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OF

THE VICTORIA INSTITUTE

—

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*** * The object of the Institute being to investigate, it must not be held to endorse the various views expressed either in the papers or in the discussions.**

VICTORIA INSTITUTE

REPORT OF THE COUNCIL FOR THE YEAR 1946.

READ AT THE

ANNUAL GENERAL MEETING, JUNE 2ND, 1947.

1. *Progress of the Institute.*

It is once more the duty of the Council to present to Fellows, Members and Associates the Annual Report, together with a Balance Sheet and Statement of Income and Expenditure. This is the eightieth report since the founding of the Victoria Institute and we have reason to be grateful that the work has been maintained throughout the war years.

The difficulties of the year in regard to paper, printing, and binding have been considerably greater than were experienced during the war as almost everyone is aware. The Council express their regret that, in consequence, the printers have been unable to produce the Transactions earlier.

The Council believe that the papers presented make a useful contribution to modern thought and that they maintain the high traditions of the Institute.

The sudden death of our President, Sir Charles Marston, on May 21st, 1946—only a few days before he was to have read his Presidential Address, deprived us of a steadfast and generous friend.

The gracious acceptance by our Vice-President, Sir Frederic Kenyon, G.B.E., K.C.B., D.Litt., LL.D., F.B.A., of the Presidency will be welcomed by Members. His eminence in scholarship is so well known that we are conscious of the honour which his consent to the Council's unanimous invitation confers upon the Institute.

2. *Meetings.*

The first three papers of the Session were circulated to subscribers and discussed by written communication. Five Ordinary Meetings were then held in addition to the Annual General Meeting and the Presidential Address.

(*Papers circulated.*)

"Precognition," by C. A. RICHARDSON, Esq., M.A.

"And the Earth was without Form and Void."—An enquiry into the exact meaning of Genesis 1, 2, by P. W. HEWARD, Esq., and F. F. BRUCE, Esq., M.A.

"Faith and Reason," by J. E. BEST, Esq., Ph.D., B.Sc.

(*Papers circulated and read.*)

"The Relation between Conduct and Belief," by The Rev. C. H. HENRY, M.A., Th.D. (being the Langhorne Orchard Prize Essay, 1945)

Rev. Chas. T. Cook, in the Chair.

"The Faith of Newton," by the Rev. ISAAC HARTILL, D.D., LL.D.

R. E. D. Clark, Esq., M.A., Ph.D., in the Chair.

"The Meaning of the Word 'Evolution' and its Bearing on the Christian Faith," by O. R. BARCLAY, Esq., M.A., Ph.D.

L. Richmond Wheeler, Esq., Ph.D., M.Sc., B.A., F.L.S., in the Chair.

"The Relation of Instinct and Emotion to Religious Experience," by E. WHITE, M.B., B.S.

E. W. Crabb, Esq., in the Chair.

"What do we mean by Inspiration?" by F. F. BRUCE, Esq., M.A.

Rev. Principal P. W. Evans, D.D., in the Chair.

Presidential Address, by Sir CHARLES MARSTON, F.S.A. "Human Nature. The World's Fundamental Problem."

Air Commodore P. J. Wiseman, C.B.E., in the Chair.

3. *Council and Officers.*

The following is a list of the Council and Officers for the year 1946 :—

President.

Sir Charles Marston, F.S.A. (died May 21st, 1946).

Sir Frederic G. Kenyon, G.B.E., K.C.B., D.Litt., LL.D., F.B.A.

Vice-President.

Prof. A. Rendle Short, M.B., B.S., B.Sc., F.R.C.S.

Trustees.

Wilson E. Leslie, Esq.

Air Commodore P. J. Wiseman, C.B.E.

Council.

(*In Order of Original Election.*)

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

Lieut.-Col. L. M. Davies, M.A., Ph.D., D.Sc., late R.A., F.G.S., F.R.S.E.

Wilson E. Leslie, Esq.

Percy O. Ruoff, Esq.

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

Air Commodore P. J. Wiseman, C.B.E. (Chairman of Council).

Rev. C. T. Cook.

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

O. R Barclay, Esq., M.A., Ph.D.

Honorary Officers.

Wilson E. Leslie, Esq., *Treasurer.*

R. E. D. Clark. M.A., Ph.D. (Papers Secretary)

Auditors.

Messrs. Luff, Smith & Co., *Incorporated Accountants.*

Assistant Secretary.

Mrs. L. L. M. E. Malcolm-Ellis.

4. *Election of Officers.*

In accordance with the Rules the following Members of the Council retire by rotation: P. O. Ruoff, Esq., and Robert E. D. Clark, Esq., M.A., Ph.D., who offer (and are nominated by the Council) for re-election.

The Auditors, Messrs. Luff, Smith & Co., Incorporated Accountants, offer, and are nominated by the Council, for re-election as Auditors for the ensuing year, at a fee of five guineas.

5. *Obituary.*

The Council regrets to announce the following deaths :—

Sir Charles Marston, F.S.A. (President). Sir Francis Outram, Bart., O.B.E., John H. Parker, Esq., Rev. C. Urquhart, B.A., Colonel A. H. Van Straubenzee, Rev. D. E. Hart-Davies, M.A., D.D., Miss K. Cheatham, W. J. Rowland, Esq., Rev. Barclay Buxton, M.A., Maj.-General H. N. Sargent, C.B., C.B.E., D.S.O., Rev. A. W. Payne, Henry Wilson, Esq.

6. *New Fellows, Members and Associates.*

The following are the names of new Fellows, Members and Associates elected in 1946 :—

FELLOWS: Edward H. N. Ryde, Esq., Rev. Charles Ferguson Ball, B.A., Th.D., Miss J. Van Straubenzee, W. J. Beasley, Esq., F.R.G.S., W. W. Balloch, Esq., L. W. Moscrop, Esq. (Life Fellow), D. S. Milne, Esq., M.B., ChB., Lt.-Colonel W. E. Shewell-Cooper, Ph.D., F.L.S., Robert W. Wyse, Esq., G.M., M.B., F.R.C.S., Rev. J. T. Zamrazil, B.Th., D.D., Edgar O. Wood, Esq., M.A., Ph.D., Lloyd S. Hawboldt, Esq., M.Sc., Cosmo Sheridan Grant, Esq., Percy L. Watts, Esq., Joseph Smith, Esq., Ph.D., M.Eng., B.Sc. (on transfer from Member), A. H. Boulton, Esq., John J. Carr, Esq., Philip S. Henman, Esq., Arthur J. Constance, Esq., Professor J. F. Doering, M.A., Th.M., Ph.D., D. Litt., James Hollingworth Esq., Rev. Chas. T. Cook (on transfer from Member), Mrs. B. Skinner (Hon. Life Fellow), Rev. Albert H. Hawley, B.D., LL.D., P. W. Petter, Esq.

MEMBERS: Miss G. Martin-Harvey, Lt. Commander James F. Welsh, M.B.E., R.N., Samuel S. Cooper, Esq., Miss Margaret Dix (on transfer from Associate), Stephen S. Short, Esq., M.B., Ch.B., M.R.C.S., L.R.C.P. (Life Member), D. R. Paterson Foot, Esq., Ernest J. Duffield, Esq., Rev. Basil H. Williams, B.A., Lt. James Clark, R.N.V.R., Cuthbert W. D. Warburton, Esq., M.A., Donald R. Mitchell, Esq., Clive B. Sage, Esq., John B. Messenger, Esq., Miss L. E. Kent, B.A., M.D., Ralph T. Lovelock, Esq., A.M.I.E.E., Ernest H. Trenchard, Esq., B.A., Miss M. G. Rice, B.A., L. R. Harris, Esq., B.A., William T. Stunt, Esq., D. Wallace, Esq., M.A., M.B., Ch.M., Alexander W. H. Dick, Esq. (Life Member), Edwin M. R. Smith, Esq., B.Sc., A.K.C., John H. Boshier, Esq., B.Sc., Rev. H. L. Ellison, B.D., B.A., E. L. Wilcox, Esq., Miss E. N. D. Butler, Victor C. Reed, Esq., M.A., L.C.P., Edwin T. Shepherd, Esq., Warren H. Mason, Esq., B.Sc.

ASSOCIATES: Rev. William H. Beales, M.A., Rev. R. S. Roxburgh, L.Th., Pastor Raymond E. Euston, Miss L. E. West, David B. Allbrook, Esq., Harding College Library, U.S.A. (Library Associate).

7. *Membership.*

Life Fellows	25
Annual Fellows	106
Life Members	29
Annual Members	266
Associates	76
Library Associates	43
	545

8. *Donations.*

J. B. Nicholson, Esq., £20 13*s.*; Chas J. Young, Esq., 12*s.*; W. E. Leslie, Esq., £2 2*s.*; Dr. Ernest White, £2 2*s.*; Douglas Dewar, Esq., £2 2*s.*; Dr. Brian Sutherland, £1 14*s.*; H. H. Goodwin, Esq., £1; Conway Ross, Esq., £1 1*s.*; Peter Hill, Esq., £1; J. C. Scott, Esq., 10*s.*; Arthur Constance, Esq., £2 2*s.*; Miscellaneous, 3*s.* Total, £35 1*s.*

9. *Finance.*

The Income and Expenditure Account reveals an expenditure of £39 13*s.* 9*d.* over income, but this amount is almost met by donations amounting to £35 1*s.* The sum of £188 16*s.* 9*d.* being the excess expended in past years, remains to be met. Provision has been made for liabilities in connection with arrears of printing. It will be realised that paper, printing and binding costs have risen considerably, while individual subscription fees remain static. It is hoped that the additional costs will be met by an increase in the number of Fellows and Members, or by donations.

P. J. WISEMAN,
Chairman.

BALANCE SHEET, 31st DECEMBER, 1946.

LIABILITIES.

	£ s. d.	£ s. d.
Subscriptions Paid in Advance		18 11 8
Sundry Creditors for Expenses		226 11 8
Life Subscriptions :—		
Balance at 1st January, 1946	521 0 0	
Additions	64 4 0	
	585 4 0	
Less Amount carried to Income and Expenditure Account	15 4 0	
		570 0 0
"Gunning" Fund (*per contra*)		508 0 0
Balance at 1st January, 1946	88 10 0	
Dividends and Interest received	23 14 6	
	112 4 6	
Less Prize and Expenses	48 8 0	
		63 16 6
"Langhorne Orchard" Fund (*per contra*)		200 0 0
Balance at 1st January, 1946	16 4 10	
Dividends and Interest receivable	9 1 10	
		25 6 8

ASSETS.

	£ s. d.	£ s. d.
Cash at Bank :—		
Current Account	465 18 8	
"Gunning" Prize Account	16 14 6	
"Langhorne Orchard" Account	7 4 2	
"Craig Memorial Trust" Account	19 15 0	
		509 12 4
Petty Cash and Stamps in Hand		3 5 4
Suspense Account re Income Tax Reclaim		51 10 9
Subscriptions in Arrears :—		
Estimated to produce		170 0 0
Investments (At Cost) :—		
"Gunning" Fund :—		
£673 3½ per cent. Conversion Stock	508 0 0	
"Langhorne Orchard" Fund :—		
£258 18*s.* 3½ per cent. Conversion Stock	200 0 0	
"Schofield Memorial" Fund :—		
£378 14*s.* 6*d.* 2½ per cent. Consolidated Stock	220 0 0	
"Craig Memorial Trust" Fund :—		
£376 7*s.* 4*d.* War Stock 3½ per cent.	400 0 0	
		1,328 0 0

"SCHOFIELD MEMORIAL" FUND (*per contra*)				220	0	0	INCOME AND EXPENDITURE ACCOUNT :—					
Balance at 1st January, 1946....	9	9	4				Balance at 1st January, 1946....	184	4	0		
Dividends receivable	9	9	4				*Add* Excess of Expenditure over Income for the year 1946	39	13	9		
				18	18	8		223	17	9		
"CRAIG MEMORIAL TRUST" (*per contra*)				400	0	0	*Deduct* :—					
							Donations received	35	1	0		
											188	16 9
				£2,251	5	2					£2,251	5 2

We report to the members of the Victoria Institute that we have audited the foregoing Balance Sheet dated 31st December, 1946, and have obtained all the information and explanations we have required. We have verified the Cash Balances and Investments. No valuation of Furniture, Library or Tracts in hand has been taken. In our opinion the Balance Sheet is properly drawn up so as to exhibit a true and correct view of the affairs of the Institute according to the best of our information and the explanations given to us and as shown by the books of the Institute.

(Signed) LUFF, SMITH & CO.,
Incorporated Accountants.

Drayton House,
Gordon Street,
London, W.C.1.
28th April, 1947.

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST DECEMBER, 1946.

EXPENDITURE.

	£	s.	d.	£	s.	d.
To Rent, Light, Cleaning and Hire of Lecture Room	72	16	7			
„ Salary (Assistant Secretary)	200	0	0			
„ National Insurance	4	12	10			
„ Printing and Stationery	277	11	8			
„ Postages, etc.	51	13	9			
„ Audit Fee	5	5	0			
„ Sundry Office Expenses	17	1	5			
				629	1	3
				£629	1	3

INCOME.

	£	s.	d.	£	s.	d.
By Subscriptions :—						
Fellows	225	4	6			
Members	268	2	3			
Associates and Libraries	39	18	1			
				533	4	10
„ Proportion of Life Subscriptions				15	4	0
„ Sale of Publications				27	15	4
„ Income transferred from "Craig Memorial Trust" Fund				13	3	4
				589	7	6
„ Balance being Excess of Expenditure over Income for the year 1946				39	13	9
				£629	1	3

THE ANNUAL GENERAL MEETING

OF THE

VICTORIA INSTITUTE

WAS HELD AT 12, QUEEN ANNE'S GATE, LONDON, S.W.1, ON JUNE 2ND, 1947.

SIR FREDERIC KENYON, G.B.E., K.C.B., D.Litt., F.B.A., LL.D., THE PRESIDENT OF THE INSTITUTE, IN THE CHAIR.

The Minutes of the Meeting held on May 27th, 1946, were read, confirmed and signed.

The Chairman then proposed, and it was agreed, that the Report of the Council and the Balance Sheet and Statement of Accounts which had been printed and circulated to Fellows and Members be taken as read.

The Rev. A. E. HUGHES proposed and Mr. LUFF-SMITH seconded the *First Resolution*:—

> "That the Report and Statements of Accounts for the year 1946 presented by the Council, be received and adopted; and that the thanks of the meeting be given to the Council and Officers for their efficient conduct of the business of the Institute."

The Resolution was put to the meeting and carried unanimously.

Air Commodore WISEMAN proposed and Mr. D. DEWAR seconded the *Second Resolution*:—

> "That P. O. Ruoff, Esq., and R. E. D. Clark, Esq., M.A., Ph.D., retiring members of the Council, be, and hereby are, re-elected."

The Resolution was put to the meeting and carried unanimously.

The Rev. C. T. COOK proposed and the Rev. A. E. HUGHES seconded the *Third Resolution*:—

> "That the Vice-President, Prof. A. Rendle Short, M.B., B.S., B.Sc., F.R.C.S., and the Honorary Treasurer, Wilson E. Leslie, Esq., be and hereby are, re-elected to their offices, and that Messrs. Luff-Smith & Co., Incorporated Accountants, Drayton House, Gordon Street, W.C.1, be also re-elected as auditors."

The Resolution was put to the meeting and carried unanimously.

It has sometimes been necessary in the interests of economy, etc., to summarise discussions on these papers. In many instances the spoken word or the written communication is of greater length than that given in the Transactions.

(Issued on the 6th January, 1947.)

USE AND MISUSE OF MATHEMATICS

By E. H. Betts, B.Sc.

THIS paper endeavours to answer two questions: What is mathematics? and, What is its logical status when applied to other sciences?

Historically, mathematics doubtless originated in practical transactions and land-surveying, requiring and leading to the use of number and counting and the measurement of distances and areas. Hence it has been traditionally defined as "the science of discrete and continuous quantity." But the almost incredible development of arithmetic and geometry with their widening generality and consequently increasing abstractness, their ever-extending use of symbols, their postulational, deductive—and hence "creative"—systems, has so transformed the subject that the old definition will no longer contain it. It is obvious, for example, that projective geometry, which deals with non-mensural facts and relations, would be excluded by the above definition, as would other vast tracts of modern mathematics. The closer scrutiny given in the nineteenth century to the logical foundations of the subject, including especially the definitions and axioms of Euclid's geometry, revealed the defective plausibility of the famous "parallel axiom," the reliance placed on spatial intuitions and the hitherto unsuspected use of many implicit assumptions. This brought into prominence the possibility of geometries other than Euclidean based on the denial of the parallel axiom. Such logically consistent deductive systems having been actually constructed, not only geometries but also algebras—quaternions, e.g.—it appeared that if account were taken of these and all other recent developments, the characteristic activity of mathematics must be held to be deduction. Accordingly, as long ago as 1870, mathematics was defined by the American mathematician Benjamin Peirce (*Linear Associative Algebra*) as "the science which draws necessary conclusions." This was one of the earliest recognitions that mathematics is not tied either to number (discrete magnitude) or to geometry (continuous magnitude) or indeed to any particular subject-matter, but that "it belongs to every inquiry, moral as well as

physical " (*loc. cit.*). The layman may well ask what then is the distinction between mathematics and logic ? The modern majority reply is that there is none. For the great effort of recent mathematical philosophers has been to reduce all the concepts and propositions of the former to those of the latter—and at the same time to insist on the severest rigour by dint of making every necessary assumption explicit. Whitehead, for instance, defines mathematics as " the science concerned with the logical deduction of consequences from the general premises of all reasoning."[1] Bertrand Russell's version, fully in accord with this, is that mathematics is " the class of all propositions of the form 'p implies q' where p and q are propositions and neither p nor q contains any constants except logical constants."[2] The actual exhibition of mathematics as a construction built up solely on the notions and principles of pure logic has been given us in *Principia Mathematica*, the classic work of Russell and Whitehead—which has, however, by no means been found to be above criticism, and that on logical grounds. It will doubtless be argued that this identification of mathematics with formal logic will exclude the use, in mathematical work, of experimental methods, of the analogy of the mechanical model, of the *feeling* for pure form, of the intuitive flash and of the (often fruitful) fumbling towards a result—methods and processes which have admittedly been productive during the long history of mathematics of many, if not most, of its greatest discoveries. The use by mathematicians of these methods in actual discovery is not denied. But however arrived at, and whatever be the machinery of discovery, no proposition takes its place in the system of mathematical knowledge proper until it has been " proved," that is to say, logically deduced from previously established propositions. An inquiry into the nature of mathematics would not therefore be satisfactory without examination of the nature of those propositions which are logically prior to all others, and also of the ultimate notions the relations between which are stated in these logically prior propositions. Full discussion of this is beyond the scope of this paper. Some important conclusions may however be given. (i) The idea of logical priority

[1] *Ency. Brit. XIV, Art. Maths. Nature of*, Vol. 15, p. 86.

