignorant of the meaning of the Hebrew words; sometimes to render so freely as to be misleading; sometimes to insert passages that do not properly belong; and sometimes to omit parts that are of some importance.

For the New Testament Greek (the common, *Koinē*, not the classical) is needed, but even here some knowledge of Hebrew is useful. Apart from marked Hebraisms found in St. Matthew's Gospel and in the Book of Revelation, there are possibly some indications of Hebrew influence. For instance, in Greek where two nouns are in "construction," the latter of the two words is modified, whereas in Hebrew it is the former, and then that word cannot take the definite article. When, then, St. Paul sometimes writes "Spirit of God" without the article, this need not mean *a* spirit undefined; it may only be that the Apostle, a Hebrew of the Hebrews, saturated with Jewish thought, has unconsciously followed the Jewish idiom instead of the Greek.

Two of the speakers dwelt on the possible danger of carrying typology too far, quoting fantastic instances. Vagaries like these are not confined to modern times, similar fancies being found in early writings, as in Origen. One speaker asked if there was any principle to which we must adhere, and another thought we ought not to go beyond the types actually specified in the New Testament. That seems to me too narrow a restriction, since the instances there given would rather stimulate us to note other resemblances. What is needed is a reverent spirit, guided by outstanding characteristics, and not assuming that every tiny detail in the Old Testament histories (such as the number of Abram's followers, or Rahab's scarlet thread) must always have some hidden meaning.

Mention was also made of the possibility of finding in the wives recorded in the Old Testament types of the Church as the Bride of Christ, and special reference was made to the union of Adam and Eve. It may be that profitable lines of thought may be found in this direction, but a paper like mine could not contain everything.

One speaker found some difficulty in the mention of "speckled and spotted" on p. 203. It was intended to suggest that, as Jacob deliberately chose for his share the animals that might be thought blemished, so our Lord included the sinful in His flock.

It is no doubt true that Abraham "received the sign of circumcision, a seal of the righteousness of the faith" he had (Rom. iv, 11), but that does not apply to his descendants. For them it is ordained, "he that is eight days old shall be circumcised . . . the uncircumcised man child . . . shall be cut off from his people; he hath broken My covenant" (Gen. xvii, 10-14). Throughout the chapter, stress is laid on the "everlasting covenant" between God and His people, and admission to this is granted to unconscious infants.

747TH ORDINARY GENERAL MEETING,

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL,
WESTMINSTER, S.W.1, ON MONDAY, MAY 18TH, 1931,

AT 4.30 P.M.

R. G. K. LEMPFERT, ESQ., C.B.E., M.A., PRESIDENT OF THE
ROYAL METEOROLOGICAL SOCIETY, IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed, and signed, and the following elections were announced. As Associates: the Rev. Alfred Mathieson and William H. Hobbs, Esq.

The CHAIRMAN introduced Dr. C. E. P. Brooks, Secretary of the Royal Meteorological Society, to read his paper on "Climatic Changes since the Ice Age."

CLIMATIC CHANGES SINCE THE ICE AGE.

By C. E. P. BROOKS, D.Sc.

THE subject of climatic changes during the past ten thousand years or so is of great importance. Such changes form the background of history, deteriorations of climate causing waves of unrest and migration, while more favourable conditions allow of the undisturbed development of civilization. They have dominated the migrations of animals and plants, without which, for example, our woodlands must have presented a far more monotonous and less pleasing aspect than they do.

Soil types have also been affected, especially by the growth of extensive peat bogs. The amount of attention which scientists have devoted to these changes is unfortunately not commensurate with their importance, probably because they form a border-line study in which history, geology, meteorology, archæology and botany all play a part. What is everybody's business is proverbially nobody's business, and for this reason the account which I am able to give you is still in many respects tentative.

1.—THE CLOSE OF THE ICE AGE.

When after the last great advance of the ice-sheets into temperate regions the final amelioration of climate set in, there followed a long stage of melting and retreat, interrupted by occasional temporary re-advances of the ice. It is convenient, however, to select some definite point in this protracted period of retreat as marking the "official" end of the Ice Age, so geologists have agreed to date post-glacial time from the stage at which the great Scandinavian ice-sheet split into two detached portions. Fortunately we know this date with some precision. The break-up of the ice-sheet set free a basin in Central Sweden which was immediately occupied by a lake, and this lake received year by year the drainage of a small mountain glacier, which deposited mud on the floor of the basin, but owing to the seasonal variation of temperature each year's deposit was divided into a light and a dark layer, giving a banded clay. The lake was accidentally drained in 1796, and G. de Geer, by counting the number of these annual bands, has been able to determine the approximate age of the lake. The uppermost layers had been destroyed, but it was possible to fill in the gap by utilizing similar deposits in other parts of northern Europe, and the whole duration of post-glacial time is now found to be 8,500 years. Thus we may commence our study of post-glacial climatic changes at the date 6500 B.C. A comparison of the variations of thickness of the annual layers from year to year in Sweden with the variations of similar deposits in North America and other parts of the world has enabled de Geer and his co-workers, prominent among whom is Dr. E. Antevs, to determine that the ice-sheets in Iceland, North America, the Argentine and the Himalayas were also in full retreat at the "official" end of

the Ice Age. Most geologists now believe that the great climatic alternations marked by the advances and retreats of the ice-sheets and glaciers, and by the formation and desiccation of great lakes in the Great Basin of western America, equatorial Africa and elsewhere, were approximately contemporaneous in all parts of the world.

Let us now consider the climatic conditions immediately after the close of the Ice Age. The material available for such a study is abundant—so abundant that I cannot give it in detail, but must limit myself to the more salient facts. We may begin with the prevailing winds, and fortunately we have a permanent record of these in the “fossil dunes” of northern Europe. The retreating ice left extensive sheets of sand and gravel, not yet covered by protecting vegetation, and this glacial debris was heaped up by the winds into great chains of dunes. The shape of these dunes was determined by the prevailing winds at the time, and later, when they became overgrown, this shape was fixed for us as a permanent record. A detailed study of the subject has been carried out by I. Högbom,* who reconstructed the isobars and winds shown in Fig. 1. This represents the conditions in summer at the end of the Ice Age; the arrows show the prevailing winds determined from the dunes, and the curved lines represent hypothetical isobars inserted to fit these winds. The map shows two main features: an area of high pressure over western Europe which, in conjunction with a depression over northern Russia, gives a vigorous westerly current of air across northern Germany, and another anticyclone over Scandinavia which gives north-westerly winds blowing towards the Gulf of Bothnia. The west European high-pressure area is similar to that which develops every summer at present, but the Scandinavian anticyclone is a novel feature, and must be attributed to the cooling effect of the remnant of the Scandinavian ice-sheet; it is, in fact, a “glacial anticyclone.”

In Sweden the winds appear to have blown almost directly downwards from the ice remnants to the Gulf of Bothnia. These descending winds were dry; the winters were cold, but the clear skies and abundant sunshine of summer made the latter season seem warm. Rainfall was especially scanty, and the

* “Ancient Inland Dunes of Northern and Middle Europe.” Stockholm, *Geogr. Annaler*, 5, 1923, p. 113.

climate of eastern Sweden was as a whole definitely of the continental or Russian type. Northern Germany and Denmark also had a dry climate; the fir grew in Denmark and the Baltic region, while central Europe was occupied by dense forests of

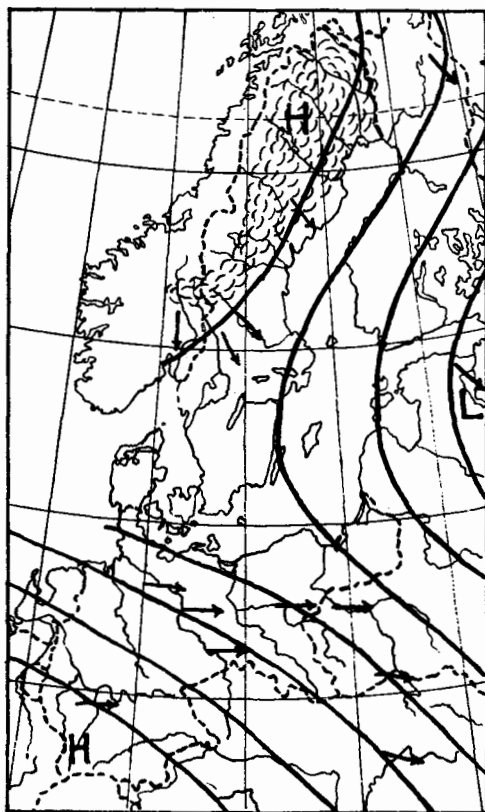


FIG. 1.—Probable run of isobars and dominant winds in finiglacial summer.

oak. It is probable that, though the winds were mainly westerly, as at present, the ridge of high pressure over Scandinavia was a bar to depressions moving eastward from the Atlantic, and the weather over northern Germany was more stable than at present.