[2] *Prins. of Maths.*, p. 3. A logical *constant* is a symbol which signifies logical form, e.g. *ent* (=" entails ") signifies the form of implication. " If . . . then . . ." *Ent* in any logical calculus is a constant. A *variable* is a symbol employed to give generality instead of any particular material constituent, e.g. x instead of *Caesar*, a instead of *generals*.

is relative and not absolute, i.e. it relates to priority within any given system and not to general priority. (ii) Any deductive system, and therefore mathematics, as such, must commence with certain *undemonstrated propositions* ("primitive propositions" as they were called by Peano) and certain *undefined elements* ("primitive concepts"). (iii) Since it must be an ultimate law or postulate of all thought that truth cannot contradict itself it is necessary for the primitive propositions to be mutually consistent. But (iv) They need not be demonstrably *true*, i.e. in accord with perceptual experience; for demonstration of truth in this sense belongs to physics or natural science. (v) It has also been shown by the work of Peano, Frege and Russell that for mathematics in general the primitive concepts are those of ordinary logic, e.g. a *class*, *belonging to a class*, and *similarity*, and not our intuitively acquired notions of space or of the natural numbers.[1] In short, mathematics, radically viewed, is the science of reasoning from given premises. Whatever its methods—use of symbols, e.g.—its processes are indistinguishable from those of ordinary inference. Even its symbols are available for use in ordinary reasoning where necessary. De Morgan showed, for instance, how difficult it often is to answer simple questions in the logic of relations without the use of symbols, and adduced as an example: "What people are not the descendants of those who are not my ancestors?"[2] It is not, therefore, an incorrect use of terms to speak, as is often done, of "mathematical certainty" in relation to the results of ordinary reasoning, that is, reasoning not directly concerned with scientific or mathematical enquiries. In this usage, "mathematical certainty" must simply mean correctness of inference, or absence of fallacy in the reasoning process. A detective, for instance, may speak of the mathematical certainty of his conclusions when on the ground of a few clues, by means of a chain of strictly rigorous inferences he has satisfied himself of the guilt of his suspect.

It should, perhaps, be noted before proceeding, that although the more modern view of mathematics as the science concerned with deduction seems to cut loose the close ties with number and magnitude which it has always had in the more popular view, yet the notions of number and quantity must always

[1] This (v) is not accepted without modification by all thinkers.
[2] Cited by Stebbing, *Mod. Introduction to Logic*, p. 180.

remain prominent—the most prominent—topics of mathematics, since it must be with these notions that mathematics in its applications will be chiefly concerned.

Of itself, then, mathematics has nothing whatever to say about the physical world. It is concerned only with deduction. It may be applied to physical data. These must be the result of observation and are part—indeed the basis—of physics and the other sciences. Applied mathematics is in one sense indistinguishable from pure mathematics. Both are concerned with the making of deductions from given propositions. And, as Whitehead says: "When once the fixed conditions which any hypothetical group of entities are to satisfy have been precisely formulated, the deduction of the further propositions which will hold respecting them, can proceed in complete independence of the question as to whether or no any such group of entities can be found in the world of phenomena. . . . The difference (between "pure" and "applied" mathematics) is a difference of method. In "pure mathematics" the hypotheses which a set of entities are to satisfy are given and a group of interesting deductions are sought. In "applied mathematics" the "deductions" are given in the shape of the experimental evidence of natural science and the hypotheses from which the "deductions" can be deduced are sought. Accordingly every treatise upon applied mathematics, properly so called, is directed to the criticism of the "laws" from which the reasoning starts, or to a suggestion of results which experiment may hope to find. Thus if it calculates the result of some experiment, it is not the experimentalist's well-attested results which are on their trial, but the basis of calculation."[1]

The mathematician as such thus works in a kind of aloofness from the world of physical facts. "Here's to Pure Mathematics, and may it never be of use to anyone!" The toast, attributed to a mathematical don, illustrates finely the seclusion in which the pure mathematician carries out his work and erects his edifice of theorems. The cult of knowledge for the sake of knowledge was never so truly exhibited as in the upbuild of mathematical theory, which can be properly appraised and appreciated only by mathematicians themselves. For to few even of educated people is it given to enjoy the extent, the inventiveness, the beauty of form and the

[1] *Ency. Brit. XIV Art. Maths. Nature of*, pp. 85 *seq.*

depth—the poetry, it may be not inappropriately styled—of mathematical knowledge and especially that shown in its growth during the last century and a half. In the attempt to form a correct idea of modern mathematical development, any retained knowledge of mere "school mathematics" is probably misleading. How many, for instance, have more than a vague notion of the content and meaning of the non-Euclidean geometries, the many beautiful theorems of the theory of numbers or the theory of abstract groups—to mention random samples? It is true that engineers make application of some of the more superficial layers of mathematics, and that physicists from rather deeper strata cull parts they can use. It is also true that mathematical methods and ideas have during the last quarter century progressively infiltrated all the sciences, even such sciences as physiology, sociology, biology and psychology. It remains true, however, that in the higher reaches of pure mathematics no one but the mathematician himself is competent to survey the scope of the subject or completely to assess its worth.

The knowledge of this state of things, combined with the universally acknowledged power and utility of mathematics in its many applications, tends on the part of the mathematicians to a self-complacency of which the signs and portents are not lacking. The belittlement of common-sense, the arrogation to mathematics of a place of dominance in the gamut of the sciences, the attempt to set forth physical science as a purely deductive system, the minimization of the importance and the function of experimental methods—these are some of the indications that there is need of plain speaking about the place and status of mathematics in science. For while public ignorance provides a fruitful soil for the propagation of extravagant and fantastic ideas about mathematics in its relation to other branches of knowledge, and while it may be true that only a mathematician can fully estimate its worth and beauty, it is, notwithstanding, quite unnecessary to be a mathematical expert in order to understand its limitations. All that is needed for such purpose is a knowledge of its logical foundations—its nature.

It may first of all be observed, in passing, that the mathematician, *qua* mathematician, is a specialist. This qualifies him, if he is proficient, to make pronouncements about mathematics, but about nothing else. It is a well established psychological doctrine that we cannot learn one thing by doing another. Not

only is it true, for instance, that we cannot make ourselves competent biologists by the study of physics, but it is just as certain that we cannot make ourselves exact thinkers in general by the study of mathematics in particular. Exemplifications of the truth of this principle are not far to seek. The characteristic feature of pure mathematics, and especially modern pure mathematics—say since the days of Cauchy (1789–1857) is its assiduous rejection in its constructive work, of all assumptions but its own explicitly recognized axioms and postulates. Mathematical certainty springs from this rigour and from nothing else (except of course the avoidance of formal fallacies). The successful pure mathematician is he who can think constructively while making no assumptions other than those stated as an integral part of the whole argument. And yet highly distinguished, even brilliant, mathematicians, in their general thinking, fail of these cautionary measures. Professor G. H. Hardy, for example, in his otherwise justly valued *Course of Pure Mathematics*[1] says, "It is stated in the Bible (1 Kings vii, 23, 2 Chron. iv, 2) that $\pi = 3$." This, it must be said, is a false statement about the Bible. But, more to the point, its falsity is a direct result of the infringement of the canons of mathematical thinking. For it rests on at least two implicit, untrue and indefensible assumptions. The first is that the Biblical writers cited were making statements about the relation between the circumference and the diameter of the circle; and the second is that the measurements they gave were given as those of a plane circle. Both these assumptions are false and reprehensible. An unbiased reading and consideration of the Bible passages shows that the question of the relation of circumference to diameter is neither directly raised nor indirectly involved in them; and that the dimensioned description is that of a vessel of circular cross-section indeed, but having a wall a hand-breadth thick and furnished with a double row of "knops" under its out-curving brim. These features made it inexpedient, if not impossible, to take the measurements of the diameter and the girth of the vessel at the same level. If the former were measured, as would be natural, by stretching a line across the mouth from brim to brim, and the latter by passing a line round the vessel at the most convenient place, *viz.* below the "knops," the ratio would as a matter of course be reduced from the known value of π to something

[1] 9th Edn. 1944, p. 70.

approximating to 3. And to make the girth exactly three times the diameter may well have been a designed feature of the sacred symbolism. Professor Hardy has not carried over into his general thinking the rigour so characteristic of his strictly mathematical thought.

Again, if anyone tends to the view that really eminent mathematicians—or, at least, mathematical physicists—are *always* clear thinkers, let him read that penetrating critique *Philosophy and the Physicists* by the late Professor L. Susan Stebbing. Dealing particularly with the popular scientific expositions of Jeans and Eddington, and more especially with their incursions into philosophy, this acute logician provides us with an arresting vindication of the rejection, by modern psychologists, of the old " faculty psychology " and of the related doctrine of " formal training," that is of the teaching which asserted that general " faculties," e.g. judgment, existed and could be trained by special practices, e.g. study of the classics. First paying genuine and high tribute to these writers as eminent in their own sphere as mathematical physicists, Professor Stebbing proceeds by merciless analysis to expose in their popular works their departures from the rules and habits which govern scientific thinking and scientific exposition. Their use of deliberate equivocation, their appeals to emotion, their comparisons of the disparate, their use of disguised assumptions, their failure to define terms with the resulting inconsistency in the use of the terms and the consequent breakdown of their reasonings—by drawing attention to these and other traits, Professor Stebbing demonstrates once again that a brilliant mathematician is *not* necessarily a brilliant thinker in general. " The mathematics," in other words *pace* Lord Francis Bacon, do not make " an exact man "—except when he is doing mathematics.[1]

Now the proper function of mathematics in its applications to science, as indicated earlier, is not always recognized. It is sometimes considered, for instance, that the " certainty " attaching to rigid mathematical process passes over to the physical theories to the development of which mathematics is applied. This is confused thinking. It is, indeed, highly delusive. Mathematics touches physical science in two ways: (1) it comes

[1] The popular scientific expositions (e.g. *Universe of Light*) of that truly distinguished experimental physicist, the late Sir William Bragg, do, *per contra*, seem to be remarkably free from the faults specified in the text above. This is noteworthy.

in, in a rudimentary form, in scientific measurement, and (2) it works out deductively the consequences of any scientific hypothesis, that is, it " proves " what results must necessarily follow from the hypothesis. This does not prove the hypothesis but only tells us what to look for experimentally or observationally in order to do so. It is observation, with or without experiment that supplies the only kind of proof available. That it is necessary to state and insist upon this simple and elementary principle is amply evident. Not merely the man in the street but those who claim to be serious thinkers go astray here. Mr. Arnold Lunn, for instance, writes of Newton as having " an immense faith in mathematics as the final test of truth. ' The certainty of a mathematical demonstration ' was indeed the only certainty which he recognized as absolute."[1] Lunn thus confounds demonstration (which is deductive) with " the final test of truth " (which is observational). As a classical, if elementary illustration of the proper place and function of mathematics in science, it may be worth while to consider the prediction by Adams and Leverrier of the position and orbit of Neptune.

We notice four stages :—

(1) *Observation.* Perturbations of Uranus from its orbit as calculated on the supposition that the only bodies influencing it are the known ones.

(2) *Hypothesis.* The supposition is made that an unknown planet is possibly disturbing Uranus.

(3) *Mathematical Development of Hypothesis.* This consists of the calculation of the position, mass, etc., of a new and hitherto unobserved planet adequate to account, by its gravitational " pull," for the observed irregularities.

(4) *Observation.* Telescopes are directed to the calculated position. The new planet is seen. The hypothesis is confirmed.

Clearly the " mathematical demonstration " appeared in step (3) but the " final test of truth " did not come till step (4), and was furnished by observation. The " certainty " of the mathematical step merely told what certainly the observers must look for *and find* if the hypothesis was to be regarded as true. The truth of the hypothesis was not established until the calculations

[1] *Flight from Reason*, p. 37.

of mathematics were found to agree with actually observed facts. *In physical science mathematics does not furnish certainty as to the soundness of a theory.*

It should be added here, to avoid misunderstanding, that when such an able mathematical astronomer as Sir James Jeans writes, as he does[1] of "mathematical tests" of the various tidal theories of the origin of the planetary system, he is being brief rather than precise. His meaning is clear. The "mathematical tests" which were justifiably demanded of, though omitted from, the speculations he was examining, were really the mathematical development of those speculations—the development which, by tracing their necessary consequences, would have enabled them to be compared with the known facts of observation. The real *tests* are the comparisons with fact. The mathematical work merely makes this possible.

But more subtle and illusive are the attempts sometimes made to represent science as entirely mathematical. The pretence is that, to those well enough versed in mathematics, the laws of nature may become known without resort to experiment—that the competent mathematical scientist may cut himself clear of concrete facts and work entirely in symbols. Chief among those who have made such claims is the late Sir Arthur Eddington who asserts that the aim of science is to "construct a world which shall be symbolic of the world of commonplace experience."[2] It is to be doubted if many men of science would accept such a lofty and pan-mathematical statement of aim. Professor H. Dingle, says, for instance, that science is "the recording, augmentation and rational correlation of those elements of our experience which are actually or potentially common to all normal people."[3] Professor Niels Bohr's view is, "The task of science is both to extend the range of our experience and to reduce it to order."[4] Mr. Bertand Russell says, "Physics . . . however mathematical it may become depends throughout on observation and experiment, that is to say ultimately on sense perception. The physicist asserts that the mathematical symbols which he is employing can be used for the interpretation, colligation and

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[1] *Universe around us*, 4th edn., p. 244.

[2] *Nature of Physical World, Intro.* Any criticisms of this distinguished mathematician and scientist here offered must be understood to carry with them a tacit acknowledgment of his brilliance and merited distinction.

[3] *Science and Human Experience*, p. 14.

[4] *Atomic Theory and the Description of Nature*, p. 1.

prediction of sense-impressions. However abstract the work may become it never loses its relation to experience."[1] These pronouncements agree in assigning prime and ultimate importance in science to experience and not to mathematics. In contrast, Eddington's *aim* is to create a system which is postulational and deductive and therefore completely mathematical. To effect it he postulates " relata " and " relations," assigning to both the irreducible minimum of distinctive characteristics. These relata and relations thus characterized are his " building material." From them, he professes to derive, by purely logical or mathematical process, the properties of space and the field laws of physics (though not, it should be well noted, the laws governing the electrons, protons and other elements of atomic structure). The procedure is most highly abstract. The extreme tenuity of the physical significance of the notions employed makes the author's dexterous reasoning difficult to follow. What does become clear from expressions of misgiving and cloaked apology on his part is that the assigned building material is found inadequate, since the builder is compelled to introduce into the structure " specially prepared material " from other sources. He thus breaks the " rules of the game." Far from deriving the properties of his symbolic world by deduction from its original primitive elements *as postulated* the fact is that the would-be builder has, perforce, all along the line, to keep his eye on the well-known world of nature and from the observed facts of that world assign to his postulated elements such additional qualities as will *make* the " constructed " world resemble the world of nature. The justice of this criticism may be apprehended by a careful study of the appropriate sections of his *Mathematical Theory of Relativity* and *Nature of Physical World*.

> " Why *four* numbers (as monomarks of the primitive building elements) ? We use four because it turns out that ultimately *the structure can be brought into better order that way* ; but we do not know why this should be so. We have got so far as to understand that *if the relations insisted on a threefold or a fivefold ordering it would be much more difficult to build anything interesting out of them ; but that is perhaps an insufficient excuse for the special assumption of fourfold order in the primitive material.* . . . There is no reason to

[1] *The Scientific Outlook*, pp. 115–8.

> deny that a *diversity of worlds could be built out of our postulated material.* But all except one of these worlds would be still-born. Our labour will be thrown away unless the world we have built is the one *which the mind chooses to vivify into a world of experience.* The only definition we can give of the aspect of the relations chosen for the criterion of likeness is that it is the aspect which will ultimately be concerned in the *getting into touch of mind with the physical world.* But that is beyond the province of physics."[1]

What the world-builder here finds regrettable and calling for apology is (*a*) that his postulational elements are inadequate and have to be reinforced by observation, and (*b*) that the process of deduction is embarrassingly over-productive of symbolic worlds so that selection has to come into play. But what calls loudly for apology (which is not forthcoming) is his naive " identification " of the " ten principal curvatures " of his symbolic world with energy, momentum and stress, the familiar factors of our real world, " which are the subject of the famous laws of conservation of energy and momentum." As Professor Stebbing points out [2] this has nothing to do with logic. It is a fresh and large-scale *assumption.* In making it the builder is taking for granted Maxwell's laws expressed in his equations, which have behind them Faraday's assiduous and skilful experimental work, and equally Newton's formulations backed by the observations of Galileo and others. He is completely abandoning his logical game. We may remind ourselves that

> " When once the fixed conditions which any hypothetical group of entities are to satisfy have been precisely formulated, the deduction of the further propositions which also will hold respecting them can proceed *in complete independence of the question as to whether or no any such group of entities can be found in the world of phenomena.*[3]

But Eddington does not like this " complete independence." His mathematical world, if not built for the express purpose, has at least a sinister bearing which we are about to notice. He wishes on the one hand to import into this flimsy mathematical world of symbols the solidity and certitude attaching to the world

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[1] *Nat. Phys. World,* Ch. XI : my italics.
[2] *Philosophy and the Physicists* (p. 68).
[3] Whitehead, *loc. cit.* my italics.

of perceptual fact, and on the other hand to impart to the empirically discovered laws of science the mathematical character belonging only to his world of postulation and deduction. And here lies the mischief of this ruse. "Granting that the identification is correct," he argues, "*these laws are mathematical identities*. Violation of them is unthinkable."[1] But as we have seen, the mathematically obtained structure exists apart from all relation with the real world. If the mathematics shows that *its* laws are truisms, i.e. that they follow necessarily from the definitions of the primitive elements, this fact has nothing to do with the laws of existing science, which are simply formulations of observed recurrences and regularities in nature. These do not follow from any definitions. They follow from—they are inductions from—perceptual experience. In short, they are observations. The only part mathematics plays is in their formulation. This principle is of the greatest importance. It bears closely on the relation between the laws of science and the admissibility of "miracle" to rational thought. If the field laws are mathematical identities, their infringement is, as Eddington proclaims, not merely impossible but *unthinkable*, for they are a mere paraphrase, as it were, of the definitions of the constituent elements. This would rule out miracle—finally. But as we have maintained, these laws are nothing more—despite Eddington's attempted legerdemain—than the periodicities and regularities of nature which have been the subject first of observation and then of mathematical formulation. They are based on observation. But so are the records of the authentic miracles of Biblical theology. Believers in the latter may hold to their belief in complete and consistent rationality. Indeed the irrationalism is with the unbeliever. For the rational admissibility of competently observed and duly attested miracle is seen to be *inherent* in the logical make-up of inductive scientific method.