The climate of this period, with its cold winters and warm,

dry summers, is reflected in the name which is assigned to it, the "Boreal" period. It was essentially a conflict between the increasing warmth and dryness due to the climatic amelioration on the one hand and the chilling effect of the remnants of the old glaciers and ice-sheets on the other hand. For this reason, although we know less about conditions in other parts of the world than north-west Europe, we can safely postulate a stage of similar climatic conditions wherever great ice-sheets had existed and were dissipating.

2.—THE "CLIMATIC OPTIMUM."

The early part of the post-glacial period we have seen as a time of rapidly rising temperature. This rise continued, and about 5000 B.C. we enter a long period of very favourable climatic conditions, which is known as the "Climatic Optimum." This is best known from researches in Scandinavia and northern Germany, but there is little doubt that it extended over the whole world, for reasons which will appear. Dealing first with Scandinavia, we find that the early part of the climatic optimum coincided with a deepening and widening of the Gulf of Bothnia. The submergence of part of Denmark and southern Sweden allowed free ingress to the waters of the Atlantic, and the Baltic was much warmer and more saline than at present. This change was reflected in the climate, which became more oceanic, the conditions of the Atlantic coast being transferred to western Finland.

The warmth of the climatic optimum was not a local phenomenon, however, but appears to have been world-wide in extent. All over the globe about this time we have evidence of warmer seas, from Franz Josef Land, Spitsbergen, and West Greenland in the north to Tierra del Fuego and the fringe of Antarctica in the south. Moreover, all these warm seas were deeper than the present sea, and except where the levels have been disturbed by local tectonic movements, as in Sweden, the raised beaches with a warm fauna are about 10 feet above the present beaches. Such a regular and widespread change of level shows that it was the sea which rose, not the land which sank. A general rise of level of this nature can only be due to one or both of two factors, a general rise in the temperature of

the world ocean through its whole depth, or the addition of water to it. To raise the level 10 feet would require an average rise of temperature by 10° F., or the removal of about 400 feet of ice from the whole surface of the ice-sheets of Greenland and Antarctica. Probably both factors co-operated, the melting of the ice having a larger share in the result than the warming of the sea, but both of them point to a very considerable warming up, especially in polar regions.

Now it is possible to calculate what the temperature of the Arctic Ocean near the North Pole would be, supposing that all the ice in the polar basin could be swept away. The calculation has been carried out in several ways, and all give approximately the same result, namely, that what is called the "non-glacial" temperature is only a few degrees below the freezing-point of sea water. It is the presence of the ice itself, with its great power of reflecting and radiating heat, which causes the great cold of the polar basin. A rise in the average annual "non-glacial" temperature of the polar region by 5° F. would mean that the floating ice would almost completely disappear. There are, in fact, reasons for believing that during the climatic optimum the mean annual temperature of Spitsbergen was above freezing-point, instead of 18° F. as at present. This tremendous change in the conditions of the Arctic must have had great repercussions on the weather of northern Europe, as we shall see later.

In north-west Europe the climatic optimum is divided into two periods: the first, known as the Atlantic, characterized by a moist, very oceanic type of climate, the second, or sub-Boreal, equally warm but much drier. There are indications that this separation into two periods extended over the greater part of Europe and into north-east Africa; how much further, information is at present lacking.

3.—THE ATLANTIC PERIOD.

This period was a time of great peat formation over the greater part of north-west Europe, and the forests of the Boreal period were killed by the accumulation of mosses. This was especially so on the western coasts of Ireland, England, and Scotland; on the eastern sides of these countries the replacement of forest by bog was much less complete. From this we can

infer that the rain-bearing winds came mainly from the west and south-west, and that numerous and intense depressions passed to the north-west and north of Ireland and Scotland towards Scandinavia. The warm Baltic offered a ready path for the passage of these depressions, and many of them turned south-eastward across the North Sea, and traversed Denmark

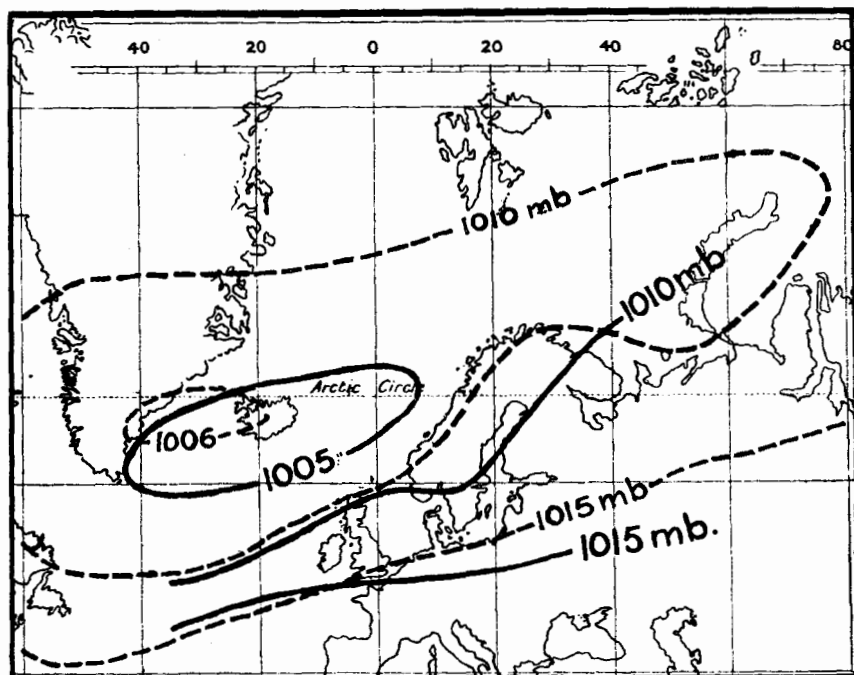


FIG. 2.—Probable Pressure Distribution in Atlantic period (full line) compared with present distribution (broken line).

and the German or Swedish coasts, bringing heavy rainfall. Gunnar Andersson has estimated the annual rainfall in southern Sweden at that time as 40 inches a year, the present average being only about 24 inches. The probable distribution of pressure inferred from these data is shown in Fig. 2, in which the broken lines show the present annual isobars, the full lines those inferred for the Atlantic period. The values assigned to the latter are arbitrary.

4.—THE SUB-BOREAL PERIOD.

The second half of the climatic optimum is termed the sub-Boreal period ; it was characterized by dry, warm weather over the greater part of the northern hemisphere. In most parts of north-west Europe the surface of the peat-bogs dried up and was covered by forest. In Germany heath plants took the place of bog plants, and in Russia steppe conditions developed. Lakes decreased in area and in some places dried up altogether, and trees grew in the dried-up basins below the level of the outlet ; the stumps of these trees can now be seen standing in the water. I know of four such cases, two in western Ireland, one in north-west Germany, and one in Austria. When these forests grew, the rainfall must have been less than the evaporation, and some calculations which I have made on this basis show that the rainfall of the sub-Boreal period was only about half the present rainfall.

In the west of Ireland, Scotland, and Norway, tree stumps are found even on the most exposed situations on the coast, and at heights of 2,000 feet or more on the western slopes of the hills. Small exposed rocky islets off the coast of Norway, now completely bare, were forested to the water's edge. On the other hand, the eastern slopes of the Pennines did not dry up to anything like the same extent, and there is no trace of the sub-Boreal forest layer there. These and other facts show that the prevailing winds in north-west Europe during this stage were not westerly or south-westerly, as at present, but easterly.

In the later part of the sub-Boreal period, after about 2400 B.C., there was a great spread of sea travelling, not only along the Mediterranean, but also along the Atlantic coast of Europe and even across the North Sea between Denmark and the British Isles. Considering the primitiveness of the ships, this suggests that quiet anticyclonic conditions were the rule. In France the evidence of dry conditions is much less marked than further north, so that depressions from the Atlantic, instead of traversing the area between Iceland, Britain and Norway, tended to pass further south and enter the Mediterranean across France. All these features suggest high pressures over the Iceland-Scandinavia region, descending to a minimum over France or the western Mediterranean. The dry belt appears to have extended across

Switzerland and Austria to southern Russia and south-west Asia, while in Egypt desert conditions set in definitely. A possible distribution of pressure is shown by the full lines in Fig. 3, in

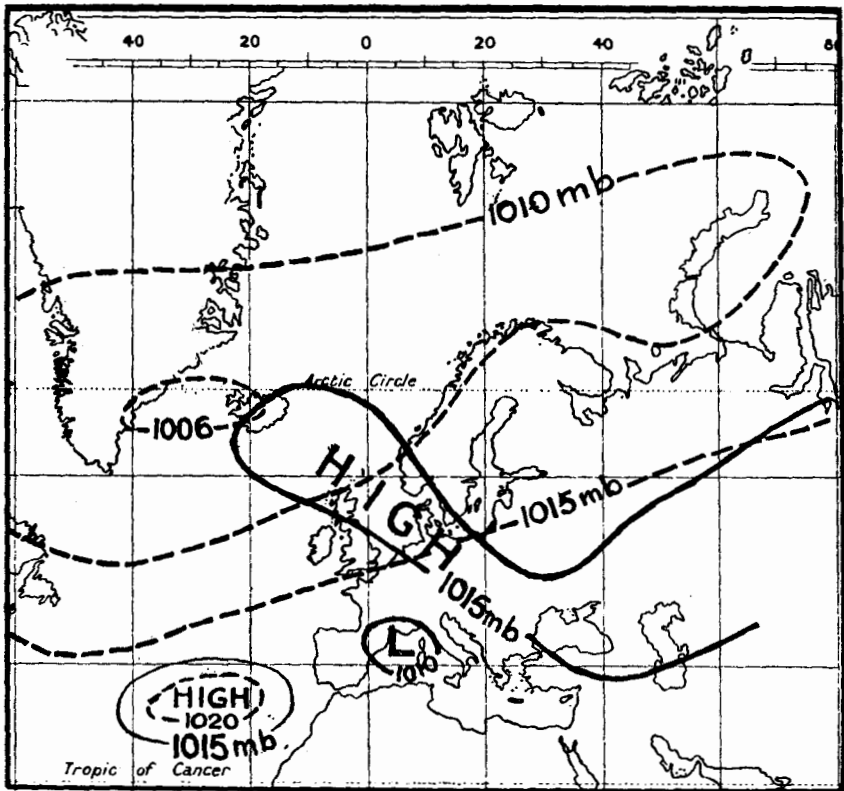


FIG. 3.—Probable Pressure Distribution in sub-Boreal Period.

which, however, the northern area of high pressure should probably have been extended to include the whole of Scandinavia.