If further confirmation of the true part played by mathematics were needed it is amply supplied by the history of science. In the course of the actual development of scientific knowledge the process has *always* taken the form of an alternation—a blending—of observation with theory, whether strictly mathematical or otherwise. This is true both of the older classical discoveries and also of the more recent and much more highly theoretical

[1] *loc. cit.*, p. 231 (Everyman Ed.) Italics in original.

advances associated with the well-known names of Einstein, Heisenberg, Schrodinger, Dirac, De Broglie, Born and the rest. Writing for instance of the General Theory of Relativity, a scientific development in which mathematics, notably the theory of tensors, played a prominent part, Professor Max Born says, "The new theory is a gigantic synthesis of a long chain of empirical results, not a spontaneous brain wave."[1] It was by experiment, moreover, that the theory was regarded as established when the deflection of light predicted by it came under actual observation. Prof. Born gives numerous similar examples.

> "It is often said that it was a metaphysical idea which led Heisenberg to the principle of matrix mechanics, and this statement is used by the believers in the power of pure reason as an example in their favour. Well, if you were to ask Heisenberg he would strongly oppose this view. As we worked together, I think I know what was going on in his mind. At that time we were all convinced that the new mechanics must be based on new concepts having only a loose connection with classical concepts as expresssed in Bohr's postulate of correspondence. *Heisenberg felt that quantities which had no direct relation to experience ought to be eliminated. He wished to found the new mechanics as directly as possible on experience.* If this is a 'metaphysical' principle, well, I cannot contradict. I only wish to say that *it is exactly the fundamental principle of modern science as a whole, which distinguishes it from scholasticism and dogmatic systems of philosophy.*"[2]

This writer closes a most valuable and authoritative survey of very recent science with the following: "My advice to those who wish to learn the art of scientific prophecy is not to rely on abstract reason but to decipher the secret language of Nature from Nature's documents, the facts of experience."[3]

When Mr. Bertrand Russell said that "mathematics is the subject in which we neither know what we are talking about nor whether what we say is true"[4] he was in no way disparaging mathematics but merely portraying its abstractness. In mathematics alone, of all the sciences, is abstraction complete;

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[1] *Experiment and Theory in Physics*, p. 14.
[2] *ib.* p. 18—italics mine.
[3] *ib.* p. 43.
[4] I regret that storage of my books prevents a precise reference to the source of this well-known dictum.

and it is abstract from beginning to end. From the moment when, in the kindergarten, the young child recognizes that notwithstanding the different pictures on them, two blocks here equal two blocks there, the degree of abstraction increases apace until a stage is reached in which the student may be able to discuss the doctrine of propositional functions or manipulate anti-commuting operators in the study of group structure. All the concepts of mathematics are entirely remote from actual experience. No one, for instance, has had experience of a geometrical point or a geometrical straight line. Further, the deductive systems of mathematics, as we have already seen, are such that they may never correspond to anything given in experience. There are many systems of geometry, for instance, founded on different sets of axioms and postulates. And of these one only can correspond to real space. (Which one actually does so correspond a cautious thinker would agree has yet to be finally decided.)

It is easy to see the immense power gained by this abstraction. All the utilitarian and cultural values of mathematics from simple counting to the theory of numbers and from simple mensuration to elliptic or hyperbolic geometry spring from it. What is not so often taken account of is the loss resulting from abstraction. Absurdly extravagant claims for mathematics are often made by those who lose sight of this. It is only in a very restricted sense—the numerical sense—of the word "equal" that two pictured blocks are equal to two other pictured blocks even of the same form and dimensions. At this very early kindergarten stage even, the child, in order to grasp the numerical concepts, has to abandon mentally the pretty and varying pictures and colours, the positions and orientations, the nearness or remoteness, roughness or smoothness, considerations of material, ownership, intrinsic worth and the like—in fact everything that is qualitatively, psychically, ontologically rich and varied. Our mathematical savants are too prone to leave this profound fact out of consideration. When it is said, for instance, that "all the pictures which science now draws of nature, and which alone seem capable of according with observational fact, are mathematical pictures,"[1] or again when the same writer suggests that "the Great Architect of the Universe now begins to appear as a Mathematician,"[2] he forgets that for the purposes appro-

[1] Sir James Jeans, *Mysterious Universe*, p. 127.
[2] *ib.* p. 167.

priate to mathematical physics he has been compelled to view the universe through the spectacles of complete abstraction. He has seen it only in its quantitative and relational aspects. It surely is not very intelligent or profound to ignore everything that is not mathematical and then to announce as a discovery that all one sees is mathematical. Of course our chemists, psychologists and biologists, not to mention our poets, artists and theologians, have their own views on this. What " picture," for instance, can mathematics offer us of the mysterious link between brain, which is physical, and thought, which is psychical —or of the laws which regulate the interaction between the two factors, so totally diverse yet so intimately bound together? What of colour? The influence of mathematics in science is such that we cannot investigate colour scientifically without *losing* colour in all its richness and deep psychic significance and finding ourselves alone with a bare number—a wave-length. Physics is not the whole of science and science is not the whole of thought. Neither is thought the whole of life.[1] The universe is richer in every way than can fall to the lot of a mere mathematician to imagine or a mathematical physicist to discover. There are multitudinous aspects of objective reality which cannot be brought into the domain of mathematics. These qualitative features which constitute so great a part of what may be called the ontological richness of nature, are an essential part of the domain of science over and above the merely metrical aspects; and, properly viewed, not a whit less important. They are, indeed, an indispensable check on the otherwise uncontrolled tyranny of numbers and of mathematical form. Further, as Dr. W. R. Thompson, F.R.S., demonstrates,[2] the metrical is itself dependent on them—the quantitative is dependent on the qualitative. For example, our perception of space is based on the perception of bodies; and our apprehension of the tridimensionality of bodies is one of form.

Nor is the loss by abstraction without its serious side even *within* the realm of the quantitative—a seriousness which calls for a firm retention of hold on reality and common sense and the placing of the feet firmly on the ground of experience. This necessity is capable of elementary illustration. As the tyro in algebra knows, the mathematical formulation of an everyday

[1] See Lamont, *Christ and the World of Thought*, preface, p. v.
[2] *Science and Common Sense*, p. 105.

problem, say by means of a quadratic equation, may lead to numerical results which are inapplicable to the problem in hand. In fact, the numerical results furnished by the equations may be (*a*) directly applicable as solutions of the problem, (*b*) totally inadmissible (e.g. a negative number of children in a family) or (*c*) applicable as solutions not of the actual problem from which they arose but of a similar but modified problem (e.g. external, instead of internal section of a line-segment in a given ratio). Whence come, then, these inapplicable roots of equations? The equations give us *all* the cases in which certain numerical relations hold. The actual problem admits perhaps of only one of these as its solution. Why then does the actual problem bring us to the numerically more comprehensive equation? The answer is that in committing ourselves to the merely quantitative aspects we are committing ourselves to all the relations which may hold between the numbers expressing these quantitative aspects while at the same time abandoning the qualitative features of which the numerical relations take no account. These qualitative features if held in the mind would save us from error by serving as limitations and checks; but they find no entry into the equations. Whatever numbers the latter may bring us to, a man cannot have a negative number of children in his family, and a length of wire cannot be divided where it is not. Mathematics is formal. As the Aristotelian would have it, between the numbers and their relations on the one hand and the material facts of the problem on the other there exists the difference corresponding to that between formal causes and efficient causes. For complete soundness of mind, it would seem, we must attend to them both.

E. Cassirer says[1] "Every mathematical function represents a universal law which by virtue of the successive values which the variable can assume contains within itself all the particular cases for which it holds." This is not to be denied. But it is a wholly mathematical and therefore abstract truth. Commenting on it Miss Dorothy Emmet remarks, "This is plausible in mathematics because here we are *not concerned with empirical elements* but with the development of an idea defining a functional relationship."[2]

A further citation from Whitehead should sufficiently illuminate this point. "A complete existence is not a composition of

[1] *Substance and Function*, p. 21.
[2] *Nature of Metaphysical Thinking*, p. 72, my italics.

mathematical formulæ, mere formulæ. It is a concrete composition of things illustrating formulæ. There is an interweaving of qualitative and quantitative elements. For example when a living body assimilates food, the fact cannot be merely that one mathematical formula assimilates another mathematical formula. . . . The fact is more than the formulæ illustrated."[1]

It is abundantly clear then that the very abstraction which endows mathematics with its great power and beauty imports into it the dangers accompanying all formal studies—the dangers and losses due to remoteness from reality. The only safeguard against these is constant reference to the real, the experiential —indeed to the observations, intuitions and reason of the ordinary person, that is to common sense. Mathematics and all true science transcend common sense. But if they at any time *offend* it, a good case can be made out for the view that it is the suggestions of the mathematician or the notions of the scientist that are in danger of departure from truth rather than those of common sense. A considerable treatise could be written on the meaning and importance of common sense. It is here used to denote that general intelligence with which we arrive at valid conclusions—the quality or endowment which is necessary to the ordinary citizen in the solution of life's problems, to the juryman in arriving at a true verdict, to the scientist (only in this case with the aid of technical refinements and already accumulated specialized knowledge) in forming inferences from his observations and experiments. The difference between the scientist and the man of mere common sense is one of elaboration of method and apparatus and of previously acquired specialized knowledge—of intellectual level rather than of intelligence. A further difference is that common sense is stimulated to action by the extraordinary, that is by a problem in life, whereas the intelligence of the scientist is stimulated even by the ordinary. "It requires a very unusual mind," says Whitehead,[2] "to undertake the analysis of the obvious." But, once set in action, common sense follows exactly the same general procedure as science. The stages have been excellently exhibited by Professor Stebbing,[3] who resolves into their elements the thought and activity of a man who reaches the door of his flat to find it bolted against him from within.

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[1] *Adventures of Ideas* (Ch. IX).
[2] Cited by Stebbing, *Mod. Intro. Logic*, p. 235.
[3] *ib.*, pp. 233 *et seq.*

(1) *The observed fact* (the bolted door) sets up a problem. There is something to be "accounted for." The bolted door is an unusual feature in a complex situation.

(2) *An explanatory guess is made.* A burglar! This would *connect* the unexpected fact with other facts and make it fit in a complex of ordered fact.

(3) *Results of the attempt at explanation are worked out.* If a burglar, then he is either still within or has got out; but door is bolted on inside; exit from third floor window impossible; doubts exist at this stage of the validity of the "burglar hypothesis."

(4) *Inspection.* Forces the door and examines everything within. Burglar has left obvious traces and made his exit by parcels lift. Guess verified.

Comparison of these steps with those given earlier in this paper shows that the thought processes of science and common sense are exactly similar. The latter is the basis of science or as T. H. Huxley said, "Science is organized common sense." Nevertheless Sir James Jeans frequently writes in such manner as to identify common sense with obscurantism. He certainly implies that in adopting the doctrine of a spherical earth he abandoned his common sense.[1] Professor Lancelot Hogben also tells us, with considerable complacency, that he long ago gave up his belief in common sense.[2] It is preferable to say that in both these cases the common sense was retained, though plied with numerous additional facts of observation. The suspicion arises that this depreciation of common sense is undertaken in the interests of modern *doctrines of science which will not stand up to common sense scrutiny.* This does seem to be the case. It is well illustrated by the treatment accorded to time.

The concept of time, as Thompson makes clear,[3] is indefinable. (If anyone questions this let him produce a definition avoiding circularity.) It is indefinable because it is logically irreducible and it is logically irreducible because it is a primary intuitive concept. In itself it is a non-mensurable quantity, for we have

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[1] *See New Background of Science*, 2nd. edn., pp. 44–5, 118.
[2] *Nature of Living Matter.*
[3] *loc. cit.*, pp. 88–105. See the whole section to which the present writer is for much of the following argument greatly indebted. The whole book merits close study.

no direct means of equating units of it. It cannot therefore of its own right enter into mathematical formulæ or equations. It is only by virtue of its close relation to change, especially change of place, which *is* directly susceptible of quantitative expression, that it can be correlated with quantity. *Thus only indirectly can time be brought into the world of mathematical equations.* Moreover, time is irreversible. We may move backwards and forwards repeatedly through a point in space, but not through an instant of time. Now to employ time as one of four terms or variables in a "four-dimensional framework," as our mathematical physicists do, is to engage in the following procedure. Three symbols (the usual x, y, z of cartesian coordinates) are assigned for the three (Euclidean) spatial dimensions. A fourth symbol, t, is taken as representing time. In reality, this represents, not time, but a distance traversed by the hands of a clock; it is thus not truly a fourth dimension but one of the three ordinary spatial dimensions. It is, however, *called* a fourth dimension by analogy with the three real dimensions of space. This amounts to the substitution of an extra "dimension" for what is a real, intuitively apprehended, irreducible and irreversible flux, well-known as "time." There soon follow, with too great facility, (i) the treatment of t as positive or negative, (ii) the adoption of further symbols (e.g., p, q, r, etc.) which are also described by analogy as still further "dimensions" thus creating a "multi-dimensional" framework, and finally (iii) the embodiment of these in mathematical systems. What is the position, then, if such symbols have been built up into a system of equations from which the mathematician has obtained a set of numerical values identical with those of some natural process? *What is verified thereby? Not, most certainly not, the idea of time as dimensional or reversible; nor the physical existence of "space-time"; nor the physical reality of space of more than three dimensions.* For (as W. K. Clifford wrote in an analogous context) "whatever can be explained by the motion of a fluid can be equally well explained by the attraction of particles or the strains of a solid substance; the *very same mathematical calculations result from the three distinct hypotheses;* and science, though completely independent of all three, may yet choose one of them as serving to link together different trains of physical inquiry."[1] What

[1] Cited in Stebbing, *Mod. Int. Logic*, p. 208; italics mine.

then is verified ? Simply the power of the mathematical formulation to throw into pattern or link together, i.e. to colligate, the quantitative aspects only of the results of physical inquiry ; and nothing more. For, of course, we must not forget that in order to reach this form we have abandoned the qualitative facts which serve to distinguish one entity from another and one mode of action from another.

If we insist that the verification applies to the physical reality of time as one of the dimensions or as reversible, or to the physical actuality of quadri- or multidimensional space, we must, for equally cogent reasons, be prepared to believe that when certain equations were found to give numerical values corresponding to those of the experimentally determined properties of light, these equations proved both the actual existence of the ether and at the same time that it was, simultaneously, a mobile fluid, a nebula of discrete particles and an elastic solid. And we must for the same compelling reasons believe that a refractive index of $\sqrt{-1}$, or one explicitly involving it, is, or has a physical reality. For according to Professor Bouasse[1] " Fresnel produced a theory of total reflection by postulating a refractive index containing explicitly $\sqrt{-1}$. Following the same line, MacCullagh and Cauchy constructed a theory of metallic reflection. The formulæ deduced from this hypothesis—*perfectly and deliberately absurd*—are in accordance with the facts, which are facts of a scale large enough to make the result important. The formulæ may therefore be considered good formulæ, and, in the sense previously considered, *true* formulæ. Their goodness or truth is not, however, judged by the conformity between the basic hypothesis and physical reality, but merely by their capacity to produce numbers in reasonable agreement . . . with those obtained by the measurement of nature."

But our mathematico-physicists will not see this. Instead, they endeavour to foist upon us such quite unacceptable illustrations and justifications of these hypothetical physical " realities " as are scattered throughout their writings. Russell, Jeans, Eddington, J. B. S. Haldane and others are equally at fault here. Their attempts are worse than misleading. They are an affront to the very common sense to which they purport

[1] *Scientia*, p. 22, Vol. XXXIII, 1923, cited by Thompson, *loc. cit.*, p. 87. Italics in first italicized phrase mine.

to make appeal. Eddington's "non-Euclidean world," as seen in a polished brass door knob[1] simply shows how a polished Euclidean surface can give a distorted image, which is, however, itself of course Euclidean. Haldane's Riemannian universe[2] is described, as Thompson points out[3] in terms such as "up," "down," "around," "the other side of," etc., which come from the intuitions of reality and which therefore *cannot* enable us to envisage a world of radically different geometry. We must know, first of all, what *is* "up," what *is* "down," what *is* "the other side of" in the Riemannian world. Haldane's light-hearted optimism, then, does not carry us very far. Russell on relativity is no better when he imagines an escalator moving with the speed of light, which of course no material object ever did or could do.[4] As for Jeans's illustrations of "curved space"[5], he both attempts to help the reader to imagine curved space[6] and asserts the impossibility of imagining the illustration.[7] All such would-be illustrators ought to bear in mind in framing their illustrations, what they of course quite well know as fact, that it is not a departure from parallelism, perpendicularity or flatness that establishes a region as non-Euclidean (for all these features occur in objects in Euclidean space); it is therefore in the power of none of these features to illustrate, even, Riemannian or other non-Euclidean space. What is necessary is radically different ideas about what constitutes parallelism, etc. Therefore, a region of space marked by bending, non-rectilinearity, distortion, etc. canont even *begin* to illustrate a world of "curved space." All it can do is to stimulate the imagination to picture *something different*, but the world so pictured will always be and must always be pictured in imagery which is Euclidean—our imagination having no other material to build with. To *conceive*, by means of a set of mutually consistent definitions and postulates, a world of Riemannian or other extraordinary space is possible; to build mathematical systems based upon such conceptions and to embody them in scientific theories is equally possible, and may be useful. But to imagine such a world visually or to prove by any number of numerical "verifications" its real

[1] *Space, Time and Gravitation*, p. 11.
[2] *Possible Worlds*, p. 261.
[3] *loc. cit.*, p. 74.
[4] *ABC of Relativity*, p. 36.
[5] See *New Background of Science*, 2nd edn., pp. 120–1, 136–9.
[6] p. 137.
[7] p. 139.

existence is a totally different matter. It is a conception which is uninterpretable in real terms or in images drawn from the **real.**

And yet the mathematical physicists are not content to leave the matter thus. Professor G. Castelnuovo[1] urges that " though the utility of the concept of space-time constitutes a sufficient justification of it, one must go further and say that it constitutes *as an object of sensory perception*, an essential element of relativity theory."[2] If relativity theory really depends on this sensory perception of space-time, the theory is hopelessly ruled out, even if in the restricted sense " true," i.e., useful in providing numerical values which correspond with those given by experiment. But why this insistence ? It can only be because the mathematical physicists have an uncomfortable conviction that they have ejected the sensory and intuitive elements from their schemes, and feel compelled, in lieu of replacing them, somehow to fill their place, since it is admitted that science must begin with observation and must finally return to it. The elimination of the sensory, like the deprecation of experiment, must result in a false science, in that it makes inordinate claims for what is after all only one factor—and that a strictly formal one—in scientific process, to the detriment of the remaining factors. Common sense would, on the other hand, decry such a procedure from the outset.

To revert a little, the replacement of the intuitive concept of time by a dimension is the repudiation of the real nature of time, which is succession. It amounts, further, to the rejection of real causation, which is seen in succession, and which cannot be got into equations. This repudiation is, as we have seen, effected by a mere change of name. Time is called a dimension and treated as if it were such. Time thus treated as a dimension is really space, though called time. Of this process of the substitution of a " quantitative correlate " for an entity which is not quantitative and hence is " refractory to mathematical process," Thompson says in a pregnant passage, " *These homonyms of real things* undergo, in the mathematical world, certain transformations that are indeed consonant with their true natures of mathematical entities, though altogether repugnant to the natures of physical realities ; but *the names they*

[1] As already cited *Trans. Vict. Inst.* 1943, p. 88.
[2] See Thompson *loc. cit.*, p. 92.

continue to bear create in the investigator the illusion that he is recasting the philosophy of nature. Thus we have particles without substance and waves that are not, for the mathematician, waves of anything, and indeed represent nothing more than an attempt to portray in a language that has evolved in a world of tangible realities the unsubstantial and indescribable figments of the mathematical universe. These myths or metaphors—translations of the untranslatable—have, however, been organized by the mathematical physicists, particularly the exponents of the Theory of Relativity into *an engine destructive of common sense,* which remains, as we have already said, the basis of the inductive sciences, as of normal thought."[1]

We live in an age of the easy acceptance of the unintelligible. There is a type of mind to which the very unintelligibility of a doctrine may commend it. But we should not accept the muddiness of a stream as evidence of its depth. "It is a safe rule to apply that, when a mathematical or philosophical author writes with a misty profundity, he is talking nonsense."[2]

The mathematicians, moreover, should put their own house in order before seeking to direct and to dominate in the world of science. There are serious and unresolved differences among them. They are not even in agreement about so fundamental a concept as number. While Russell makes it a generic concept arrived at by abstraction of the common elements of a group of objects, and so defines it as "the class of all classes equal to a given class," Cassirer makes it a relational concept, i.e., one derived from the notion of a relation between symbols in a certain form of serial order. It must be admitted that Cassirer's view has much to commend it. The difference may be one of those due to the difference between the analytic and the synthetic approach. Certainly number would never have been *reached* as a "class" concept, whatever may be revealed by analysis of the concepts, since "the individual groups must first be determined as ordered sequences of elements (i.e., by the ordinal theory, according to which what a number is depends on its place in the system)."[3] We cannot go into this. The difference remains. Also the acute differences between the thorough-going logicians, the formalists and the intuitionists are apparently accentuated

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[1] *loc. cit.*, p. 93, italics mine.
[2] Whitehead, *Introduction to Mathematics*, p. 227.
[3] See *Nature of Metaphysical Thinking*, Miss Dorothy Emmett, pp. 71 *et seq* for a readable discussion.

rather than resolved. The brilliant British mathematical philosopher F. B. Ramsey, who regrettably died (1930) at the early age of 26, had written in 1925 expressing the hope that the serious logical faults in *Principia Mathematica* which have caused its rejection by many and the desertion of its line of approach could be removed.[1] At the time of his death, he was, however, coming to agree that there are irremediable errors in its system.[2] If this is so, mathematics, although characteristically logical, is after all irreducible to logic and has a different kind of necessity whose nature is extremely obscure."

Leaving these uncertainties to the mathematicians to whom they belong, let us recapitulate.

Far from mathematics being primary and dominant in science, to assert that it is so is the reverse of the truth. There are vast tracts of the true domain of science outside mathematics, which is the farthest from reality of all the sciences. True science might well encompass a great advance if this were heeded and acted upon. The dominant *influence* of mathematics in recent science has been such that great loss has been suffered by the latter on account of the abstractness of the former, a rich variety of the qualitative aspects and relations of nature having been inevitably lost in the passage through the mathematical sieve. There is more than loss. Arising from the formality of mathematical methods there is danger of introduction of positive error if, by way of test, touch is not closely maintained with observable experience. Confusion exists in the minds of mathematicians between the forms of their descriptions and the real world itself. It is illustrated by their toying with the idea of the reversibility of time. But time is absolutely irreversible. The universality and the hypostatic character of the quantitative and mathematical in nature are only apparent. They are " idols of the cave "—a mere result of viewing the world mathematically and by no other method. Hence, to regard mathematics as a pointer to the spiritual nature of reality is dangerous and misleading. Mathematics plays its valuable part in (*a*) the " quantization " of observation and (*b*) the deductive development of scientific theory, in both serving to give precision. But a theory is scientific in the strict sense only if it admits of development and testing. A theory is unscientific not because it rests on unproved assumptions but because it rests on assumptions of such

[1] F. B. Ramsey, *Foundations of Mathematics*, p. 1.
[2] R. B. Braithwaite, *Cambridge Studies*, Ch. I, *Philosophy*, p. 20 (1933).

a kind that testing them is out of the question. Of such sort were the mythological assumptions invoked by the Egyptians to account for the phases of the moon. Equally mythical are the mathematical theories of " curved space " and the like. They are incapable of being tested except by the giving of numerical coincidences, which as we have seen is inconclusive. Further, these myths infringe the rules of scientific terminology; for scientific terms should be unique in their reference, unambiguous and precise. " Curved space " merely confuses. Things may be curved *in* space, but " curved space " is unthinkable, because of the nature of the notion of space—an abstraction from our intuition of form. If the mathematical formulæ and equations associated with the hypothesis of curved space are found *useful*, in that they give numerical results coinciding with experience, well and good. That is, however, no justification for the introduction of an absurd analogy, much less a proof of its physical reality. That such notions are absurd and offensive to common sense is proved by the illogicality and inconsistency of the attempts to justify and illustrate them. They are of a piece with the homonymic falsities which create " dimensions " gratuitously and represent time as a dimension.

Mathematics has been of great and acknowledged use in some of its applications. Where it has been of the greatest use, e.g., in celestial mechanics (the " perfect science ") and in engineering, it has worked most closely, hand in hand, with observation, experiment and practical knowledge. And its success in such branches is due to the fact that in them quantitative factors are of the very essence of the subjects and so are necessarily prominent.

In short, there is no magic in mathematics. It is the science concerned with deductive reasoning, mainly occupied with number and quantity. If this reasoning is built up on assumptions unfounded in experience, we have pure mathematics, which exhibits much beauty and inventiveness in its theoretical constructs, but which is detached from experience in both its foundations and its results, and so is, from the practical standpoint, valueless. If the reasoning is, however, based on data which are the results of experience, we have applied mathematics. This is an entirely *dependent* subject, for not only its data but the necessary tests are also experimental. Mathematics does *not* hold the primacy. It is a valuable servant but a tyrannical and untrustworthy master.

WRITTEN COMMUNICATIONS.

Brigadier N. M. McLEOD wrote: At first sight the above paper looked formidable, not to say rather "high-brow," but when I saw the name E. H. Betts my fears vanished. Knowing the author's rare gift for rendering simple the most forbidding and complex argument I rather settled down to read and enjoy every word.

May I in support recall to mind the classic example of mathematical absurdity? I refer to the mathematical explanation of the *supposed* "*real*" *result* in the famous Michelson-Morley speed of light experiment, which consisted in proving, to the satisfaction of many of our leading scientists, that the ether of space consisted, not of a material medium capable of transmitting waves, but of mathematics, pure, but curved!

But, we may well ask: What becomes of this mathematical theory when it is known that the result of the experiment was *not a* "*real*" *one*, as had been assumed by certain scientists, against the conclusion of the experimenters themselves? For, not only did they, the experimenters, repudiate the false assumption, but a long series of further, much more elaborate and accurate, observations were carried out at Ether Rock, Mount Wilson, in all of which the ether stream was not only detected, but measured.* In the words of Prof. Piccard, "It vanishes as soon as the Michelson-Morley experiment comes within the scope of known physical effects"; or, in the words of Einstein and his colleague de Silter, during their stay at Mount Wilson in 1932: "We must conclude that at the present time it is possible to represent the facts without assuming a curvature of three dimensional space."† And yet there are people who still believe in the mathematical "curved-space continuum"!

Mr. E. W. SIDDANS wrote: I have found Mr. Betts' paper a very interesting and inspiring attempt to deal with difficult ideas.

He seems to take a rather dim view of the attitude of a "pure" mathematician (pp. 4 and 6) and to exalt the value of observational

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* "The Ether Drift Experiment . . ." Reviews of Modern Physics. Vol. 5, No. 3. July, 1933.

† Proceedings of the National Academy of Science, Washington. 15th March, 1932.

tests and common sense in deciding " final truth " (p. 8). Yet (p. 14) he agrees that cautious thinkers are still not sure what system of Geometry " corresponds to real space." (What does " real " space mean ?)

The stress on what mathematics cannot deal with (p. 15) nor words explain (p. 20) is very good, but I doubt if the remarks about Time (pp. 18 and 19) and its non-availability for mathematical treatment are sound.

In mathematics, we conceive, say, length and the equating of units of it without worrying if the experiment can actually be performed—so why not treat Duration in the same way ?

It would have been good to read a concluding paragraph summarising the relationship which Mr. Betts would like to see between the faith of a Christian mathematician and his special subject. In particular, I should greatly value any suggestions which would show how a teacher of mathematics can present his subject so as to be a positive ally to those which more directly stimulate a Christian faith.

Mr. W. E. LESLIE wrote : I am not sure whether Mr. Betts accepts the Special and General Theories of Relativity. Will he please say clearly whether he does so ?

On page 19 he objects to expressions such as x, y, z. t. But if it is not proper to associate t with space co-ordinates it is not possible to give mathematical expression to motion—which sweeps away almost the whole of mathematical physics ! When Mr. Betts speaks of the distance traversed by the hand of a clock, does he mean a lady's wrist-watch, or Big Ben ?

In the early part of the paper we are given primary intuitions, logical inferences from those intuitions, experiment and observation as the tests of truth. But later the author adds to these very clear terms another test, " common sense." In so far as this includes intuition, logic, experiment, and observation, the use of a fresh term is unnecessary : in so far as it excludes them its value is very dubious.

Mr. LAURANCE D. FORD wrote : Mr. Betts' interesting paper on " The Use and Misuse of Mathematics " prompts the thought that

mankind in its modern thinking has seriously erred. It appears that the same perverseness which in the field of Biology produces the fallacy of Evolution, in Pictorial Art gives birth to surrealism, cubism and the cult of the repulsive and ugly and, in Music, afflicts us with the cacophony of atonalism, has also extended to the hitherto unimpeachable regions of mathematics and produced such contradictions of thought as "*curved space*" and "*reversible time.*"

Have we arrived at a position with regard to the intellectual advancement of man analogous to that spoken of by Shakespeare, who says that we "ripe and ripe" and then that we "rot and rot"? There comes a time in furbishing a knife-edge, when you cease to make the blade any sharper, and begin to make it smaller.

As in all mental processes there is development, so, to all development (at least as far as man is concerned) there is a period somewhere or other. If he, by forcing things, will go the other mile, he finds his latest advances are no advances. He is like the infant sucking from its milk bottle after the milk has gone: he keeps up the motions of drawing fresh supplies, but they are only wind.

Have we come to the place in Scientific development of thought where we have reached dead centre (the zenith), and, refusing to accept the sentence of our limitations, press on and on, only to find we begin to descend the other side of the circle? And what lies before us then?

Somewhere or other, sometime or other, all researches must lead us either to God or the blackness of darkness of ignorance of all things—but God has made Himself accessible to man in Christ Jesus without scientific researches at all, or either the use or misuse of mathematics.

I am indebted to Mr. Betts for putting so plainly what I have often "*felt dimly.*"

Mr. C. S. GRANT wrote: In Chapter I of his *An Outline of Philosophy*, Bertrand Russell proposes not to define "philosophy," and proceeds to indicate those "problems and doubts" which beset philosophy and make Fausts of us all: "Alas, I have explored philosophy, and" etc., etc.* No definition of philosophy nor of a

* *Goethe's Faust.* Translated by John Anster.

science can be complete—so far as it can be made complete—unless it is definition by the subject matter itself. I have not (I think) lost my peace of mind, but with Faust : " And here I am . . . , No wiser than at first ! "

No branch of science nor of any learning can be seen in perspective if not seen in relation to all the rest of science and learning, and we know next to nothing of anything (if we would admit it), even when Sir James Jeans can write of the new quantum theory, " For it enables us—in principle at least—to predict every possible phenomenon of physics, and not one of its predictions has so far proved to be wrong. In a sense, then, we might say that theoretical physics has achieved the main purpose of its being, and nothing remains but to work out the details."*

" In a sense, ... nothing . . . . " ? Theoretical physics cannot be " seen " by looking at theoretical physics alone, any more than we can " see " an apple if we do not notice the tree and much else that too few would dream of imagining to be the very knowledge we are really after. How many pigeon-hole compartments of science and learning are there ? How many should there be ? Difficult would it be to possess knowledge in one piece ! Scarcely do I think that I am " with useless learning curst," but I have a deep sympathy for the restless Faust, in that arched, Gothic chamber.

To say that one equals one is not to open discussion on the profundities of mathematics, but though that little equation was familiar to the Babylonians and Egyptians long before the Christian era, neither could have told me why one equals one, and I still do not know why I should trust such an apparently simple-looking statement because I must, and because it has never let me or anybody else down, or because every little boy and girl would look at me if I dared mention these reflections to them.

The logical process of induction on the validity of which we must repose our faith if ever we are to trust a scientific law, *appears* to be no less well and truly founded than our faith in the simplest of equations. Faust perhaps thought it too terrible to contemplate the confusion and danger of lost faith should someone suddenly cast doubt upon the wisdom of the great scientists in their simple

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* *Physics and Philosophy.*

faith. Undoubtedly, the necessity for such wisdom is the most awkward thing in the whole theory of knowledge.*

Science must place that faith in the vast edifice which it is building for itself, or it must perish. But the mystery about that stately edifice deepens. Sir Arthur Eddington has told us: "*Our present* conception of the physical world is hollow enough to hold almost anything . . . . A skeleton scheme of symbols proclaims its own hollowness." Italics mine. Again, "It can be—nay it cries out to be—filled with something that shall transform it from skeleton into substance, from plan into execution, from symbols into an interpretation of the symbols."† So perhaps I am not alone with my faith in believing that nature does not intend that our footfalls shall resound indefinitely as in an empty hall.

It might seem from the amount of evidence available, that mathematics might be better regarded as the science of ideas *par excellence*, in contrast to the outlook which looks at it—correctly from one aspect—as a "skeleton scheme of symbols." Pure or applied, mathematics without *ideas* is unthinkable, and if it were not, it would be as useless as the great bulk of philosophy which wrangles about the meaning of words, rather than go to the infinitely greater trouble of finding meanings and then words, inventing new words just as would be necessary.

Mathematics is termed an abstract science, but, pure or applied, if it is to be intelligible, it must deal with facts of experience, every time. If the philosopher does not think so, the mathematician in him is not worried. For 1,800 years the Greeks studied conic sections as an abstract science, but for 1,800 years they made calculations about *things*, of which they had knowledge by the senses. If I cannot define unity to my satisfaction, I do not hesitate to believe the idea is arrived at by the senses, in the same way as the idea of hunger. For me, one egg is one egg; shell and all. If I have two eggs, *one* egg is equal to *one* egg, no matter if one of them is bad, and I have abstracted nothing, any more than I have abstracted the roof of a house when I knock at the door. Sufficient for me that for the

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* W. A. Sinclair (University of Edinburgh) has a philosophical theory which would explain why one should accept this "faith." Chap. IX, What is Truth? *An Introduction to Philosophy.*

† Epilogue, *New Pathways of Science.*

one egg I can produce the other. It is up to the other person what he does with the bad egg, if he gets it. The mathematical point is still there under the imaginary but powerful microscope, still as uneven to look at as a somewhat larger point under the less-expensive magnifying-glass. Otherwise—bad philosophy.

The only possible way to appreciate thoroughly the so-called Arabic system of notation (which evolved slowly, and is itself a structure of ideas) is by some means to be compelled to make do without it when making difficult, prolonged calculations and when inventing new mathematical *ideas*. The reputation of mathematics for difficult ideas in innocent-looking dress is not lost by describing a small circle and calling it zero. Descartes (not to overlook Fermat) fortunately prescribing an easy life, at least for himself, invented the method of co-ordinate geometry. Without Descartes, no Newton's *Principia*. Eureka! Ideas come anywhere—this time in the bath, perhaps because the idea of specific gravity is easier than its applications in school books. It is the idea which is important. Lastly, we have the invaluable idea of the variable; worth its weight in gold equal to the weight of ink wasted in the teaching of mathematics minus illumination by ideas.||

Ideas build up and lead to the independent discovery of the differential calculus by Newton and Leibnitz. Without Newton's ideas, Einstein could not have started a reign of ideas—in the boldest and most comprehensive fashion—the like of which has not been known before and which cannot yet be seen for its use in broadening and deepening the brooding spirit of man.