There is some evidence that dry conditions existed also in the Great Basin of western U.S.A., where even the existing small remnants of the lakes dried up completely. This suggests similar conditions to those in north-west Europe, namely, a great decrease in the intensity of the storminess and a replacement of the prevailing westerlies by easterly winds.

5.—THE SUB-ATLANTIC PERIOD.

The sub-Boreal period continued until about 850 B.C., when a remarkable change set in. In north-west Europe the forests were killed by a rapid growth of peat, covering areas which had remained bare during the Atlantic period. As many of the bogs formed at this time are now drying up, for example in eastern Ireland, the rainfall was probably heavier than at present in the British Isles and neighbouring parts of Europe. Again, the great development of peat in eastern Ireland and north-east England, regions now comparatively dry, and the evidence of stormy conditions in the North Sea, suggest that in place of the prevailing south-westerly winds of to-day there were stormy winds from all directions, and that the main track of the storms, instead of passing north of Ireland and Scotland, lay directly across these Islands. This is supported by the evidence from other parts of Europe. In Scandinavia the climate was much colder and rainier than in the sub-Boreal period, and somewhat more rainy than at present, but the most striking evidence for the deterioration of climate comes from central Europe. The level of Lake Constance rose by more than 30 feet, most of the lake villages were destroyed, there is little trace of agriculture, and traffic across the passes, which had reached a high development during the sub-Boreal, almost ceased. All this is consistent with a main track of depressions across central Europe. There is also some evidence of wetter conditions in south-west Asia and north-east Africa, and though this is not entirely satisfactory, we may tentatively assume that the trough of low pressure from the British Isles across central Europe continued south-eastward to the eastern Mediterranean, where it joined a subsidiary centre of storminess in the Levant (Fig. 4).

In the western part of North America also the rainfall was greater than at present, as is shown by the renewed formation, though on a much smaller scale, of the glacial lakes of the Great Basin. Measurements of the salt content of these lakes, divided by the annual increment brought by the rivers, give an age of between 2,000 and 4,000 years. The Big Trees of California indicate a sudden increase in the rainfall about 850 B.C., and archæological evidence also points to a period of heavy rainfall about this time. Hence in North America, as in Europe, there

appears to have been a change from quiet, dry conditions to stormy westerly winds shortly after the beginning of the first millennium before Christ.

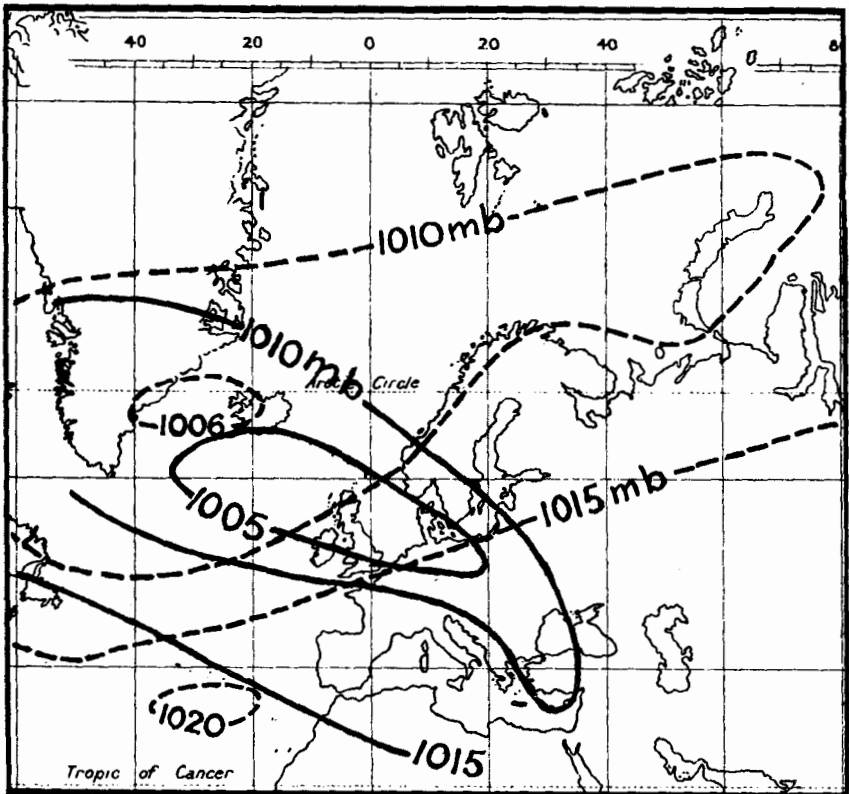


FIG. 4.—Probable Pressure Distribution in sub-Atlantic Period.

6.—THE RECENT PERIOD.

The sub-Atlantic Period may be considered to have come to an end at the beginning of the Christian Era, when conditions became rather similar to the present in all parts for which we have evidence. There have, of course, been climatic fluctuations since that date, but they have been on a smaller scale and of shorter duration than those hitherto described. It is necessary

to refer to them briefly, however, because of the light which they throw on the earlier more important changes.

The period between about A.D. 400 and 900 appears to have been dry in China and in central and south-western Asia, the dry area extending with decreasing intensity across central Europe, though it is doubtful if it reached England. The following passage from my paper before the British Association in 1930 sets out my ideas as to the pressure distribution* :—

“The droughts of the period from the fourth to eighth centuries seems to have reached their greatest intensity about the seventh, and to have been most severe in Asia in latitudes 30° to 45° . For other parts of the world the records are much less definite and convincing. This area is precisely that south of the great Siberian axis of high pressure which experiences easterly winds; in south-west Asia the rains are brought by occasional depressions in winter, while in China and central Asia they are monsoonal, brought by S.E. winds in summer. The phenomena therefore suggest an increase in the intensity and persistence of the great Siberian anticyclone, which would also tend to expand towards the west-south-west across Europe, bringing somewhat drier conditions to the Alpine valleys and at times perhaps influencing England. On the other hand, the Atlantic circulation would be strengthened, bringing more favourable conditions than at present to Norway and possibly also to Iceland and Greenland. Unfortunately, we have no information from these two latter countries for such an early date, but in the tenth century conditions seem to have been more favourable than at present.”

In the twelfth and thirteenth centuries we encounter a period of storminess and heavy rainfall in north-western Europe. Storms in the North Sea wrecked the coastal defences of Holland and formed the Zuyder Zee, inundating large areas of fertile ground and causing enormous loss of life and property. The Fen district also suffered severely from this continual battering, while in England the annals of the period make frequent references to the spoiling of the harvests by continual rain. The area with excessive rain does not seem to have extended to central Europe, however, and it appears that we have only to

* London, *Q.J.R. Meteor. Soc.*, 47, 1931, p. 22.

do with a trough of low pressure extending from the Icelandic low south-eastwards across the North Sea.

The third marked climatic anomaly of the Christian Era was much more recent, occurring during the period from about 1650 to 1750. Thanks to a series of actual observations of rainfall and wind we have more direct information of the climate during this period than during any of the preceding ones.* The rainfall was less than at present over the eastern half of Great Britain, France, southern Scandinavia and central Europe, the deficiency reaching 20 per cent. in southern France and Switzerland. In the British Isles north-easterly winds were more frequent than at present, while in Sweden and southern France northerly winds were especially frequent. In Italy and northern Africa rainfall was abnormally heavy. These facts point to a weakening in the intensity of the Icelandic low-pressure area and an increased storminess in the Mediterranean. Rainfall was also less than at present in western U.S.A., but heavy in Madeira, Abyssinia, which supplies the Nile flood, and China. I will point out the significance of these facts later.

7.—THE GENERAL CIRCULATION OF THE ATMOSPHERE.

So far I have been dealing with facts, or with fairly simple and direct inferences from known facts. The changes of climate set out above can now be regarded as well established. It is another matter when we consider the causes of these changes, and all I can do is to indicate a few possible lines of approach. Before doing so, however, it will be necessary to give a few words of explanation about the general circulation of the atmosphere as it exists at present, and the factors which modify it from time to time.

If we study a map showing the pressure distribution and winds over the northern hemisphere, we see four main features. Between Greenland and Norway, and especially south of Iceland, is an area of low pressure known as the Icelandic low, on the south-eastern side of which strong south-west winds blow over the British Isles and north-west Europe. A similar area of low

* London, *Q.J.R. Meteor. Soc.*, 56, 1930, p. 389.

pressure is found near the Aleutian Islands in the northern Pacific, and causes south-west winds on the west coast of North America. The low-pressure areas which we see on average maps are not permanent features of the pressure distribution, however; they are merely the result of superposing a large number of daily weather charts, on which we can see an almost constant succession of barometric depressions travelling from west to east. Some pass far to the north, some across the British Isles or along the Channel, but they are most numerous and most intense to the south of Iceland and off the coast of Norway. Similarly, the Aleutian low represents the most frequent position of a series of barometric depressions which strike the west coast of America in all latitudes from San Francisco to the Polar Sea.

The third feature of the map is a belt of high pressure which extends more or less unbroken round the world in sub-tropical latitudes, intensified into definite anticyclones in the Pacific and Atlantic Oceans. On the equatorial side of this high-pressure belt, and also on the eastern sides of the oceanic anticyclones, we have the north-east trade winds, which blow into the fourth feature of the chart, namely, the equatorial trough of low pressure. This system of south-westerly temperates and north-east trades, barometric depressions and anticyclones, is known as the atmospheric circulation.

Such a circulation requires energy to keep it going, and that energy is provided by the sun, which maintains a difference of temperature between low and high latitudes. The greater the difference of temperature, the greater the strength of the circulation. In particular, the barometric depressions, which there are reasons for regarding as the immediate motive power of the whole system, are formed mainly at the boundary of the cold polar air and the warmer air from sub-tropical latitudes—the famous “polar front.”

The low temperature of the Arctic is due in the first place to its high latitude, in consequence of which it receives little heat from the sun, but the cold is greatly exaggerated by the presence of the floating Arctic ice-sheet, which radiates and reflects heat to space very readily. Hence we may say that the existence of the oceanic circulation in its present form depends on the existence of the polar ice caps. Calculations show that even the minor changes of the Arctic ice-field from year to year have important effects on our weather. Thus we should expect

changes in the atmospheric circulation and in the distribution of climates to follow from changes of one or more of three factors :—

- 1.—The intensity of solar radiation received at the earth's surface.
- 2.—The distribution of solar radiation between equator and poles.
- 3.—The amount of ice in the Arctic Ocean, which may change in consequence either of a geographical change or of a change in the intensity or distribution of the solar radiation.

8.—DRY, WARM PERIODS IN NORTH-WEST EUROPE.

I have referred to a period of abnormal dryness in western Europe from 1650 to 1750, associated with a prevalence of northerly or north-easterly winds. This implies a weakened intensity of the Icelandic low, while all the other evidence which we have for that period points to a similar weakening of the general atmospheric circulation of which the Icelandic low forms part, or else to a strengthening of the monsoons which develop in opposition to the general circulation. Unfortunately, we have no information as to either the intensity of solar radiation or the ice conditions at the time, but all the evidence is consistent with the supposition that we have to deal with a period of increased solar radiation and little ice. The fact that, in spite of the frequency of northerly winds, temperatures seem to have been high even in winter, at least until 1740, is especially significant.

The dry, warm sub-Boreal period was similar to this recent dry spell in many respects, but was far more strongly developed and of far longer duration. Here we have very strong evidence in the high sea temperatures that the ice conditions were much less severe than at present. Whether these favourable ice conditions were due to increased solar radiation or to geographical changes is more doubtful, but I may venture a tentative suggestion. At the close of the Ice Age there was a thick and extensive sheet of ice in the Arctic Ocean. Then a period of intense solar radiation began, which caused mild but wet and stormy con-

ditions*—the Atlantic period—which continued so long as the Arctic ice cap withstood the increased heat. Finally, the ice broke up and a complete change of climate followed—the mild, dry sub-Boreal period. Then the solar radiation again decreased in intensity; for some time the open Arctic was able to maintain stable conditions in the north Atlantic, but when the sea froze over again—and once begun the process would be rapid, since ice breeds ice—the climate again became cold, wet and stormy—the sub-Atlantic period.

DISCUSSION.

The CHAIRMAN (Mr. R. G. K. Lempfert, C.B.E.), before calling for discussion, proposed a vote of thanks to Dr. Brooks for his deeply interesting paper. In some introductory remarks, he had already informed the meeting that the lecturer had won for himself a foremost place among British meteorologists, and that his work was known and appreciated the world over. He now proceeded to speak of the changes of climate that had occurred since the last great glaciation as forming a subject of absorbing interest. Many sciences besides meteorology—geology, archæology, history—had to be combined for its solution.

Changes of climate were gradual, and within the span of a single human life there could be no definite evidence of permanent change, but the permanent changes were none the less real. It did not require a very great change of climate to affect profoundly the economic and social relationships of human society. He asked his audience to try and think out for themselves the manifold ways in which life in this country would be affected if, for example, an exceptionally cold winter like that experienced two years ago—he reminded them of the bitter cold of February, 1929—became the normal type of winter in the South of England.

The vote of thanks was accorded with acclamation.

* *Vide* G. C. SIMPSON, "The Climate during the Pleistocene Period." *Edinburgh, Proc. R. Soc.*, 50, 1929-30, p. 262.

Lieut.-Col. HOPE BIDDULPH asked the lecturer if it was a fact that during the last fifty years the summers had become cooler and the winters milder.

Lieut.-Col. F. A. MOLONY inquired whether it was probable that a glacier came down to the level of Lake Van about 4500 B.C., which appears to be the most likely date for Noah's flood? Lake Van is 5,680 feet above sea-level, and 180 feet higher than the level to which the Aletsch glacier in Switzerland now descends. But this glacier is 8° of latitude, further north, than Lake Van. Lake Van is surrounded by high mountains.

The importance of the question lies in this, that as Lake Van covers 1,476 square miles, if its exit got temporarily blocked by a glacier or other means, the break up of that dam would send a tremendous flood down the Tigris, so that, far from Noah's flood being incredible (as a learned Dean recently implied) it becomes highly probable.

The learned lecturer has said that the climatic optimum began 5000 B.C. So 500 years later seems to be a likely date for the break up of such a glacial dam.

Mrs. MAUNDER said: There was a slight indication of the nature of the Sun's activity during part of the century 1650-1750. From 1645 to 1715 there was a dearth of sunspots, only a few spots being seen near the theoretical epochs of Sunspot maximum, and that in the Sun's southern hemisphere only. During this same period of sunspot dearth there were no auroræ seen in the British Isles between 1640 and 1691 (when there was a display in northern Scotland). After that there were feeble displays in 1706 and 1709, and in 1716 (February 24th) a display remarkable as occurring on the evening that the Earl of Derwentwater was beheaded, and thereafter giving the name of Derwentwater Lights in Cumberland to auroræ. On the following March 17th there was a great display, and this ended the dearth of auroræ. In Norway and Iceland there was little auroral display. Presumably magnetic storms also did not occur. Auroræ and magnetic storms are directly connected with solar activity as shown by the fact that they both give the solar rotation periods, and the great magnetic storms also show (in

some cases at least) a corresponding slight alteration in the solar constant.

During this same 70-year dearth of sunspots the tree-rings, as measured by Dr. A. E. Douglass in Arizona, showed "confusion," indicating that the rainfall there was affected. The difficulty is, of course, in seeing how this monotony of inactivity on the sun can have a positive effect on the earth's climate; and in getting some quantitative correlation.

Rev. C. W. COOPER expressed his great satisfaction in learning from Dr. Brooks that there was scientific evidence of some definite date in time for the introduction of the Post-Glacial period; and he asked if the lecturer thought that the withdrawal of the Ice Age was likely to be coincident with the advent of man. Mr. Cooper also expressed his appreciation in learning that the British Isles had always enjoyed climatic conditions favourable to the people who dwelt there. This seemed to him good evidence that in His Providence God had been preparing a place for our nation. Since he himself believed in the approach of a millennial age, the story of changing winds and climatic conditions showed how scientifically possible it was for God in His Providence to cause ideal climatic conditions for such an age in the future.

Mr. E. C. BARTON said: From the historical and biological aspects, this paper is so important as to justify a full afternoon's discussion. Hoping for such an event I shall merely ask Dr. Brooks whether he has considered the matter of speed variations in the spin of the earth through accumulations of water in such polar cap extensions as he has described. A 10,000-ft. layer of ice coming down to latitude 70° would increase the spin by a second per fortnight—through transport of rapidly moving tropical water to a glacier with only one-third the tangential speed. Such a speeding up would help to explain the North-to-South slope of raised beaches in Sweden or Ireland, without calling for tectonic movements.