If undue emphasis appears to be placed upon (these somewhat disjointed) philosophical flights, only through its problems and doubts, no less than through its achievements, can the science of mathematics be seen as it "really is." In the task of understanding the problems and doubts is the great difficulty in a criticism or appraisement of mathematics. I regard as suspects the problems and doubts I have mentioned. They are too problematical and cumbersome, and somewhere so much in the way of philosophical thought that we are reminded of a bad, involved and unwieldy hypothesis which has required too much explanation to be convincing.

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* These examples illustrating the *ideas* in mathematics are expanded in *An Introduction to Mathematics* by A. N. Whitehead, to which I am indebted.

Mr. R. T. LOVELOCK wrote : The author is to be congratulated on a paper which presses home a lesson which is much needed in some quarters—that mathematics is but one of several useful tools which, by providing a form of mental shorthand, enable the mind to grasp a much larger selection of natural relationships than would otherwise lie within its power. Any effort to answer those who have come to worship it as some new and omnipotent deity capable of solving all problems in human life, and worthy of unquestioning awe and subservience, cannot but fulfil a useful purpose.

Perhaps the weakest point in the author's treatment, in which he lays himself open to question from the mathematician, is in his treatment of the relations between observation and calculation. Although not stated categorically, it is everywhere implied that " observation " has an element of " absolute verity " which calculation lacks. Compare his words : " But the final test of truth did not come till step (4), and was furnished by observation ". Frequent quotation is made from Miss Dorothy Emmet's masterly work, *The Nature of Metaphysical Thinking*, yet the main lesson so consistently pressed home in that work is not very clearly brought out here—the lesson that what we frequently define as " truth " is but the symbolism of our mind in correlating our " percepts," and in relation to the absolute is every whit as much a " concept " as a mathematical function ; this point is also developed very ably by Karl Pearson in *The Grammar of Science*. St. Paul's warning that " The things which are seen are temporal ; but the things which are not seen are eternal " (2 Cor., iv, 18) is worth bearing in mind as an example of guidance by divine truth in an age of " Scientific Ignorance " which is still found unimpeachable before 20th Century Metaphysics.

The discovery of " Neptune " was an excellent example to quote when defining the inter-relation between observation and calculation, but the very real utility of mathematics, and its appreciable assistance without which many fundamental advances would have been impossible, seem to have been minimised in the attack which is made on Eddington's epistemological treatment of physics. It is possible that this slight injustice arises from the fact that quotation is drawn entirely from a " popular exposition " by that author, and his more serious works (although one of them is mentioned) are not cited.

Mathematics contain a symbolism without the use of which many of the more intricate physical relationships cannot be expressed *rigorously* and it follows that a popular exposition must lay itself open to detailed attack by a mathematician. A very good case may be made for the effort to explain these matters as well as possible to the layman, but when mathematics, as used by one of this country's leading mathematicians, is being criticised, it is surely fair to cite his *mathematical* works. In one place, for example, the author complains " that the process of deduction is embarrassingly over-productive of symbolic worlds so that selection has to come into play." If reference had been made to *The Mathematical Theory of Relativity* (development pp. 213–226, discussion pp. 226–228), the author would have found this matter dealt with quite frankly, and although only a selection of terms from the general tensor is chosen because they behave in accordance with *all* our percepts, it is pointed out that this is equivalent to saying that our five senses are only cognizant of phenomena which may be described by such a limited system. I feel certain that the author is fully persuaded that very many entities are existent in the universe, and form a spiritual world of which our senses are not cognizant. Had Eddington not found any excess terms in his general expression it would have been a legitimate criticism that he could not possibly be correct, having only described a portion of our ambient ; that he has found too many for our perceptual experience does not prove that he has necessarily found a correct universal system (for such matters do not form the subject of a possible physical experiment), but since a correct tensor (if such exists) must essentially contain extra terms, it is unfair to criticise him on this count.

Again, the empirical method behind the amazing developments of Quantum Mechanics is eulogised. This development was analogous to the observations of Uranus which gave birth to the calculations of Neptune's orbit which later enabled it to be discovered. In complement to this, it is suggested that Eddington's posthumous work *Fundamental Theory* presents a mathematical analysis of the relationship between Relativity and Quantum Physics which will point the way to many new advances by the experimental physicist. The failure to acknowledge the very real assistance which Quantum Physics can derive from such analysis is a weakness in the present paper.

D.

The subject of " time " is a very difficult and debatable matter and many writers have certainly been guilty (as the author says) of woolly thinking when they have failed to discriminate between physical time and the biological entity. The author is wrong, however, in implying that leading mathematicians claim any " absolute verity " for the curvature of space : in fact, Eddington, in *Fundamental Theory* shows that " space curvature " and " quantum uncertainty " are but two methods of taking into account the same phenomenon when calculating results, and implies that neither has any absolute significance (see also *Mathematical Theory of Relativity*, p. 197). The author is also guilty of an over-simplification when (on p. 22) he suggests that dimensional time encourages a rejection of causation. The doctrine of causation has probably done more in the last five centuries to undermine the fundamentals of " divinity " than any other weapon of the rationalist. It is surely one of the most hopeful signs of our age that we are beginning to realise that our normal use of causation is nothing more than the specification of sequence (*i.e.*, the description of distribution in time), and that when we seek for a " cause " in the absolute sense we only come to rest in " personality." The inner necessity which is felt by so many, of the need for a mechanical " causality " to explain experience rests primarily on the recognition of many phenomena outside of our discrete personality, and independent of other human personalities by which we are surrounded. When once we have recognised the existence of God as a " super-personality," all problems associated with the nebulous clash between miracle and natural law vanish ; the so-called law of cause-and-effect becomes a specification of sequence, with the divine personality as supreme and efficient cause, and certain local " perturbations " of this continuous field which we call human personalities. It is suggested that our modern blindness to this fundamental, and our persistence in thinking of the universe as only a machine was foreseen by St.Paul when he spoke of the last days when men should have " a form of Godliness," while they denied the power thereof (2 Tim., iii, 5).

Author's Reply.

Pressure on space demands that my replies to contributors to the discussion should be summary.

Brigadier N. M. McLeod provides an opportune illustration of the tendency to ignore or minimize experimental results. I thank him and Mr. L. D. Ford for their appreciative remarks. I fear that the answers to Mr. Ford's two questions must both be, yes. But I rejoice with him that God has, altogether gloriously, revealed Himself in Christ, in total independence of science or mathematics.

Several of my critics failed to read my paper with sufficient care. I nowhere criticized Eddington's mathematics, which has my unqualified admiration. It was his pan-mathematical scheme of science and his philosophy of the universe constructed thereon to which I objected. To have quoted from his more serious mathematical works would have been too technical for the VICTORIA INSTITUTE. Moreover, it was unnecessary, since Eddington was equally frank about the "excess terms" in the more popularly expressed extracts I actually cited. If Mr. Lovelock implied that the extra terms of the general tensor can in any way represent the entities of "a spiritual world of which our senses are not cognizant" I reject the idea as a daydream. We might equally well claim that the roots of quadratic equations which are inapplicable as solutions of particular concrete problems stand for spiritual entities beyond our ken. Surely we must distinguish between mental abstractions and spiritual realities. As to the indebtedness of both Relativity and Quantum Theory, as also their interrelations, to mathematics, why should I have stressed it ? I incline to the suspicion that Relativity, Quantum Theory and "Fundamental Theory" have, all three, lost themselves in a mathematical maze—and that due to the homonymic treatment of time and dimensions to which Thompson so well directs attention (see citations).

I cannot agree that when the super-personality of God *plus* human personality has been allowed for there is nothing more left of causation than "distribution in time." See Thompson, *Sci. and Common Sense*, pp. 101–103, and also Stebbing, *Mod. Intro. Logic*, ch. xv, xvii and xviii. Causation is an intelligible concept necessary to and still used by science in spite of the evaporative influence of mathematics.

To Mr. Siddans I must point out (i) that the "rather dim view of the attitude of the pure mathematician" was due to the necessity of dealing with what mathematics *is* in its essential nature, rather than

with its better-known activities and applications. (ii) I nowhere used the phrase " final truth " ; I did write of experiment as the final *test* of truth in the examination of a physical theory. To this I adhere. (iii) By " real space " I mean the space of experience and of experiment as when considering the volume of a flask, the expansion of an iron rail or the distance of Sirius. And surely, to leave it an open question which geometry corresponds to real space is merely to leave the decision to experiment and observation—consistently enough. (iv) To ask that duration be treated in the same way as length " without worrying if the experiment can be actually performed " is a sheer begging of the whole important question of what is the intrinsic nature of time and a source of serious error in philosophy if not in mathematics. Incidentally, the " experiment " of equating units of length *can* be (directly) performed. (v) Christianity cannot be got out of mathematics. I urge Mr. Siddans as a teacher to be wholeheartedly sincere, and to teach his mathematics with pointed regard to the distinction between primary assumptions and deduced results and with due recognition of its limitations as an organon of knowledge. Thus, he may inculcate habits of intellectual honesty and love of what is sincere and true. He can hardly do more. Christianity is a revelation, not a discovery.

It is really false for Mr. Lovelock to say that in my paper, " although not stated categorically, it is everywhere implied, that observation has an element of ' absolute verity ' which calculation lacks." I avoided with extreme care and, I believe, consistency, all reference to " absolute verity " or such ideas. It should have been clear enough to every reader from the mere context of the words " the final test of truth," that they referred to the finality only of the process of establishing (or refuting) any working hypothesis of science. I eschewed all approach to metaphysics. I nowhere referred to the " absolute " or even to the " real " except, in the latter case, with the simple meaning " belonging to every-day experience " or " subject to actual observation and experiment." For similar reasons, although pleased to quote (but twice only, not " frequently," as alleged) from Miss Dorothy Emmet's brilliant book, I did not feel called upon to summarize its " main lesson." For to say that " what we often define as ' truth ' is but the symbolism of our minds in correlating our percepts, and in relation to

the absolute is every whit as much a ' concept ' as a mathematical function " may or may not be profound truth, but (although endorsed by Karl Pearson—an old teacher of mine), it makes not the least difference to the relationship of mathematics to experiment on the one hand or to spiritual realities on the other. The former, Mr. Lovelock admits, I correctly illustrated. Does he claim, with respect to the latter (spiritual realities) that they are to be equated to mathematical concepts, which he, with Eddington, *seems* to place on a higher spiritual level than non-mathematical ? I submit that the " unseen things " of 2 Cor. iv, 18, are spiritual entities of an order outside of and unapproachable by mathematics however refined, and known only by revelation and the work of the Spirit of God in regenerated minds (1 Cor. i, 20 ; ii, 14, etc.).

If it is true that leading mathematicians claim no " absolute verity " for space curvature, it *is* true that they claim " physical reality " for it. If not, why do they take such pains to enable us to imagine it in our minds ? Eddington says it is a " picture " but not an " hypothesis " (*Nature of Phys. W.*, p. 157). A picture of what ? And Castelnuovo says (*Scientia*, Vol. XXXIII, pp. 169–180) it must be regarded as an object of sensory perception and not merely as a useful concept. I submit again that " curvature of space " is an unscientific term since in its reference it is anything but unique, unambiguous or precise. It is an attempt—a pretence—to " translate the untranslatable."

Mr. Leslie asks me to say plainly whether I accept the Special and General Theories of Relativity. I answer that I accept them as mathematical formulations giving certain values agreeing with experimental results. This does not give them status as sound physical theories. Every mathematician knows that his equations may " work " without even symbolising real physical truth.

I did not leave commonsense undefined. Mr. Leslie, however, wishes on to me what amounts to his own definition of it—a definition by enumeration of ingredients which I cannot wholly accept. In any case, the general methodology of commonsense, as shewn in my paper, is that of science. But, over the latter, *as a test*, commonsense has the very distinct advantage of having its feet firmly planted on the ground of experience common to all. It is a watch-dog we should encourage.

Mr. Leslie has quite misread my remarks on time. Of course, time can be put into equations and so mathematical physics is not in danger of being "swept away." What must, however, be recognised if we are to think fundamentally and so with philosophic soundness, is that it does not enter such equations of its own right, but indirectly by virtue of its correlate, viz., space (whether space traversed by the hand of a wrist-watch or by that of Big Ben, of course makes no difference!). It may be treated, mathematically, as if it were another dimension. That does not make it one, nor does the numerical truth or correspondence to metrical facts of the equations in which it is so treated establish the physical truth of its assumed dimensionality or the reality of space-time curvature.

Mr. Grant's comments seem to be quite irrelevant. His definition of mathematics as the science of ideas is completely inadequate. It would not differentiate mathematics from any other branch of knowledge—not even from Herbartian psychology. To say that one equals one is by no means the same thing as to say that one egg equals one egg. The former, by the laws of thought, is necessarily true. The latter is not. Yet Mr. Grant doubts the former and asserts the latter.

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THE TEXTUAL BACKGROUND OF THE USE OF THE OLD TESTAMENT BY THE NEW.

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THERE are in the New Testament rather over 1,020 direct quotations or verbal allusions to the Old. Allusion of thought apart from words is, of course, not included in this computation. If it were, there would be little of the New Testament with which we should not have to deal. The exact number of allusions is difficult to ascertain because in the case of those which consist of no more than one or two words the intention of the writers to make a verbal allusion or not is sometimes a matter of judgment. I have counted 1,025. Of these approximate 1,025 the Johannine Epistles and Philemon have none at all, while the Apocalypse has about 331. Next to this the largest number for any book in proportion to its size (not absolutely) is shown by the Epistle to the Hebrews, which has about 93, and similarly the lowest number in proportion is found in the Gospel of John, which has only about 17.

A substantial majority of these quotations and allusions is taken from the LXX. It is the normal source from which quotations are drawn. At the very least six out of every seven quotations are derived from it. The proportion is probably considerably higher, because in making the calculations I have reckoned as Non-Septuagint all on which reasonable doubt can be thrown, and some of these are likely to have been wrongly excluded. If we group the books into sections, the proportion of LXX quotations differs considerably. Thus in the Gospels the proportion of Non-Septuagint allusions is between a quarter and a third and in Matthew it is about three-sevenths. In Acts at least nineteen out of every twenty quotations come from the LXX. In the Catholic Epistles the proportion is about four-fifths. In the Pauline Epistles, excluding the Pastorals, at least nine-tenths comes from the LXX, in Hebrews at least eleven out of every twelve. In the Pastorals there are only eight quotations altogether and all are from the LXX. Finally

in the case of the Apocalypse, where for reasons to be mentioned later the proportion is difficult to ascertain, I have reckoned the LXX allusions to amount to about six in every seven. Now these are precisely the results we should expect having regard to the background of the writers and to the needs of the persons for whom their books were primarily written or to whom their epistles were addressed. The writers with a Palestinian background show the highest proportion of quotations from sources extraneous to the LXX, while Acts, Paul and Hebrews show the lowest. Luke's Gospel is in a special category, the high proportion of Non-Septuagint quotations being almost entirely concentrated in the first two chapters, while the Apocalypse holds the balance. Its proportion of LXX allusions is about six in seven, identical with that of the whole New Testament.

There being no doubt that the majority of quotations were taken from the LXX, our first question must be: how were these quotations taken? Were they copied from an open Bible? It seems quite obvious that they were not, and in fact reflection upon the different circumstances with regard to quotation which obtained in the ancient world would not lead us to suppose that they were. There were no printed Bibles and no reference margins. There were no chapters and verses, though there may have been some sort of sectional arrangement. References were difficult to find except to those who had a particularly familiar knowledge of a given book. On the other hand memories were probably then rather keener. It is true that a minority of quotations appears word for word, the proportion varying from about a third in the Gospels and Hebrews to about a fifth in Acts and the Apocalypse, but a large percentage of the verbatim quotations are extremely short and were they not word for word could scarcely be recognised as quotations at all. The majority of quotations are made perfectly recognisably but with varying degrees of inaccuracy. This clearly means that as a general rule the New Testament writers relied on their memories in making quotations. This would account for the majority of inaccurate quotations as well as for the minority of accurate ones. It does not seem possible to classify the verbatim quotations in any way except that in some of the New Testament writers at any rate quotations from the Psalms possibly have a tendency to be rendered more accurately than others. This fact is quite consistent with reliance upon memory. What mattered to the apostles was not so much the

exact words of Scripture as the meaning which lay behind the words. Though reliance upon memory was the general rule, there are some cases, as we shall see later, where quotations must have been taken from written texts, either other New Testament writers or sources on which more than one writer drew.

Before we pass on to consider the various ways in which such quotations as are not word for word were modified there is one point which should be stated. There is no evidence that New Testament writers modified the LXX in order to make their quotation conform more exactly to the original. There are plenty of quotations from extra-LXX sources, as we have noticed, and these will be dealt with later, but when writers quoted from the LXX, as they usually did, they quoted from it whether or not it was in agreement with the Hebrew. Disagreement between the LXX and the Hebrew of the Massoretic text might arise from two causes. The LXX might rest upon a different original Hebrew text or misinterpretation of the original text, or the translation might be an incorrect, inaccurate or weak rendering of the original. There are at least half-a-dozen quotations from the LXX in which the LXX is in marked disagreement with the Hebrew as we have it. Examples are the long quotation from Amos ix, 11, 12 in Acts xv, 16-18, the quotation in I Pet. ii, 9 of the additions by the LXX to the Massoretic text in Exod. xxiii, 22, and the four well-known cases in the Epistle to the Hebrews, the quotation of Num. xxiv, 6, in Heb. viii, 2, of Jer. xxxi, 31-34 in Heb. viii, 8-12, of Ps. xl, 6-8 in Heb. x, 5-7 and of Gen. xlvii, 31 in Heb. xi, 21. There are numerous cases of quotation from the LXX of passages which are at best rough and inadequate renderings of the Hebrew. Their number is of course a matter of judgment, but they constitute an appreciable minority of all the LXX quotations and are quite sufficient to show that no New Testament writer selected for quotation from the LXX only such passages as were an accurate or proper rendering of the original Hebrew. Questions of text as between LXX and Hebrew or of the accuracy of the Greek version clearly never entered the heads of the New Testament writers.