Mr. HOSTE asked if there was any proof as to whether the *climatic optimum* was general throughout the world, or at any rate held good at about 5000 B.C. at the latitude of the Mediterranean, and Mesopotamia, usually regarded as the probable cradle of

the human race ? If so, this would coincide with the epoch which is viewed by many interpreters of the Holy Scriptures as the time of man's appearance on the earth. When Sir Arthur Keith speaks as he did in his inaugural address before the British Association three years ago, of man having been a million years on the earth, he makes it necessary to suppose that primitive man was an Esquimaux. But the question is could human life have weathered the Ice-Age ? or, indeed, any animal or vegetable life ?

Mr. AVARY H. FORBES : I have long wished to ask a skilled meteorologist a question about the weather, but have not had an opportunity till now. The causes of our weather are, I suppose, the sun—its size, distance, and heat ; the earth—its size, diurnal rotation, annual revolution, its polar obliquity, its elliptical orbit, and the character of its surface. Except to a negligible extent, these are all fixed and permanent. On each day of the year all these causes are exactly the same as they were on its previous anniversary. Why then is the weather not the same on its anniversary ? Why is it sometimes the very opposite ? Why, for instance, on June 21st, 1919, did we have cold weather and showers of hailstones ; and on another June 21st a hot and cloudless sky ? Even in tropical countries, like India, the weather will be normal or regular for many years together, and then the monsoons will fail, and a terrible famine will ensue.

I have heard it said that to-day's weather is the result of yesterday's ; this week's, of last week's ; and this month's, of last month's. If this be so, if our present weather conditions are the result of the previous weather conditions, it ought to be possible to foretell the weather weeks or months ahead. We have only to look up our charts and registers till we find a similar set of conditions (there must have been numerous similar ones) ; and thus, by observing what kind of weather followed those conditions, we should have the secret of the coming weather for weeks—months—years ahead.

In Scripture we find that regular *seasons* are promised : “ while the earth remaineth, seedtime and harvest and cold and heat, and summer and winter, and day and night shall not cease ” (Gen. viii, 22). This promise has been exactly fulfilled. But no such promise was given as to weather. On the contrary, rain, sunshine, and the weather generally is everywhere in Scripture promised—or

threatened—as reward or punishment. And it seems to me that that is the only rational explanation of the subject.

Lt.-Col. T. C. SKINNER, congratulating his fellow-members and associates on the distinction of having with them as chairman and lecturer two such eminent meteorologists, said: Meteorology is to many a closed book, and ignorance of the subject is too often reflected in ridicule. In reality it is one of the most difficult and, in a sense, most heroic of the sciences; difficult because of the instability of the elements with which we have to do; heroic in that, whereas astronomers can make our flesh creep with the picture of what is going to happen a hundred million years hence, and go unchallenged because life is too short to contradict them, for a meteorologist to predict the weather twenty-four hours in advance, he must take his reputation in both hands continually; and, to stand up to “the man in the street” every day of your life requires persistent courage. Even the hum-drum work of reading rain-gauges and other scientific instruments all days, in all weathers, and working out endless calculations therefrom, calls for sterling qualities; but when it involves being marooned in the Arctic for long periods, it requires heroism of a high order. At intervals the chief countries of the world agree to hold what they call a “polar year,” when meteorologists of the various contracting nations go out and bury themselves in igloos in the Arctic or Antarctic, and stop there a whole year taking observations for the benefit of mankind; and, as a matter of fact, one such “polar year” is now being arranged for 1932-33. As the lecturer pursued his theme, some of us may have reflected how wonderfully the changes, since retreat of the inhospitable ice-sheet, have worked together to adapt large areas of the earth’s surface for expansion and development of the human family; and to some will have come irresistibly to mind St. Paul’s words to the Athenians at Mars Hill—“He giveth to all life, and breath, and all things; and hath made of one, every nation of men, for to dwell on all the face of the earth; having determined their appointed seasons, and the bounds of their habitation, that they should seek God, if haply they might feel after Him, and find Him, though He is not far from each one of us, for in Him we live, and move, and have our being.” Of all sciences, it is my humble opinion that none brings home to us more directly or forcibly than the

study of meteorology the supreme fact that in God "we live, and move, and have our being."

WRITTEN COMMUNICATIONS.

Mr. GEORGE BREWER wrote : I notice that the third paragraph of p. 229 states that the sub-Boreal period which was characterized by great drought extended to between 2400 and 2300 B.C., that is, to the time of the Great Deluge. If this hypothesis be correct, it shows that for a considerable period before that catastrophe, large reserves of water had been formed by evaporation and land absorption, ready at the appointed time for the windows of heaven to be opened and the fountains of the great deep to be broken up. It also throws fresh light upon the faith of Noah, firm in his obedience to God's command, amid the scepticism of those around, in building a ship on dry land with no water anywhere near upon which to float it.

The great upheaval of geological strata which must have been occasioned by this sudden and universal deluge, will I believe account for much that is credited by some scientists to a series of protracted and more local disturbances during what is termed the glacial period : the discovery in widely separated parts of the earth of the remains of animals of various species, carnivorous and non-carnivorous heaped together, the bones ungnawed and in a state of good preservation, proving them to have been the victims of a sudden and universal catastrophe.

Mr. G. WILSON HEATH wrote : It would appear from the paper we have listened to, and the slides thrown on the screen, that the Ice cap periods occur in something like an order of cycles. May not these result from causes other than those mentioned in the paper ? For instance : (1) From gigantic gaseous activities in the sun ; or (2) from certain movements of the Planets in relation the one to the other ; or (3) from—and this suggests itself to me as most likely—the annual rotation of the earth on its axis, which tends toward the vertical by nearly a degree every year, and then after decades, proceeds at the same rate in the opposite direction. This movement is known to reduce, and then gradually increase the Arctic and Antarctic Ice-fields.

Climatic conditions have changed and do change, and more or less ice, and the corresponding more or less water, also varies in epochs. May not climatic variations be accounted for by planetary motions in relation to the sun; even as the tides are necessary for the health and well-being of man and beast? If this be so, the subject is removed from the region of man's speculations to that of the Divine plan and ordering.

In acknowledging a vote of thanks (proposed by Col. Molony), the CHAIRMAN said that while the laboratory physicist could control the circumstances of his experiment and arrange matters for the investigation of definite points,—not so the meteorologist. Control was out of the question. Patient and regular observation of events as they happened was the only method by which the material for the exercise of the deductive faculty could be accumulated. Other sciences were also dependent on observation rather than experiment. Control was out of the question in geology, for example, but the geologist had at any rate the advantage that he was observing a steady earth on which changes were slow. What he noted to-day, he could expect to find again to-morrow. In meteorology things were different: no meteorological situation ever repeated itself. No two days were ever alike in their weather, even at one and the same place, and when one surveyed a wide area, one had to wait a long time before finding even tolerable similarity, and the area which the meteorologist had to study was the surface of the whole globe. Therein lay one of the main difficulties of the subject, and the scientific meteorologist was deeply indebted to the army of patient observers who were busy in all parts of the world in collecting the facts on which the scientific superstructure had to be built up.

THE LECTURER'S REPLY.

Dr. C. E. P. BROOKS said, in reply, that in western Europe the winters had become milder and the summers slightly cooler during the present century. He did not think there was any evidence that an extensive glacier existed near Lake Van about 4500 B.C. He was very glad of Mrs. Maunder's remarks, but was unable to say to what extent a dearth of sunspots would affect our climate. The

evidence of human life dated back long before the end of the Ice Age, but it could be said that the period of *civilized* human life closely coincided with the post-glacial period. He thought that the raised beaches of Sweden and the British Isles, as also of North America, could be best explained by tectonic movements. He thought that all weather could be explained by a number of factors acting on various pre-existing situations, but the number of possible combinations was so great that it was highly improbable that two exactly similar situations would ever arise. The problem was too complex for mathematical analysis.

748TH ORDINARY GENERAL MEETING,

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL,
WESTMINSTER, S.W.1, ON MONDAY, JUNE 15TH, 1931,

AT 4.30 P.M.

DR. JAMES W. THIRTLE, M.R.A.S., IN THE CHAIR.

The Minutes of the last Meeting were read, confirmed, and signed, and the HON. SECRETARY announced the following elections:—As a Life Member, Miss A. M. Hodgkin, and as Members, Miss E. A. Everett, the Rev. H. L. Jennins, L.Th., the Rev. A. H. Finn, and the Rev. H. Temple Wills, M.A., B.Sc. As Life Associates, the Rev. Norman G. Dunning and the Rev. Joseph I. Brice, and as an Associate, George E. Dancer, Esq.

The CHAIRMAN then called on Sir Ambrose Fleming, D.Sc., F.R.S., the President, to give the Annual Address on "Light."

LIGHT.

(Hebrew, 'or; Greek, *phōs*; Latin, *lumen*; Italian, *luce*; French, *lumière*; German, *licht*.)

By SIR AMBROSE FLEMING, F.R.S. (*President*).

IT has generally been the custom, at least of late, to select for this Annual Address some special topic and not to make it merely a review of the year's progress or the state of this Institute. Accordingly I propose to offer you a brief account of modern views and ideas concerning the most ancient thing or agency in this Universe, namely, a ray of Light, in the hope that such information may prove of some slight interest to my audience.

I.—LIGHT THE REVEALER.

In that sublime account of the process of Creation given us in the first Chapter of the Book of Genesis the narrative opens with the general statement that in some far distant past there was a "beginning" to the heaven and the earth, that is to all things invisible and visible by creative Acts of Divine Power and Wisdom.

We are thus informed that there was a "beginning" and not an infinite past duration to the Universe, and that this beginning was not the result of any automatic process or spontaneous evolution or self-development, but an Act of Will by which the Thoughts in the Abysmal depths of the Divine Mind received in some way, quite incomprehensible by us, objective existence so as to become the subject of cognizance by other created Intelligences and Minds.

The chief agency which reveals to us objects not ourselves, which philosophic realism postulates exist apart from, or independently, of our own minds, is called Light; and hence the first distinctive fiat of creation is contained in the magnificent utterance, "And God said, Let there be Light and there was Light." These words, so to speak, draw up the curtain and place us in the position of spectators of the great successive Divine Acts in the drama of Creation which pass before us on the stage of the Universe. Light then is the revealer or agency by which we obtain in our own minds, ideas or perceptions of external things and of their right relation to each other.

The word *Light* as a noun or substantive occurs about 125 times or more in various parts of the Bible, and is sometimes used as a name for the physical agency which affects our bodily eyes by which we see material objects, and sometimes in a symbolical or spiritual sense as in such phrases: "The Lord is my Light and Salvation." (Ps. xxvii, 1.) "The entrance of thy Words giveth Light." (Ps. cxix, 130.)

In this latter use it is still claimed as a revealer, as opening to us or making known essential truths or facts in their right relation to each other.

In regions in which there is an entire absence of physical light we are unable to govern our own movements or actions with safety and certainty because we are unable to assure ourselves of the relation of surrounding material objects to each other.

and to ourselves. In an unfamiliar place or in a strange country we have to move or travel with extreme care in darkness lest we fall into some kind of danger, and only when the light comes or day dawns can we make sure of our steps and walk in safety.

The same thing holds good in the case of moral actions, or walk and of conduct generally. It is necessary for us to have some means of ascertaining right action or the true relations of things in the ethical and spiritual fields so as to avoid danger and guide our steps aright. As the Psalmist says: "O send out Thy Light and Thy truth; let them lead me; let them bring me unto Thy holy hill and to Thy tabernacles." (Ps. xliii, 3.)

Hence those agencies which give us this guidance, our conscience, or the inspired Scriptures, or the direct influence on us of the Divine Spirit are called also by the same name, Light; and we are enjoined to walk as "children of Light," and in this sense our Lord declares "I am the Light of the world: he that followeth me shall not walk in darkness but have the light of life." (St. John viii, 12.)

2.—THE NATURE OF WAVE MOTION.

One of the great subjects of scientific enquiry has for several centuries past been the exploration of the true nature of physical Light and how it renders objects visible to us. Certain agencies emit Light, such as the sun, various flames, or incandescent solids, lightning, electric sparks, and some living phosphorescent beings such as glow-worms, fireflies, or certain deep-sea fish. These we call illuminants. Others only scatter or reflect irregularly part of the light that falls upon them from illuminants, and it is this scattered light which entering our eyes renders the object visible to us. But that scattering is selective. Nothing except a surface we call perfectly white, such as newly fallen snow, reflects or scatters all the light which falls upon it.

Other surfaces absorb some of the incident light and scatter a portion, and it is this discriminating reflection which determines what we call the colour of the object.

The first fact regarding Light which assists us towards an interpretation of its nature is that it takes time to travel from one place to another. We know also that this is the case with

Sound. We hear the thunderclap after we see the lightning flash, and the sound of the explosion of a gun at a distance arrives later than the appearance of the smoke or flash from the gun, except when we are very close to the storm or the gun.

Experiment shows that in air at ordinary temperature Sound travels at the rate of about 1,100 feet per second or about 700 miles an hour; more than ten times the speed of an express train.

The speed of Light is, however, nearly 900,000 times greater than Sound and hence the fact that Light takes time to travel was not discovered until after astronomical observations began to be made with the telescope and the clock. Galileo made, it is true, a crude experiment with two lanterns, but it was only sufficient to show that the velocity of Light is enormously greater than that of Sound. Galileo discovered with his first telescope that the planet Jupiter has four moons revolving round it which are periodically eclipsed by passing into the shadow cast behind Jupiter. The period of revolution of each moon being then noted it was easy to predict the times of future eclipses.

A Danish Astronomer, Roemer, however, noticed that the eclipses of any one moon generally took place either earlier or later than the predicted time, and that the extreme range of this difference was about a quarter of an hour or about 1,000 seconds. It is clear that when the earth is on that side of its orbit which brings it nearest to Jupiter and when it is on the opposite side of its orbit the difference in its distance from Jupiter is nearly equal to twice the earth's distance from the sun, or 186 million miles, nearly. Roemer correctly surmised that the extreme difference between the predicted times of an eclipse of one of Jupiter's satellites at these two positions of the earth in its orbit, viz., 15 minutes or about 1,000 seconds is the time taken by light to travel 186 million miles. From which it is at once seen that the speed of light must be close to 186,000 miles per second.

Later on, methods of measuring the speed experimentally were devised by the French physicists, Fizeau and Foucault, and increasingly exact measurements have been made by others, one of the latest being by Michelson in America. The best results are very close to 299,800 kilometres or 186,295 miles per second.

When an effect takes time to travel it can only be one of

two things : it may be some article which is transmitted bodily, like a letter by post or a bullet from a gun ; or else it may be a particular state in some medium which is handed on from point to point in it. This is called wave transmission. Thus in the case of Sound the air is the medium. If an explosion is made at one point the air there is driven outwards and the particle compressed or squeezed closer together over a certain limited zone or region. Then this compressed air expands and squeezes together a layer of air laying beyond it and so on. Hence a region of compression is handed on from layer to layer, but the actual motion of any particular particle of air is very small. It is a *state* and not a *thing* which progresses.

A similar process takes place in the case of surface waves on water, only here it is not a state of compression in a mass but an elevation of the surface or hump on a surface that progresses. We can measure the velocity with which this state of the medium is propagated through it and this is called the wave or *phase velocity*.

There are two other terms we shall often have to employ. The term *wave-length* means the shortest distance from one wave crest or hump or condensation to the next. It is not the distance measured along the hump, but across from hump to hump if we are considering surface waves on water.

Then at any one point there is an oscillation of the particles of the medium, and by the term *frequency* we mean the number of complete cycles of oscillation or vibrations per second that take place.

There is also a simple connection between these three quantities in all cases of wave motion, and it is expressed by the statement : *The wave velocity is numerically equal to the product of the wave-length and the wave-frequency.*

Thus, for instance, in music, the note called the Middle C on the piano is created by 256 vibrations per second of the string. But we know from experiment that the velocity of sound in air at ordinary temperatures is close to 1,100 feet per second. Hence dividing 1,100 by 256 we have the quotient 4.3 feet, in other words the wave-length or distance from one condensation to the next in the air for this note is 4 feet 4 inches, nearly.

The frequency of the notes used in music varies from about 30 to 4,000 per second, and the wave-length therefore from about 40 feet for the deepest bass notes to about 3 inches for the highest treble notes in the scale.

There is one peculiar effect which enables us to decide whether we are dealing with a wave motion or with some transmission of matter. This depends upon what is called wave interference. It is possible to create two sets of waves in the same medium, and to so locate the place where the waves originate that at some other point the second set of waves generated cancels out or destroys the first set of waves, because the humps or crests or condensations of one set arrive at that point at the same time as the hollows or rarefactions of the second set. Accordingly the existence of this phenomena of interference has always been held to be a proof that we are dealing with a wave motion and not the translation of a substance.

3.—HYPOTHESIS AS TO THE NATURE OF LIGHT.

The human mind desires above all things not merely the collection of facts or records of phenomena in Nature, but what we call explanations of them, by which we mean an analysis which results in showing them to be the necessary consequence of more fundamental or simple elements or actions.

When Sir Isaac Newton admitted a slender beam of sunlight into his darkened room through a hole in a shutter and interposing a wedge-shaped piece of clear glass in its path, he found projected on a white screen the rainbow coloured band we call a solar spectrum.

Wollaston and Fraunhofer subsequently found that if the hole was a very narrow slit the spectrum was crossed by a number of black lines which indicate missing rays.

It was, and even is still, sometimes supposed that these different coloured rays exist mixed up in white light, but that is not entirely the true interpretation. The prism has some share in creating the spectrum out of the very complex and irregular vibration which constitutes the so-called white light.

In seeking for an explanation of the nature of Light Newton was well aware of the only alternatives possible, but the fact that in his mind operated against the assumption that in Light we are concerned with some kind of wave motion was the fact that sharp shadows can be formed.