We are next to ask how the New Testament writers treated textually the passages which they selected for quotation. First of all modification arose owing to inaccuracy of memory. Inaccuracies extended to words of major importance in the sentence as well as appearing in small differences such as the substitution

of a pronoun for a substantive or of one preposition for another of similar meaning. Examples are Matt. vii, 23 *ἀποχωρεῖτε ἀπ ἐμοῦ οἱ ἐργαζόμενοι τὴν ἀνομίαν*, where the original, Ps. vi, 8 has *Ἀπόστητε*; I Cor. i, 19 *καὶ τὴν σύνεσιν τῶν συνετῶν ἀθετήσω* where the original Is. xxix, 14, has *κρύψω*. The Pauline rendering may be a reminiscence of the *μεταθήσω* of the previous sentence in Isaiah. Again Heb. ii, 12 *Ἀπαγγελῶ τὸ ὄνομά σου τοῖς ἀδελφοῖς μου*, where the original Ps. xxii, 22 has *διηγήσομαι*. Major differences of this sort seem to be less frequent in Acts and Paul than in the Gospels, Hebrews or the Apocalypse, though they occur everywhere. At least one such difference seems to be intentional. This is the Pauline *ἔδωκεν δόματα τοις ἀνθρώποις* (Eph. iv, 8) for *ἔλαβες δόματα ἐν ἀνθρώποις* of Ps. lxviii, 18. Although New Testament writers sometimes apply their quotations in ways which the original Old Testament author might find hard to recognise, they rarely alter the actual words of the quotation in so striking a way. In fact I could not indicate any other passage where it seems to me certain that any one of them has done so. We may conclude this short list of examples by pointing out the interesting fact that wherever the *βίβλος ζώντων* of Ps. lxix, 28 is referred to in the New Testament it is called *βίβλος ζωῆς*. This seems to indicate that the phras was a current expression in apostolic and primitive preaching and teaching. Compare also the alteration by the apostle Paul both in Rom. iii, 20 and Gal. ii, 16 of the *πᾶς ζῶν* of Ps. cxliii, 2 to *πᾶσα σάρξ —οὐ δικαιωθήσεται πᾶσα σάρξ* another instance —possibly quite independent—of dislike of the participle *ζῶν*.

As might be expected, abbreviation of passages in quotation sometimes took place. Under this head I do not include quotations of a few words selected from a longer original clause, but the straightforward abbreviation of a passage which is otherwise quoted as a whole. Omissions may extend from a single word to a whole sentence. They may arise from inaccuracy of memory and so come properly under our first head. Additions of a word or two occasionally occur. But they may also arise from an intentional desire to omit part of a passage as irrelevant or as making the whole too long. Thus in Matt. iv, 6 the last clause of Ps. xci, 11 is omitted in the quotation *Τοῖς ἀγγέλοις αὐτοῦ ἐντελεῖται περὶ σοῦ καὶ ἐπὶ χειρῶν ἀροῦσιν σε*, and I do not think the fact should be attributed to misquotation on the part of the devil into whose mouth the words are put! In

Mark there are no substantial omissions. In the quotation of Hab. i, 5 in Acts xiii, 41 the sentence *καὶ ἐπιβλέψατε* and the neuter plural *θαυμάσια* after *θαυμάσατε* are omitted. The first half of Ps. xxxiv, 18 runs in the LXX *γεύσασθε καὶ ἴδετε ὅτι χρηστὸς ὁ κύριος*. This is quoted in I Pet. ii, 3 *εἰ ἐγεύσασθε ὅτι χρηστὸς ὁ κύριος*. The passage in Gen. xiv, 17-20 about Melchizedek is considerably abbreviated in quotation in Heb. vii, 1, 2. Substantial omissions are rare in Paul and in the nature of the case do not occur in the Apocalypse, where the majority of quotations are only of two or three words or so.

By far the most frequent form of modification of a passage in quotation by a New Testament writer is that of grammatical or syntactical adaptation. The Old Testament passage is fitted into the form of the New Testament sentence. Examples are many, but it is worth our while to have several before us, so that we can see something of the warp and woof of this weaving of the Old Testament into the New. In Mk. viii, 18 the Lord rebukes the dullness of the disciples in words taken from Ezek. xii, 2: *ὀφθαλμοὺς ἔχοντες οὐ βλέπετε, καὶ ὦτα ἔχοντες οὐκ ἀκούετε*; the original runs: *οἳ ἔχουσιν ὀφθαλμοὺς τοῦ βλέπειν, καὶ οὐ βλέπουσι, καὶ ὦτα ἔχουσι τοῦ ἀκούειν, καὶ οὐκ ἀκούουσι*. Thus the person is changed and the form of the sentence turned into an interrogative. In Lev. xviii, 5 the people are told with regard to God's statutes and judgments *ποιήσετε αὐτὰ ἃ ποιήσας ἄνθρωπος ζήσεται ἐν αὐτοῖς*. Quoting this passage the Lord says to the lawyer: *τοῦτο ποίει καὶ ζήσῃ*. The plural imperative and the aorist participle are combined in a singular imperative and the person of the main verb is changed. In describing the future blessedness of Zion the prophet Isaiah declares *καὶ πάντας τοὺς υἱούς σου διδακτοὺς Θεοῦ* (Is. liv, 13). This is quoted by the Lord, *καὶ ἔσονται πάντες διδακτοὶ Θεοῦ* (Jn. vi. 45), the case being altered from accusative to nominative. Moses reminds the people of the Lord's care for them: *καὶ ἐν τῇ ἐρήμῳ ταύτῃ ἣν εἶδετε ὁδὸν ὄρους τοῦ Ἀμορραίου ὡς ἐτροφοφόρησέν σε κύριος ὁ Θεός σου* (Deut. i, 31). The Apostle Paul selects the kernel of this statement, or, it may be, the author of Acts abbreviates his words: *ἐτροφοφόρησεν αὐτοὺς ἐν τῇ ἐρήμῳ* (Acts xiii, 18). The number and person of the pronoun are changed. A good example of this adaptation appears in I Pet. ii, 10: *οἳ ποτε οὐ λαός, νῦν δὲ λαὸς Θεοῦ, οἳ οὐκ ἠλεημένοι, νῦν δὲ ἐλεηθέντες*. This is a skilful combination of Hos. i, 6, 9, ii, 1, 23 and involves a change of gender and number in the perfect participle passive and an additional change of

the participle itself to an aorist. The Psalmist says that he will run—or, as the LXX has it, ran—in the way of God's commandments, *ὅταν ἐπλάτυνας τὴν καρδίαν μου* (Ps. cxix, 32). The apostle writing to the Corinthians says (II Cor. vi, 11) *ἡ καρδία ἡμῶν πεπλάτυνται.* This involves the change of the case of a substantive from accusative to nominative, the change of number in the pronoun and the change of voice, tense and person in the verb. *Ἰσραήλ*, says Isaiah (xlv, 17), *σώζεται ὑπὸ κυρίου σωτηρίαν αἰώνιον.* The author of Hebrews takes this wonderful expression up, but he alters the case. Christ, he says, is *αἴτιος σωτηρίας αἰωνίου* (Heb. v, 9). I have multiplied examples in order to try to give some impression of what is the main method of allusion to the Old Testament made use of by the New Testament writers. Direct quotation of long passages has its place, a large place, but more powerful still is the cumulative effect of this constant weaving of the Old Testament into the structure of the New. It emphasises the unity of the two Testaments as parts of a single whole, it demonstrates the perfection of the *preparatio evangelica*, and it illustrates the importance of the part played in the Providence of God by the great Alexandrine version in preparing men's minds for the Christian revelation.

Another well-known method made use of by the New Testament writers to reinforce their teaching by reference to the Old Testament is the syncretism or conflation of two or more passages into a single quotation. This is occasionally effected without verbal alteration, but more often with more or less adaptation of the kind we have already noticed, this being sometimes necessary in the nature of the case. Thus in the course of the Magnificat we have *ἀντελάβετο Ἰσραὴλ παιδὸς αὐτοῦ μνησθῆναι ἐλέους.* This is a combination of Is. xli, 8 *Σὺ δὲ Ἰσραὴλ παῖς μου* and Ps. xcviii, 3 *ἐμνήσθη τοῦ ἐλέους αὐτοῦ τῷ Ἰακώβ.* In his sermon in the synagogue at Pisidian Antioch the apostle Paul speaks of the death of David. He says: *Δαυεὶδ . . . ἐκοιμήθη καὶ προσετέθη πρὸς τοὺς πατέρας αὐτοῦ* (Acts xiii, 36). This is a combination of I Kings ii, 10 *καὶ ἐκοιμήθη Δαυεὶδ μετὰ τῶν πατέρων αὐτοῦ* and Jud. ii, 10 *πᾶσα ἡ γενεὰ ἐκείνη προσετέθη πρὸς τοὺς πατέρας αὐτῶν.* In I Pet. ii, 9 the apostle applies several Old Testament expressions to the Christian church. He says *ὑμεῖς δὲ γένος ἐκλεκτὸν, βασίλειον ἱεράτευμα, ἔθνος ἅγιον, λαὸς εἰς περιποίησιν ὅπως τὰς ἀρετὰς ἐξαγγείλητε τοῦ ἐκ σκότους ὑμᾶς καλέσαντος.* This is a combination of Ex. xxiii, 22 with Is. xliii, 20. In the former we read *ἔσεσθέ μοι λαὸς περιούσιος ἀπὸ*

πάντων τῶν ἐθνῶν . . . ὑμεῖς δὲ ἔσεσθέ μοι βασίλειον ἱεράτευμα καὶ ἔθνος ἅγιον, in the latter τὸ γένος μου το ἐκλεκτὸν λαόν μου ὃν περιεποιησάμην τὰς ἀρετάς μου διηγεῖσθαι. Notice incidentally the change of LXX διηγεῖσθαι to ἐξαγγεῖλαι similar to the change in Heb. ii, 12 of διηγήσομαι in Ps. xxii, 22 to ἀπαγγελῶ. In Paul there is very little of this combination of passages. We get it in Rom. ix-xi—a passage which, as we shall see later, is peculiar on other grounds—twice in II Cor. vi, once in Eph. vi, two or three times in the Thessalonian epistles and once in Titus. In Hebrews also it is infrequent, but there are a few interesting cases. The Apocalypse, that museum of rough Old Testament allusions, is of course full of it, but the treatment of the Old Testament in the Apocalypse, as we shall see, is different from its treatment in other New Testament books.

Those passages in which quotations from the LXX are combined with quotations from another source are best treated later when we come to deal with non-LXX quotations.

Before we pass on to discover what light is thrown upon methods of quotation by passages which are quoted by more than one writer, there are a few quotations of special interest which might claim our attention for a few moments. We have already noticed the quotation of Ps. xci, 11, 12 in Matt. iv, 6. The uniqueness of this quotation lies in the fact that the words are put into the mouth of the devil who quotes word for word from the LXX except for the omission of a clause! It is noteworthy that both in Matthew and Luke all quotations in the temptation narrative, the three from Deuteronomy and the present one, are word for word from the LXX. Was this due in the first instance to the evangelist Matthew, who seems at an early stage to have been concerned with the correspondence between Old Testament prophecy and witness and the Gospel fulfilment? Among the many Old Testament extracts in Stephen's speech recorded in Acts vii there are three of special interest. In each of them the quotation is correct and perfectly recognisable, but the original reference of the words is different from the application made of them by the speaker. Thus in verse 7 he adds to the words of God to Abraham quoted from Gen. xv, 13, 14 the sentence καὶ λατρεύσουσίν μοι ἐν τῷ τόπῳ τούτῳ, which is taken from Ex. iii, 12 and was originally spoken to Moses. In verse 15 he is describing the death of *Jacob*. καὶ ἐτελεύτησεν, he says, καὶ οἱ πατέρες ἡμῶν. But this is an echo of Ex. i, 6, where the words refer to Joseph, not to

Jacob. Thirdly, there is the well-known passage in verse 16 in which the speaker combines in a single quotation words from Gen. xxxiii, 19, l, 13 and Josh. xxiv, 22 in a strange version which has the added peculiarity—in Stephen's speech of all places—of appearing to reflect the Hebrew and not the LXX. Here he tells us that the patriarchs were buried in a tomb which Abraham bought from the sons of Hamor in Shechem, whereas the purchase was really made by Jacob. Now do not these three references reflect exactly the condition of mind of a man thoroughly acquainted with the Old Testament making an *extempore* speech under conditions of stress and excitement? No such phenomenon occurs elsewhere in the case of any other quotation throughout the New Testament outside the course of this speech. They are frankly slips. But if they are, what an accurate record we must possess of this speech, whether the author of Acts verified the references or not. If he did, he may have been under some temptation to correct them, but did not do so. If he did not verify them, we may be equally assured that he has passed on the summary of the speech as he received it.

It is now time to examine some passages that are quoted by more than one writer. We will begin with the synoptists, a special case, because the double or triple quotations are not entirely independent. In Mark's Gospel there are at least thirty-nine quotations from the LXX. Of these thirty-five all but four occur in parallel passages in Matthew. Of the thirty-five so occurring nineteen are identical. About two-thirds of the nineteen are word for word from the LXX. Of the remainder there are two or three from the Little Apocalypse, δεῖξον τῷ ἱερεῖ in Mk. i, 44, the abbreviation of the law against cursing parents, the statement in Gethsemane Περίλυπος ἡ ψυχή μου and the quotation from Ps. xxii κινοῦντες τὰς κεφαλάς. The identical quotations are scattered over both Gospels, but seem most prominent in the Little Apocalypse. This perhaps strengthens the view that that passage was in circulation in written form before the composition of the earliest Gospel. There are three cases where the parallel quotation in Matthew appears to be taken from an extra-LXX source, and incidentally one in which a combination of passages in the Little Apocalypse appears in Mark wholly from the LXX and in Matthew partially in another version. There remain thirteen cases where the parallel quotations occur with different wording in Matthew

and Mark. If we ignore the omission by Matthew of the pronoun σου in the two quotations of the fifth commandment, both of which, except for this detail, which is complicated by variant readings, are identical in both Gospels, we find that Matthew—not Mark—regularly follows the LXX more closely in these parallel cases. Of these parallel quotations twenty are represented also in Luke. Exactly half of these are identical in Mark and Luke, but they are not quite the same as those identical in Mark and Matthew. One is represented in Luke probably from a non-LXX source. Nine are different in Mark and Luke and Mark is regularly closer to the LXX. Thus we have Matthew closest of all, then Mark and lastly Luke. Now it is indisputable that Luke drew upon Mark, and we find the source closer to the original LXX than the abstract. Is the same thing true in the case of Matthew and Mark? If we may consider such a deduction—I do not press it, I leave it open—then Abbot Chapman's view of the priority of Matthew will turn out correct. In the case of quotations which do not occur in Mark but are common to Matthew and Luke most seem to be identical. An exception is the quotation of Mic. vii, 6 where they are very different and Luke is nearer to the LXX.

Here are some further passages which are either outside of the synoptists altogether or are not confined to them. Gen. ii, 24 is quoted identically in Matt. xix, 5 and Mk. x, 7 with the omission of the pronoun αὐτοῦ. It is quoted again in Eph. v, 31, but the apostle Paul changes the preposition ἕνεκεν to ἀντί. The evangelists are more accurate. Did they have a written source? Or are we to attribute this to the accurate mind of *Matthew?* Gen. xxi, 12, ἐν Ἰσαὰκ κληθήσεταί σοι σπέρμα is quoted verbatim in Rom. ix, 7 and Heb. xi, 18. There is of course no need to suppose that the one took from the other. The LXX itself is the common source. The writer of Hebrews had an especially accurate memory. Ex. iii, 6 is quoted in five passages in four different ways. The original runs Ἐγώ εἰμι ὁ Θεὸς τοῦ πατρός σου, Θεὸς Ἀβραὰμ καὶ Θεὸς Ἰσαὰκ καὶ Θεὸς Ἰακώβ. Quotations occur in Matt. xxii, 32, Mk. xii, 26, Lk. xx, 37, Acts iii, 13, vii, 32. Matthew adds, Mark abbreviates, Luke adapts and abbreviates. Mark is closest to the LXX—exceptionally. The two quotations in Acts, though they differ in the order of the words, change τοῦ πατρός to the plural τῶν πατέρων. As one quotation is in a sermon of Peter's and the other in Stephen's speech, it is likely that the hand of the author is to be seen in this version of the LXX passage.

An alternative, which seems to me less likely, is that the phrase was a common one in the plural in apostolic preaching. Ex. xix, 6 *ὑμεῖς δὲ ἔσεσθέ μοι βασίλειον ἱεράτευμα καὶ ἔθνος ἅγιον* is quoted in I Pet. ii, 9 and twice in the Apocalypse, i, 6 and v, 10. The Petrine passage, as we should expect, is the most accurate. The Apocalypse has *βασιλείαν καὶ ἱερεῖς τῷ Θεῷ* and *τῷ Θεῷ βασιλείαν καὶ ἱερεῖς*. The statement about creation from the fourth commandment (Ex. xx, 11) is quoted in Acts xiv, 15 and Rev. x, 6 where it is inextricably mixed up with other passages. The quotation in Acts is not verbatim but accurate.

The quotations of the sixth to tenth commandments exhibit an interesting cleavage. The Old Testament, both Exodus and Deuteronomy, has the form *οὐ* with the future indicative. This is followed by Matthew in his three citations of one or more of the commandments and by the Apostle Paul in Rom. vii, 7 and xiii, 9. Mark on the other hand has the form *μή* with the aorist subjunctive and he is followed by Luke, while the same form occurs in Jas. ii, 11. If this form was a separate version of the Hebrew, we can understand its use by James, but why does Mark use it? He was an inhabitant, if not native, of Jerusalem. Did he take it from James? And is this an indication of the early date of James' epistle? The fifth commandment is always quoted accurately, twice by Matthew, twice by Mark, once by Luke and once in Ephesians, except for the omission or addition of the pronoun *σου* made uncertain by variant readings in most cases. Ex. xxiv, 8 *τὸ αἷμα τῆς διαθήκης* is quoted accurately by Matthew and Mark with the addition of *μου* and in Hebrews (x, 29), but Luke alters to *ἡ καινὴ διαθήκη ἐν τῷ αἵματί μου* following Paul in I Cor. xi, 25, though he again does not slavishly copy—Paul says *ἐν τῷ ἐμῷ αἵματι*. There is probably in this version a reminiscence of Zech. ix, 11. Towards the close of Stephen's speech (Acts vii, 44) we find a rough quotation of Ex. xxv, 40. The speaker is dependent upon memory and cites the substance of the passage. It is quoted more accurately in Heb. viii, 5, *ὅρα ποιήσεις πάντα κατὰ τὸν τύπον τον δειχθέντα σοι ἐν τῷ ὄρει*. The writer inserts *πάντα* according to the reading of Codex Ambrosianus and changes the perfect participle to the aorist.

Interesting questions arise from the various citations in the Gospels of the first and great commandment from Deut. vi, 4, 5. This is old ground of course, but perhaps it is worth detailed

examination. Deuteronomy has ἐξ ὅλης τῆς διανοίας σου καὶ ἐξ ὅλης τῆς ψυχῆς σου καὶ ἐξ ὅλης τῆς δυνάμεως σου. For διανοίας codices Alexandrinus and Ambrosianus, the readings of the former of which are generally, though not always, followed in New Testament quotations, read καρδία. Matthew has ἐν ὅλῃ τῇ καρδίᾳ σου καὶ ἐν ὅλῃ τῇ ψυχῇ σου καὶ ἐν ὅλῃ τῇ διανοίᾳ σου Mark has ἐξ ὅλης τῆς καρδίας σου καὶ ἐξ ὅλης τῆς ψυχῆς σου καὶ ἐξ ὅλης τῆς διανοίας σου καὶ ἐξ ὅλης τῆς ἰσχύος σου. Matthew is independent in changing the preposition. Otherwise he follows Mark with the omission of ἰσχύς, which he would not find in, or remember from, the LXX and therefore may have thought to be outside the quotation. Mark's second quotation (xii, 33), which immediately follows the first, makes confusion worse confounded. He alters διανοίας to συνέσεως. The Textus Receptus would add ψυχῆς in the third instead of, as previously, the second place, but the better texts omit it altogether. In the case of Luke's quotation (x, 27) we cannot be certain about the preposition. All texts read ἐξ ὅλης τῆς καρδίας σου. The critical texts read ἐν in the following three instances, and in this case Luke is partially following Matthew. The Received Text reads ἐξ in all four cases, which is possibly the more likely reading. The order of the nouns in Luke is καρδία, ψυχή, ἰσχύς, διάνοια. In vocabulary he follows Mark but changes the order. The introduction of ἰσχύς into the passage by the evangelists goes behind the LXX to the original Hebrew or perhaps rests on the Aramaic in which the Lord originally spoke. The change by Mark within two verses of διάνοια to σύνεσις shows that there was no set Christian formula to express this great commandment. It appears that attempts were made in a variety of forms to express its substance, perhaps owing to its supreme importance. Whence do both καρδία and διάνοια occur in the evangelists' forms of the quotation? Were both readings of the LXX known to them? Was the one word already a gloss upon the other? Or do both words go back, as is perhaps the more reasonable view, to the Lord's original utterance in Aramaic? If they do, it seems that it was not Matthew who in this instance took contemporary notes of what was said. Perhaps we owe the Marcan and Lucan forms to the Apostle Peter's memory. The quotation of Deut. xviii, 15, Προφήτην ἐκ τῶν ἀδελφῶν σου ὡς ἐμὲ ἀναστήσει κύριος ὁ Θεός σου σοί in Acts iii, 22 and vii, 37 provides another example of a quotation both in a sermon of Peter's and in

Stephen's speech which is identical in both instances but differs from the Old Testament. The form must be due to the author of Acts. The variety of the quotation of Deut. xix, 15 is of peculiar interest. The original reads *ἐπὶ στόματος δύο μαρτύρων καὶ ἐπὶ στόματος τριῶν μαρτύρων στήσεται πᾶν ῥῆμα.* It is quoted in this form with the natural omission of the second *ἐπὶ στόματος* and the second *μαρτύρων* by the Apostle Paul in II Cor. xiii, 1. In the quotation in Matt. xviii, 16 the conjunction *καί* is changed to *ἤ*. It is in this same form with *ἤ* that the quotation is made in I Tim. v, 19, which thus follows Matthew, not II Corinthians. Personally I should not draw from this fact the rash conclusion that the Pastoral Epistles were not Pauline, but rather perhaps that the first Gospel complete, or a written document from which some of its non-Marcan portions were drawn, had come to the apostle's notice between the writing of II Corinthians and that of I Timothy. Our next quotation seems, however,to indicate that the Pastorals stand to a certain extent by themselves and separate from the bulk of the Pauline writings. In Deut. xxv, 4 the LXX has *Οὐ φιμώσεις βοῦν ἀλοῶντα.* This appears in I Cor. ix, 9, in the critical texts, which we may judge with reasonable certainty to be right, as *Οὐ κημώσεις βοῦν ἀλοῶντα.* The quotation in I Tim. v, 18 restores the LXX vocabulary but—perhaps only for emphasis—alters the order *βοῦν ἀλοῶντα οὐ φιμώσεις.*

A surprising case is found in the quotation of II Kings i, 10, 12, *κατέβη πῦρ ἐκ τοῦ οὐρανοῦ καὶ κατέφαγεν αὐτόν.* Here Luke (ix, 54) quotes from apparently an extra-LXX source, but the Apocalypse (xi, 5, xx, 9) is closer to the LXX. The quotations of Is. vi, 9, 10 in the Gospels have often been discussed. In Matt. xiii, 14, 15 the passage is quoted at length and verbatim with the omission of the genitive pronoun *αὐτῶν.* This version is followed in Acts xxviii, 26, 27 with the addition of an introductory clause not accurately quoted and like Matthew with the omission of *αὐτῶν.* This means either that Acts scrupulously followed Matthew, or that an *αὐτῶν* has been added in every text of the original which we now possess. The abbreviated and adapted quotation in Mk. iv, 12 is followed in Lk. viii, 10, while finally the fourth Gospel has a strange version of its own (John xii, 40) which is not taken from the LXX. The double quotation of Is. xxviii, 16 is of peculiar interest.

The original LXX text runs: *Ἰδοὺ ἐγὼ ἐμβάλλω εἰς τὰ θεμέλια Σιὼν λίθον πολυτελῆ, ἐκλεκτὸν, ἀκρογωνιαῖον, ἔντιμον, εἰς τὰ θεμέλια αὐτῆς, καὶ ὁ πιστεύων οὐ μὴ καταισχυνθῇ.* This is quoted with omissions in I Pet. ii, 6, and with the alteration of *ἐμβάλλω εἰς* to *τίθημι ἐν*. The same passage is quoted in combination with Is. viii, 14 in Rom. ix, 33 with the identical alteration. This means that one passage is dependent upon the other, or that both are dependent upon a single source. Professor Hort in his commentary on I Pet. argued for the dependence of Peter upon Paul. There are several reasons for rejecting the dependence of Paul upon Peter. Professor Rendel Harris argued for the dependence of both upon a Testimony book. The best solution of the problem perhaps is that of the Dean of Winchester in his recent commentary on I Peter where he argues that both are dependent upon a rhythmical hymn. Is. xl, 3 *Φωνὴ βοῶντος ἐν τῇ ἐρήμῳ*, etc., is quoted identically by all three synoptists with the alteration of the words *τοῦ Θεοῦ ἡμῶν* to *αὐτοῦ*. Luke continues the quotation inaccurately. John i, 23, though quoting from the LXX, is inaccurate, altering *ἑτοιμάσατε* to *εὐθύνατε*. The fourth evangelist had a very inaccurate memory, but he never alters the substance or meaning of his quotations. Is. lxv, 17 uses the words *ὁ οὐρανὸς καινὸς καὶ ἡ γῆ καινή* This is changed to the plural when quoted in II Pet. iii, 13, while the Apocalypse (xxi, 1) keeps the singular but omits the article. A summary of the long passage in Zech. xii, 10, 13, 14 about the tribes mourning when they see the Lord appears twice in the New Testament. In the Matthaean version of the Little Apocalypse (Matt. xxiv, 30) we find *κόψονται πᾶσαι αἱ φυλαὶ τῆς γῆς* and again in Rev. i, 7 *καὶ κόψονται ἐπ αὐτὸν πᾶσαι αἱ φυλαὶ τῆς γῆς*. This is not direct quotation, and therefore one passage is likely to have been influenced by the other. This seems to indicate the dependence of the Book of Revelation upon the Little Apocalypse, or upon Matthew's Gospel.

Ps. xxii, 18 is quoted in all four Gospels in four different ways. The LXX has *διεμερίσαντο τὰ ἱμάτιά μου ἑαυτοῖς, καὶ ἐπὶ τὸν ἱματισμόν μου ἔβαλον κλῆρον*. Matthew has *διεμερίσαντο τὰ ἱμάτια αὐτοῦ βαλλοντες κλῆρον*. Mark has *διαμερίζονται τὰ ἱμάτια αὐτοῦ, βάλλοντες κλῆρον ἐπ'αὐτά*. Of the two Matthew is nearer to the original. Luke has *διαμεριζόμενοι δὲ τὰ ἱμάτια αὐτοῦ ἔβαλον κλήρους*. As usual he is farther from the LXX than Mark, as Mark is than Matthew. John, strange to

say, quotes the LXX word for word. Ps. lxii, 12 *ἀποδώσεις ἑκάστῳ κατὰ τὰ ἔργα αὐτοῦ* is quoted four times in the New Testament. Matthew leaves the LXX and alters *ἔργα* to *πρᾶξιν*. There are two Pauline quotations, Rom. ii, 6 and II Tim. iv, 14 which, though not identical, are substantially the same and follow the LXX. Another version using *δώσω* for *ἀποδώσω* is found in Rev. ii, 23. None of these three seem to be influenced by any of the others. We have already mentioned the *βίβλος ζώντων* of Ps. lxix, 28. It is mentioned seven times in the New Testament. In Phil. iv, 3 it is *βίβλος ζωῆς*. In Rev. iii, 5 and xx, 15 it is *ἡ βίβλος τῆς ζωῆς*. In Rev. xvii, 8, xx, 12 and xxi, 27 it is *τὸ βιβλίον τῆς ζωῆς*. In Rev. xiii, 8 there are variants between the second and third of these forms. The substantial agreement of Paul with the Apocalypse in this rendering seems to indicate that the expression *βίβλος ζωῆς* had become a stock phrase in Christian preaching. Or did it, as Professor Rendel Harris would have advocated, come from a Testimony book? Ps. cx, 1 is the most frequently quoted Old Testament passage of all. It is cited altogether fifteen times, but it appears in at least three different forms. Here is the original: *Εἶπεν ὁ κύριος τῷ κυρίῳ μου κάθου ἐκ δεξιῶν μου ἕως ἂν θῶ τοὺς ἐχθρούς σου ὑποπόδιον τῶν ποδῶν σου*. This is quoted verbatim in Luke xx, 42, 43. It is alluded to in substantially the same form in Matt. xxvi, 64 and Luke xxii, 69, quoted again verbatim in Heb. i, 13 and mainly in the same form in Heb. x, 13. Variant readings in Matt. xxii, 44 and Mark xii, 36 give two further verbatim quotations, though the critical texts read here *ὑποκάτω* for *ὑποπόδιον*. A variant reading also brings Mark xiv, 62 into line with Matt. xxvi, 64 though in the critical texts the order is altered. A fourth form appears in I Cor. xv, 25, where *ὑποπόδιον τῶν ποδῶν* becomes *ὑπὸ τοὺς πόδας*. This is a very natural version. A fifth form in which *ἐν δεξιᾷ* stands for *ἐκ δεξιᾶς* is found in I Pet. iii, 22, Col. iii, 1, Heb. i, 3, viii, 1, x, 13, and Eph. i, 20. Does this *ἐν δεξιᾷ* for *ἐκ δεξιᾶς* arise independently or does its source lie in a characteristic lapse of the Apostle Paul's memory in Col. iii, 1, followed by himself in Ephesians and by Peter and Hebrews? Again was there a current form in a Testimony book *ἐν δεξιᾷ*? The fact that the author of Hebrews uses this form alongside of an accurate quotation perhaps indicates that it rested on something more substantial than an inaccuracy of the Apostle Paul. Alternatively, did the change of preposition pass practically unnoticed? Ps. cxviii,

22, 23, is quoted word for word by Matthew (xxi, 42), Mark (xii, 10) and Luke (xx, 17), verbatim also except for the adaptation of λίθον to λίθος in I Pet. ii, 7. Acts iv, 11 has a different version, close enough to the LXX in the second clause, but substituting for ὃν ἀπεδοκίμασαν οἱ οἰκοδομοῦντες the words ὁ ἐξουθενηθεὶς ὑφ' ὑμῶν τῶν οἰκοδόμων. This demonstrates the dependence of Luke upon Mark when writing his Gospel and his independence when writing Acts. It is noteworthy that the quotation in Acts iv, 11 forms part of a speech of the Apostle Peter's before the Sanhedrin, the authority for which must have been either Peter himself, John, or the Apostle Paul present perhaps as a member of the Council before his conversion. The Apostle Paul is the most likely source, as Luke elsewhere describes a private deliberation of the Council at which no Christian was present. If this is so, we can understand this typically inaccurate Pauline type of quotation.

The quotation of Prov. x, 12 in Jas. v, 20 and II Pet. iv, 8 in a version independent of the LXX accurately representing the Hebrew shows the dependence of Peter upon James. It is noteworthy that the LXX φιλία is rendered by Peter ἀγάπη. The key words δεῖ γενέσθαι from Dan. ii, 28 are rendered verbatim in each synoptic version of the Little Apocalypse and twice in the Book of Revelation (i, 1, iv, 1). The accuracy, even in the case of two words, is so foreign to the Book of Revelation that dependence upon the Little Apocalypse is again indicated. The sevenfold quotation in the New Testament of Dan. vii, 13, 14 is again of interest. The original in the Alexandrine version as represented by the well-known MS from the Chigi Library runs καὶ ἰδοὺ ἐπὶ τῶν νεφελῶν τοῦ οὐρανοῦ ὡς υἱὸς ἀνθρώπου ἤρχετο. This appears in four different forms in the New Testament. Matthew's version is peculiar to him. It occurs twice, in the Little Apocalypse (xxiv, 30) and later (xxvi, 64)—τὸν Υἱὸν τοῦ ἀνθρώπου ἐρχόμενον ἐπὶ τῶν νεφελῶν τοῦ οὐρανοῦ. As usual Matthew is closest of the synoptists to the LXX. No doubt the later quotation is Matthew's version and the passage in the Little Apocalypse is accommodated by him to it. The true Little Apocalypse version no doubt appears in Mark xiii, 26 and Luke xxi, 27 τὸν Υἱὸν τοῦ ἀνθρώπου ἐρχόμενον ἐν νεφέλαις or (Lucan) ἐν νεφέλῃ. The version in Mark xiv, 62 runs τὸν Υἱὸν τοῦ ἀνθρώπου ἐρχόμενον μετὰ τῶν νεφελῶν τοῦ οὐρανοῦ, and no doubt forms the basis for the version of Theodotion, which, as is well known, is the one which appears in the

usual copies and editions of Daniel in the LXX. With this agrees Rev. i, 7, apparently taken from Mark, *Ἰδοὺ ἔρχεται μετὰ τῶν νεφελῶν*. Lastly there is a rough allusion to the passage, in the true style of quotation in the Apocalypse in Rev. xiv, 14.

A very general summary of the results of comparing different versions of the same quotation gives the following results :—

Matthew is chiefly in agreement with Mark and chiefly differs from John.

Mark is chiefly in agreement with Luke and chiefly differs from Paul.

Luke is chiefly in agreement with Mark and chiefly differs from Acts. John is very independent. Acts is the same. James inclines to agree with Peter. Peter sometimes depends on Paul. Paul is very independent. Hebrews chiefly differs from Paul. Revelation is very independent but occasionally agrees with the Synoptists, that is to say, depends to some extent on the Little Apocalypse.

We now finally come to a short study of those quotations which are not taken from the LXX version. The greatest number comes in Matthew, but before we determine the significance of this, we may find it easier to turn further on and deal first with Luke. First of all we must remind ourselves of what we said at the beginning, that there is a certain number of short Old Testament allusions of which it is difficult to say definitely whether the writers took them from the Greek version or not. We had to leave these out of our reckoning when we were dealing with quotations from the LXX. Similarly now we must base our conclusions only upon such passages as can be said with reasonable certainty to be quoted from non-LXX sources. Fortunately the ignoring of the few doubtful cases will make little if any difference to our results. In Luke's Gospel then there are about twenty-three quotations that do not come from the LXX. Of these about sixteen occur in the first two chapters. Now quite apart from any question of quotations it is well known that on grounds of style alone the first two chapters of Luke show themselves to be a narrative based upon a Semitic source. This of course accounts for the difference in the quotations from the LXX version. They are independent translations made by the evangelist when translating his source as a whole out of Aramaic. But this being so, how are we to account for the thirteen or so quotations in the same chapters, three of them

verbatim, which undoubtedly draw upon the LXX? It seems to me that the answer to this question is simple. Imagine yourself translating out of Arabic into English a document which contained several quotations from the Bible without in any way indicating what words were quoted. Some of these quotations you would recognise as you translated them and you would clothe them in the language of the Authorised Version, with certain inaccuracies due to imperfect memory. Other quotations you would not recognise and would translate them into your own English in the course of your rendering of the document as a whole. This is exactly the case with the narrative of Luke i and ii, and it is an important criterion for our dealing with other sections of the New Testament where quotations are mixed. Apart from the sixteen in chapters i and ii there are in Luke at most seven further quotations from non-LXX sources. That in vii, 27 from Mal. iii, 1 he took verbatim from Matthew (unless both took it independently from a "Testimony book", which is unlikely as the whole context occurs in both). One is the quotation in x, 27 from Deut. vi, 5, which we have already dealt with and which perhaps should not come under this section at all. That in xiii, 19 from Ezekiel and Daniel he took with a grammatical adaptation from Matthew, not, by the way, from Mark, who has a different version. The remaining three (x, 19, xvii, 14, xvii, 29) are in a section peculiar to Luke, but they are mere allusions and scarcely constitute a basis for definite conclusions.