We know that the air waves which constitute Sound bend round obstacles, so that we can, for instance, hear a band of music playing even when a row of houses stands between us and

the band. In the same manner we can hear a person speaking when the speaker is hidden behind a door or by some large piece of furniture. Hence Newton thought that if Light was a wave motion shadows would not be formed, but that the waves of Light like waves of Sound would bend round opaque objects. As a matter of fact they do so bend, but that bending is extremely slight on account of the very short wave-length of visible lights. Therefore Newton felt compelled to commit himself to the hypothesis that Light consists in certain exquisitely small particles he called *corpuscles* which are shot out in all directions from luminous bodies like bullets from a battery of machine guns.

This theory explained quite easily the reflection of Light because the corpuscles striking the surface of a mirror were sent off again at an equal angle just as a billiard ball is reflected when it strikes the cushion of the table. So far all was simple for the corpuscular theory. But now there is another optical effect called refraction not so easily explained. If you dip an oar or stick partly into clear water they appear to be bent at the water surface. Or, otherwise, suppose you put a coin into a deep empty basin and then move backward until the edge of the basin just conceals the coin from your eye. If, then, without moving your head, another person fills the basin with water the coin will again become visible to you.

We have then to explain the bending of rays of light when they pass from one medium (air) to another denser medium (water). Newton had to assume that in this case his luminous corpuscles were attracted or drawn towards the denser medium, and this implies as consequence that the corpuscles must move faster in water than in air. This as we shall see presently is contrary to fact.

The corpuscular theory explained then easily the formation of shadows and the law of reflection, and with a few additional and arbitrary assumptions some other optical phenomena.

On the other hand the wave theory of Light began to be developed first by Huyghens, a contemporary of Newton, and he gave a satisfactory explanation of reflection and refraction on this theory, and the latter effect was shown to be due to the reduced velocity of the waves in the denser medium.

A simple illustration will make this plain. Suppose a line of soldiers to be marching over a smooth common and then to come upon a piece of very rough ground separated from the smooth part by a straight margin inclined to the line of march.

As each soldier in turn steps on to the rough ground his marching speed is retarded, and a little thought will make it clear that when all the soldiers have stepped over the margin the line will still be "dressed," as a soldier would say, but the direction of march will have been slewed round towards the normal to the dividing lines.

About 1849 and 1850 two French physicists, MM. Fizeau and Foucault, devised methods of experimentally measuring the velocity of Light in the laboratory, and one of the results was to show that Light travels more slowly in water than in air. This result was held to be a crucial experiment entirely in favour of the undulatory theory of Light.

4.—THE POSTULATE OF THE ETHER.

The question, however, at once arose, if Light is an undulation, what is it that undulates? It must be an elastic medium or one in which a strain or displacement is resisted by a force of some nature, which strain tends to disappear when the stress, or force is removed. Now it can be shown that the velocity of a wave in any medium depends on the ratio of its elasticity to its density. It may perhaps be well to point out that the meaning of the word elastic is somewhat different in science and in common life. In the latter case we call anything elastic which is like an indiarubber band and can be much stretched by a slight force, provided it springs back when released. In scientific language we call a thing very elastic when it requires a large force to strain it sensibly, but springs back when released, like steel.

Since the velocity of light is very large, the undulatory medium must be very elastic or else have an extremely small density. Moreover, since Light travels to us from the sun and stars across empty, or nearly empty, space, it cannot be ordinary matter with vibrates, but must be some very special intangible material not having weight that is not subject to gravitation. Moreover, it can be shown that the vibrations which constitute light are different in one particular from those in air which create sound or music. In the latter case the air particles vibrate to and fro in the direction in which the sound is travelling, but in the case of Light the oscillations must take place across, or perpendicular to, the direction of propagation. The full reason for this is rather too long to give here. They are therefore called transverse

vibrations. This kind of distortional vibration can only take place in a solid substance, but a solid can also transmit longitudinal vibrations, as for instance those of sound. Noises and speech are heard through a wall or floor.

In the case of earthquakes the solid strata of the earth transmit the two kinds of vibrations. The longitudinal vibrations create what are called waves of compression and the transverse waves of distortion. These travel with different speeds in the crust of the earth, and when detected by instruments called seismographs enable an estimate to be made of the probable place of origin of the earthquake.

Now the fact that the vibrations of Light must be transverse necessitated the assumption of some very remarkable properties in this light-conveying medium or ether. It must have the properties of an elastic solid and yet apparently offer no resistance to the earth and other planets when moving through it at speeds of 70,000 to 100,000 miles an hour. Also it had to be entirely intangible and not detectable by any of our senses or scientific instruments. This medium then was called the ether, and must be, according to these necessary assumptions, something quite different from ordinary matter.

Nevertheless these postulates, extraordinary though they were, enabled mathematicians in the early and middle part of last century to give most excellent explanations of many optical phenomena, and the great physicists of that period, such as Thomas Young, Fresnel, Arago, Airy, Brewster, MacCullagh, Hamilton, Kelvin, and Stokes explained nearly all known optical facts by the aid of this hypothesis of an elastic solid ether and Light being its undulations.

But now, as Thomas H. Huxley once said, the great and ever-recurring tragedy of science is that of a beautiful hypothesis killed by an ugly fact. So common indeed, is this painful occurrence, that the past history of science might almost be described as a cemetery filled with the graves of dead and buried scientific theories.

Amongst them for nearly half a century this undulatory theory of Light based on the hypothesis of an elastic solid ether reigned as a queen. She had a large circle of admirers who praised the elegant and satisfying manner in which she explained all optical phenomena.

But then as in other cases some stubborn facts sprang up in unexpected places and besmirched her reputation, and she is now

forsaken and forlorn and her name is no longer mentioned in that scientific society where she formerly received so much attention.

5.—VARIETIES OF RADIATION.

Before discussing the modifications which have had to be made in the theory in Light to make it fit the facts of experience, it may be well to explain a few things with regard to radiation generally.

We know that in the case of air our ears can perceive a certain range of vibration as sound. In music we call one note the octave of another if the second has twice or else half the frequency of the first. The musical gamut or range is comprised within about 8 or 9 octaves, and a piano has a keyboard generally of 7 or 8 octaves.

Imagine then a kind of gigantic piano with a keyboard having a range of 60 to 80 octaves. Suppose our ears could hear as music only notes from one single octave about the middle of the keyboard and were deaf to all above or below it. This would give us some analogy with the case of Light. Our eyes are sensitive to, and appreciate as, Light vibrations in the ether lying between about 400 billion and 700 billion per second, that is to a single octave of ether vibration. These tremendous numbers convey no real idea to the mind, and yet it is quite certain they are not incorrect.

If you counted the numerals 1, 2, 3, 4, etc., at the rate of 60 per minute without stopping day and night it would take you $11\frac{1}{2}$ days each of 24 hours to count a million. It would take you $12\frac{1}{2}$ years, counting without stopping, to count 400 million and you would have to live about 12 million years to count up to 400 billion. Yet this stupendous number of ether or light waves enter your eye in one second when you look at any red object and about double that number when you look at a violet object. But beyond these limits, greater and less, there lie 30 octaves or more of radiation which cannot affect the eye yet travel at the same rate as visible light and have very similar properties.

Beyond the violet there lie the ultra-violet rays now used in medicine, and the X-rays or Röntgen rays used in Surgery. Also the Gamma rays given out by Radium, and the extremely

short Cosmic rays which come to us from the confines of the Universe.

Beyond the red end of the spectrum there are the Dark Heat rays, the Hertzian rays and that great range of vibrations used in wireless Telegraphy up to waves of 10 miles or so in wavelength. Whatever hypothesis or theory we may form as to the nature of visible light, the same kind of explanation must be valid for all that range of radiation just mentioned, because all of it is of identical nature and has properties of a very similar kind.

6.—ELECTROMAGNETIC RADIATION.

Almost exactly one hundred years ago (within 2 days) there was born on June 13th, 1831, at Edinburgh, a boy destined to become one of the small but noteworthy band of scientific pioneers, who in an all too brief life left his indelible mark on the history of scientific investigation. That boy was James Clerk Maxwell, and the field in which he did his greatest work was as a follower and exponent of Faraday in the region of electromagnetic phenomena.

On December 8th, 1864, Maxwell read to the Royal Society of London a paper entitled, "A dynamical Theory of the Electromagnetic Field," in which he embodied the result of years of profound thought, and put on record the reasoning which led him to the conclusion that Light was an electromagnetic vibration.

After Maxwell's early and lamented death an eminent Cambridge mathematician said to me that he considered this paper, by its profound originality, was one of the very greatest productions of the human mind. In this paper Maxwell showed that if a conductor, say for example a metal ball, is electrified it produces throughout all space a state called electric displacement or otherwise electric force. We cannot form any mental image of this effect in terms of mere mechanical motions or displacements. It must be accepted as an ultimate irresolvable idea. If that electric charge is suddenly created or destroyed at any one place the resulting electric displacement throughout space does not make its appearance or vanish everywhere at once, but the state is propagated throughout space with a speed which Maxwell proved as identical with the known velocity of

Light. Hence he inferred that Light is a periodic electric displacement, periodic in space and time, taking place at right angles to the direction of propagation of the ray. It is therefore said to be a wave of electric force or displacement.

This electromagnetic theory of Light dominated the field of physical explanations for thirty-five years, and then it also began to fail under the attacks of newly discovered facts. When a beam of white light is expanded by a prism into a rainbow-coloured strip or spectrum, we can measure in a certain way the energy of each of the coloured rays and we find that energy is small at both ends of the spectrum, viz., for the extreme red and extreme violet, and greatest for some intermediate point. No yet formulated wave theory of light could explain this fact. They all predicted that the greatest energy would be found accumulated in the shortest waves. Again, it had been found that some metals, such as potassium, sodium, caesium, and others gave off particles of negative electricity or electrons when exposed to violet or ultra-violet light and calculation showed that on the assumption of a wave theory in which the energy in a wave front was uniformly distributed over wave front it could not provide energy enough in an area of surface equal to an atom to make it discharge an electron from the atom.

Some of these difficulties were removed by a very important theory due to Professor Max Planck, of Berlin University, enunciated in December, 1900, which amounted to the novel suggestion that energy in the form of radiation like matter and electricity, is built up of atoms, and that only a whole number of these atoms can therefore be absorbed or emitted at once by an atom of matter.

The energy of radiation in this respect something like such articles as cigars or cigarettes we can only buy and sell them in whole numbers. We can have 1, 10, or 1,000 or more, but we cannot buy a fraction of a cigar or a part of a cigarette. These atoms of energy are, however, not all of the same size. The energy atom associated with violet light is larger or more powerful than that associated with red light. This is the reason that violet light or ultra-violet light can produce such vigorous effects. It spoils or fogs our photographic plates, it liberates electrons from photo-electric metals, it has therapeutic or medical properties when it falls on the human skin, and it ionizes or breaks up atoms of gases when it passes through them. It is therefore possible to give a scientific proof that a beam of light

cannot be simply a set of waves with the energy distributed uniformly over what is called the wave front. The energy must be located or concentrated in some places more than others so that the wave front has a speckled or irregular distribution of energy. In short the result of modern investigation has been to show that a beam of light resembles in some respects a shower of rain. A shower of rain consists of little drops of water of various sizes, and a beam of light is now regarded as being made up of little droplets of light energy, or as they are now called *photons* from the Greek word (*phōs*) for Light.

We know nothing about the absolute size of the photons, but we know that they each contain a store of energy which we might liken to a coiled-up clock or watch-spring, and this energy is proportional to the frequency of the Light ray which those particular photons create. That is to say each photon energy is larger in the case of violet light than for red light, and vastly larger for the photons which compose the X-rays than for those which compose the radiation made use of in wireless telegraphy and broadcasting.

It will be seen then that this latest theory of Light is a return to a sort of corpuscular theory as imagined by Newton, but with great differences. When a luminous source emits light, that is sends out photons, the photons of large energy are much more sparse or scarce than those of small energy. Hence when we analyse with the prism the white light sent out from a source we find that total energy in the form of red light is small, because the photons of that kind though numerous have each small energy. Also the total energy sent out in the form of violet light is small, because the photons of that kind are very scarce though each contains much energy. The photons of yellow or green light holding an intermediate amount of energy are intermediate in total number taken together convey a maximum amount of energy. Hence in this way the distribution of energy in the spectrum is explained. This photon theory also explains the photo-electric effect of emission of electrons from certain metals and other properties of short wave Light.

On the other hand it presents more difficulty in giving an explanation of the effects called interference, already mentioned. If a ray of light proceeding from a single point source is divided into two parts which travel along by two routes slightly unequal in length and are re-united at the terminal point, then if these two paths differ in length by a distance equal to an odd number

of half a wave-length for that light, then the two parts of the divided ray will neutralize each other at the terminus so that light added to light will produce darkness.

We cannot explain this kind of effect except by the assumption we are dealing with waves of some kind, and the only conclusion we can come to is that the photons are accompanied by waves or else that the photons are themselves groups of waves. Now this latter conclusion is one that modern physics favour. It is supported by the recent discovery that electrons or atoms of negative electricity which build up atoms of matter also behave sometimes as particles and sometimes as waves. Matter, Electricity, and Light, are each made up of atoms of some kind, and are all essentially of the same nature.

We now know, or have good reason for believing, that the radiation or Light from sun and stars is generated by the destruction or melting away of their Matter of Mass. Our sun, for instance, uses up 250 million tons a minute of its own mass to supply the heat and light it pours out. The merest fraction of all that radiation is caught up and utilized by our earth and the other planets, and most of the sun's radiation is cast out into empty space.

What becomes of all this energy? Is it wasted or is it in some way captured and again used to re-create Matter? These are questions Science cannot yet answer.

What we can say up to the present is that some optical phenomena necessitate the assumption that in Light we are concerned with a system of waves of some nature. But other effects indicate that Light involves some kind of particles or corpuscles. Hence neither Newton nor Huyghens were entirely right and neither entirely wrong. Our problem at the present moment is to search for a theory of Light which may explain how it can act both as a set of discreet particles and as continuous waves. The theory which has obtained a certain limited acceptance at the present time is that Light involves both waves and corpuscles or particles. The waves guide the particles or photons in such manner that the photons are most numerous where the amplitude or height of the waves is greatest, and absent in those places where the amplitude is zero.

The photons convey the chief part of the energy of the light, but the waves convey little energy. The waves consist of electric force which is periodic in space and time; that is large in some places and small or absent in others. The photons

always tend to accumulate in places where the force is large and avoid those where it is small. Also we must presuppose that photons like electrons repel each other and therefore tend to arrange themselves as much as possible spaced apart equally on the wave front. Nevertheless we have not yet completely found a key to the puzzle, and hence as regards the true nature of Light we are still very much in the dark.

7.—LIGHT, CELESTIAL AND TERRESTRIAL.

A question, however, which may be asked in conclusion is whether there are not more kinds of Light than one? We believe that distinct from this material world of three dimensional space and one dimensional time in which we now live and move there exists another distinct from, but perhaps interpenetrating, this one, which we speak of as "the other world."

There are many mentions in Scripture of Light which certainly did not proceed from the combustion, incandescence, or phosphorescence of ordinary matter, but which could under some conditions affect many human eyes at once, and, therefore, was not merely a subjective phenomenon. Neither can we regard them as events wholly fictitious and non-occurrent.

One of these was the "pillar of fire" over the tabernacle which guided and guarded the hosts of Israel during their wanderings in the wilderness. This was replaced by a cloud by day, and must therefore have been visible to hundreds of thousands of persons at once. (Exod. xl, 38.) Also at the giving of the Law on Sinai the mountain "burned with fire," (Deut. ix, 15), and was seen by all the hosts of Israel.

Another luminous phenomena which in the same way was visible to many was the shining light on the face of Moses when he came down from Mount Sinai after his Communion with God for forty days. So brilliant was it that he had to shield his face with a veil. (Exod. xxxiv, 29, 33, 34.)

Then again the angel of the Resurrection whose "face was like lightning" struck terror into the hearts of the Sentry Guard, in which there were perhaps four to six or more men.

There must have been something unearthly in this light so to alarm these hardened Roman soldiers.

In these luminous phenomena we do not include the appearance to Abraham of the "smoking furnace and burning lamp"

(Gen. xv, 17), nor that of the "bush burned with fire which was not consumed" that Moses saw (Exod. iii, 2).

Nor do we include the visions granted to Daniel and to John in Patmos, which were manifestations to single men and hence we can hardly say how far they were objectively real. It is, however, clear that there have been manifestations of Light which were supernatural. That some form of superlative light, of which science knows nothing, exists seems indicated in those grand concluding chapters of the Revelation to St. John, unless they are wholly symbolical, in which he sees in vision the City that "lieth foursquare" the heavenly Jerusalem whose "light was like a stone most precious," which had no need of the sun neither of the moon to shine in it . . . and the Lamb was the light thereof. The blessed inhabitants of that City need no candle neither light of the sun for the Lord God giveth them light." (Rev. xxi, 23; xxii, 5.)

Enquiry into these mysteries, however, lies far beyond our present powers; we can hope nevertheless to know something more about the nature of the Light by which our bodily eyes are stimulated.

Newton gathered a great harvest in that field of investigation, and his statue in the antechapel of Trinity College, Cambridge, shows him with the prism in his hand by which he first analysed white Light into a rainbow band.

You will perhaps remember Wordsworth's lines written when an undergraduate of St. John's College (which is only separated by a narrow lane from Trinity College Chapel) wherein he says:—

From my pillow looking forth by light of moon or
favouring stars I could behold
The antechapel, where the statue stands, of Newton
with his prism and his silent face,
The marble index of a mind for ever
Voyaging through strange seas of Thought; alone.

But although Newton's mind and those of all his great followers in physical investigation have voyaged for long years o'er strange seas of Thought in search of the secrets of the sunbeam, neither he nor they have been able to yet reveal to us more than the smallest fraction of all the mysteries which lie enshrined in a ray of Light.

On the call of the CHAIRMAN, a hearty vote of thanks was accorded to Sir Ambrose for his address.