Now let us return to Matthew. The Little Apocalypse we must treat by itself. Apart from that section there are at most twenty-two quotations in Matthew which do not come from the LXX. Of these twenty-two six are in sections peculiar to Matthew (ii, 6, 15, 18, xiii, 41, 43, xxvii, 9); seven are quotations with or without a short surrounding context appended to passages which appear in Mark (iv, 15, 16, viii, 17, xii, 18-21, xiii, 35, xvi, 27, xxi, 5, xxvii, 43), Mark having no quotation; one is in a passage also occurring, but without the quotation, in Luke (xi, 29); five are in the Sermon on the Mount and thus peculiar to Matthew; one occurs also in Mark but in a different context (ix, 36); two have been carried over into Luke, one verbatim (xi, 10), and one in a different version (x, 35), neither being in a passage that occurs in Mark. This means that all quotations in sections common to Matthew and Mark derive from the LXX. This common material, then, came from a Greek source, written or oral, be the original Matthew, Mark, or something that preceded

both evangelists. With regard to the Matthaean sections in which we find all the non-LXX quotations mingled, of course, with others taken from the LXX, if we treat these sections separately from the rest of the Gospel, we may choose between two alternatives. The first is that in these sections Matthew took his quotations from a "Testimony book" and inserted them when necessary into his Greek text. The Testimony book was originally compiled in Aramaic. The quotations were either translated by Matthew as he selected them, or were already in a Greek version. The other alternative is that some at least of the special Matthaean sections were translated by the evangelist out of Aramaic or Hebrew. The unity of style throughout the Gospel fits the first alternative better, the occurrence of LXX quotations among the others in the Matthaean sections (notably the first of all, i, 23) fits better with the second. But I think one result emerges in either case. This is that some at least of the Matthaean sections are earlier, perhaps much earlier, than the common sections. To my mind, however, I am bound to confess that a simpler solution strongly suggests itself. The facts of the unity of style throughout the Gospel and the occurrence of LXX quotations among the others instead of militating against each other, as it seems they must do if we regard the Matthaean sections as originally separate from the common material and regard that material as derived by Matthew from Mark, appear to me to harmonise completely if we regard the whole Gospel as a unity, early, Palestinian and originally written in Aramaic and suppose instead that Mark (or Peter) took his material from Matthew. If Mark's Gospel were written in Rome and intended for Gentiles, this would account for his almost exclusive use of the LXX. In that case he took from Matthew only such quotations as he could reconcile with the LXX and omitted the rest. This seems to me to account far more reasonably for the non-appe rance of so many non-LXX Matthaean quotations in Mark's edition of the common material than the view that Matthew added quotations to Mark and that all those added happened to be derived direct from the Hebrew or from some other non-LXX source. By the same criteria the Little Apocalypse emerges as an early document. In the Matthaean version of it there are about eleven quotations from the LXX as opposed to about seven from non-LXX sources. In the Marcan version there are about nine or ten from the LXX and three at most (all rather doubtful) from other sources. At least two

which are non-LXX in Matthew are taken from the LXX in Mark. Luke of course has Hellenised the whole section including all quotations that he uses. Now this seems to me to suggest that Matthew's version of the Little Apocalypse has the earliest features about it, which again seems to work out in favour of Chapman's view of the priority of Matthew.

But the interesting fact is that Mark can use "Testimony books" also. Among several doubtful possibilities there only seem to me to be two quotations in Mark certainly taken from non-LXX sources. These are Mal. iii, 1 in i, 2, peculiar *in this context* to Mark. Yet the quotation is word for word with Matthew's version. The second certainly non-LXX quotation in Mark is that from Joel iii, 13 in iv, 29, in the only short section in the Gospel which is peculiar to it. I do not profess to have an answer to the problem here raised. Can it be that the little section iv, 26-29 is part of a stratum earlier than the common portions which has somehow strayed into Mark? The context seems to make this unlikely. Is it due to the Apostle Peter's recollection? Is it a direct translation from Hebrew or Aramaic? How is it that these two non-LXX quotations in Mark are the quotations which are peculiar to the Gospel?

It will now be convenient to notice a certain phenomenon in the Epistle to the Romans. In spite of four or five instances of quotations in the first Epistle to the Corinthians which appear possibly to be influenced by sources extraneous to the LXX the only certain non-LXX quotations in the whole of the Pauline Epistles appear in that to the Romans. All of them with one exception (xii, 19) occur within the section, chapters ix-xi. There are thirty-six quotations in these chapters clearly taken from the LXX. There are six, which do not seem in most cases to represent clearly the Hebrew text but are very different from the LXX. Have we here a "Testimony book" again? Or have we rough translations out of Aramaic? At any rate, as in the case of the sections peculiar to Matthew's Gospel, I think we may see an indication that the section ix-xi is based in some way upon an early document, perhaps compiled by the Apostle soon after his conversion when he was demonstrating in the synagogues of Damascus that Jesus was Christ, and intended in the first instance for use among Jews.

The only quite certain non-LXX quotation in the Acts seems to appear, of all places, in the middle of Stephen's speech, where

in vii, 29 the word *πάροικος* seems to reflect faithfully the Hebrew of Ex. ii, 15 as opposed to the LXX.

Out of a total number of eighteen quotations James has five at most which are influenced by sources other than the LXX. It seems natural that this should be so in the case of a Palestinian. One might have expected even more. The form of all his quotations may be accounted for by supposing that he cited from memory.

Peter's good LXX quotations in his first Epistle are no doubt due to Silvanus. In the three which show differences from the LXX he is influenced in two by Paul and in one by James.

There is one clear non-LXX quotation in the Epistle to the Hebrews. Even the presence of one is surprising. It is the quotation of Deut. xxxii, 35 *Ἐμοὶ ἐκδίκησις, ἐγὼ ἀνταποδώσω* in x. 30 in a version which renders the original Hebrew and neglects the LXX altogether. But this version is identical with that found in Rom. xii, 19, the only Pauline non-LXX quotation outside of Rom. ix-xi. Are both dependent on a Semitic source, or is one taken from the other? And if so, which one? I imagine Hebrews, whose author was such a complete Hellenist, is dependent upon Romans, but I cannot pretend to make any suggestion as to why the Apostle Paul should make use of this version of this passage.

It is in the fourth Gospel and the Apocalypse that we find, especially in the latter, a kind of rough-and-ready treatment of the Old Testament material which links these two works together hinting at unity of authorship and sets them in a class apart. In the matter of the frequency of their direct use of the Old Testament they differ so widely that each stands at one extreme in the list of New Testament books which contain quotations at all. One may read page after page of John's Gospel without meeting any direct allusion to the Old Testament (though the thought is full of them). Similarly the Johannine Epistles contain no quotations or verbal allusions at all. On the other hand there are few consecutive verses of the Apocalypse which do not contain one. Yet when the style and manner of quotation in the Gospel and the Revelation are compared, they appear to me to be much alike. Of about thirteen quotations in the Gospel drawn from the LXX three contain substantial changes. In the quotation in i, 23 of Is. xl, 3, LXX *ἑτοιμάσατε* becomes *εὐθύνατε*, in that of Ps. lxxviii, 24 in vi, 31 *οὐρανοῦ* becomes *ἐκ τοῦ οὐρανοῦ* and *φαγεῖν* is added, and in that of Zech. ix, 9

in xii, 15 *χαῖρε σφόδρα* becomes *μὴ φοβοῦ*. Apart from these quotations from the LXX the evangelist gives us in xii, 40 an extraordinary version of Is. vi, 9, 10, which bears no affinity to the LXX and does not seem accurately to represent the Hebrew. In xiii, 18 he gives what appears to be an independent translation from the Hebrew of Ps. xli, 9, while in xix, 37 he again goes to the Hebrew of Zech. xii, 10 and writes *Ὄψονται εἰς ὃν ἐξεκέντησαν*, a rendering which significantly is reflected in Rev. i, 7 *ὄψεται αὐτὸν πᾶς ὀφθαλμὸς καί οἵτινες αὐτὸν ἐξεκέντησαν*. Now here is a writer who was accustomed to the use of the LXX, though he had an inaccurate, sometimes substantially inaccurate, memory for quotation from it, whose mind yet went back on occasion to the substance of Old Testament passages which he had learnt not from the LXX but in their original Semitic tongue. If there were no tradition of authorship or knowledge of the author's career, we should conclude, I think, in any case that here was a Palestinian Jew who for a long time had grown accustomed to using a Greek Bible.

The same is true to a greater extent of the author of the Apocalypse. Here also we have a man whose mind was soaked in the Old Testament Scriptures. He also is accustomed to the use of the LXX, but his allusions, nearly always short, are very rough, and it is sometimes difficult to tell whether he means to refer to the LXX or not. He makes substantial alterations in vocabulary. Such alterations occur sometimes in Luke, fairly often in Hebrews, occasionally in Paul, but more often than all in Revelation. Thus in ii, 23 *δοκιμάζων* becomes *ἐραυνῶν*, in iii, 19 *ἀγαπᾷ* becomes with necessary adaptation *φιλῶ*, in iv, 6 *πλησίον* becomes *γέμοντα*, in vi, 16 *βουνοῖς* becomes *πετραῖς* and *καλύψατε* becomes *κρύψατε*, in viii, 10 *Ἑωσφόρος* becomes *ἀστήρ*, in ix, 9 *παρατασσόμενος* becomes *τρεχόντων*, in xiv, 5 *γλῶσσα δολία* becomes *ψεῦδος*, in xv, 8 *ἐπλήσθη* becomes *ἐνεμίσθη* in xvi, 3 *ἐτελεύτησαν* becomes *ἀπέθανεν* in xviii, 23 *ἄρχοντες* becomes *μεγιστᾶνες*, in xxi, 7 *διεμέτρησεν τὸ προτείχισμα* becomes *ἐμέτρησεν τὸ τεῖχος*. In about nineteen cases the author may be said with reasonable certainty to take his quotations from the Hebrew and he perhaps does so in about nineteen more. In four cases, three of them all together in chapter ix, he uses a strange version based neither on LXX nor Hebrew, just as was the case in John's Gospel with Is. vi, 9, 10. This occurs rarely elsewhere, notably in Matt. ii, 6, v, 48 and xxv, 31. In four cases he mixes Hebrew and LXX in a

single quotation, notably where he adds together as names of the serpent the Hebrew Satan and the Greek διάβολος which is the LXX version of Satan in Zech. iii, 1. These phenomena do not belong to certain strata, but are spread over the book. Now what does this mean? Does it not indicate a man of ripe experience, his heart and mind filled with the thought and images of Scripture, one again accustomed to using the LXX, who yet did not "think in words", but rather saw, felt and experienced the inner meaning conveyed by the words, one whose early underlying knowledge of the Scripture had been gained through its original language, who did not refer to his Bible to verify his quotations, less perhaps because he had no Bible with him, though on Patmos that might have been the case, than because, it may be, his eyes were dim with age and reading had long been difficult or impossible, one in fact whose life and mind and outlook and writing might be summed up in the Psalmist's words, "My *meditation* of Him shall be sweet?" Is not this unmistakably the Apostle John in his old age?

Written Communications.

Mr. F. F. Bruce wrote: Dr. Atkinson's paper is one of very great importance; it is one to which students will turn in years to come as a helpful summary of the evidence on this subject; and the Victoria Institute is to be congratulated on having secured it for its Transactions.

Out of the many aspects of the subject on which one is tempted to comment, I select one.

Dr. Atkinson mentions the noteworthy quotation of Ps. lxviii, 18, in Eph. iv, 8, which reads, instead of the Massoretic and Septuagint text: "Thou hast received gifts among men," the opposite meaning "He gave gifts to men." The change from second to third person is insignificant in itself, because Paul is in any case referring to Christ in the third person; but why change "receive" to "give"? The change, as Dr. Atkinson remarks, is intentional; Paul adopts this reading because it alone fits his context; but where did he get it from? The answer is—from a Targum, or traditional paraphrase of the Hebrew Old Testament in the Aramaic vernacular. On the usual account, these Targums were not committed to writing until some centuries after New Testament times, but their written form preserves

a long-observed oral tradition. Now, the traditional Targum of the Psalms renders Ps. lxviii, 18, thus : *seleqta li-rqia'* [*Mosheh nebhiyya*], *shebhitha shibhyetha,* ['*allephta pithgamê 'oraytha,*] *yehabhta lehôn mattenan li-bhnê nasha* (" thou has ascended to the firmament, [Prophet Moses,] thou hast led captive captivity, [thou hast taught the words of the law ;] *thou hast given gifts to men* "). The Syriac (Peshitta) version of the Old Testament has practically the same reading, omitting the added phrases of the Targum, which we have put between square brackets.

Nor is this an isolated example of Targumic influence on the New Testament use of the Old Testament. A most important one is found in Mark iv, 12, in a quotation of Isaiah vi, 9f, in a form differing both from the Massoretic and LXX texts : " that they may behold indeed, but not see ; and hear indeed, but not understand ; lest they should turn and it should be forgiven them." The closing words " and it should be forgiven them " (Gk. *kai aphethê autois*) are a straight quotation from the oral tradition underlying the " Targum of Jonathan " (Aram. *we-yishtebeq lehôn*). This fact may give us a clue to the real meaning of the conjunction *hina* (" that ") with which the verse in Mark begins. If we take the whole verse as a quotation from the Targum, then Gk. *hina* represents Aram. *di*, a conjunction or pronoun with a very wide range of meaning. (It should be noticed, too, that the parallel passage Matt. xiii, 13, has *hoti*, " because," where Mark has *hina*.) In the present instance, *di* may be rendered by the relative pronoun " who," and the two verses (Mark iv, 11f.) may mean : " It is granted to you to know the secret of the kingdom of God ; but all these things come as riddles to those who are outside, who behold indeed, but do not see ; and hear indeed, but do not understand, so that they do not return and receive forgiveness."

G. H. Dalman, in *Jesus-Jeshua* (1929), p. 46, suggests that the quotation from Isa. lxi, 1f. in Luke iv, 18f., reflects the Targum on that passage. This would be natural enough, when we consider that after the Hebrew text was read from the roll of the prophet, the *methurgeman* would supply an oral paraphrase in Aramaic.

The wording of John xii, 41 (" These things said Isaiah, when he saw his glory ") reflects the text of the Targum of Isa. vi, 1, *chazethi yath-yeqara da-adonai* (" I saw the glory of the Lord "). And such

examples of Targumic influence on Old Testament quotations in the New Testament could no doubt be multiplied if an exhaustive comparative study were undertaken along these lines.

Air Commodore WISEMAN wrote : We are most sincerely grateful to Dr. Atkinson for his truly valuable summary and though we dissent from a very few of the opinions he expresses, we are aware that in this realm he is an authority. We cannot but acknowledge our debt to the careful and scholarly research which he has given to this subject ; the VICTORIA INSTITUTE is to be congratulated in having asked him to undertake it.

In referring to that part of the speech recorded in Acts vii, 7, Dr. Atkinson says Stephen " adds to the words of God to Abraham, etc." but is not part of this sentence in Genesis xv, 16, where ὧδε is the equivalent to " in this place," as the Hebrew implies ?

Is it not hazardous to assume an " echo " in Acts vii, 15, even though it avoids part of a difficulty ? It is most unlikely that there was any confusion in the mind of Stephen or in the minds of members of the Council as to precisely where the various patriarchs had been buried ; their tombs were only about 30 miles away and were well known. In so condensed a report of Stephen's speech we cannot assume too much. We know that Abraham erected an altar in Shechem (Genesis xii, 6 and 7) ; was he allowed to do this without buying the ground ? It is our lack of detailed knowledge which should prevent us in assuming a blunder on the part of Stephen or that a blunder of this character would pass, unchallenged by any member of the Council.

Is Col. iii, 1, a " lapse of the Apostle Paul's memory ? " δεξιᾷ is used in the LXX version of Ps. xvi, 11.

Is Mark i, 2, intended to be a verbatim quotation from Mal. iii, 1 ? Or Mark iv, 29, one from Joel ii, 13 ? May not Isaiah xl, 3, also have been in mind when Mark i, 2, was being written ? The New Testament writers often condensed into a summarised statement their reading of a wide range of literature, just as careful writers of the present day do. In many instances it was never their intention to quote verbatim ; the general sense was of more importance than a verbal citation from one specific place. We have many instances

of exegetical paraphrase as may be seen in the changes in Mark i, 2 (one of the variations cited by Dr. Atkinson). These changes were, I submit, introduced in order to make clear that the passage relating to Jehovah in Mal. iii, 1, had been fulfilled in Christ, so instead of "My face" he writes "Thy face" and "My way before thee" "the Way before Me." The verbal changes are deliberately exegetical, and I think Dr. Atkinson would agree, under the guidance of the Holy Spirit.

A reading of the paper impresses one with the difference between the Rabbinic method of quotation from the Old Testament and that of our Lord and the New Testament writers. Some scholars such as Döpke and Kuenen, have, quite ineffectually, laboured to establish a theory that the rabbinic method has been followed. Although in his early years Paul was schooled in this method it is not followed. Surprisingly enough the rabbis did not hesitate to alter the text, sometimes in a most arbitrary fashion, in order to produce a novel meaning. Now it can be said—and this is important—that the New Testament writers have not altered the Hebrew or Greek text Old Testament in order to gain an advantage or produce a "proof" to which the Old Testament scriptures bears no testimony, and in no instance does a New Testament writer cast doubt upon what is written in the Old Testament.

Mr. E. H. BETTS wrote: Dr. Atkinson has placed us under a deep obligation by his collection and classification of so great a mass of data. This must have been laborious work. It is to be hoped that the material he has gathered may be made permanently available for closer scrutiny, in a more detailed form. We thank him for his labours and for many hours of pleasure and profit derived from the closer examination of the Scriptures to which his paper has led us.

With a few of his deductions and suggestions, however, we are not in agreement. Stephen, for instance, is the last person to whom we could attribute "slips." He was "full of the Holy Spirit." He was "full of faith and power." He worked miracles. Keen contro versialists had not been "able to resist the wisdom and spirit by which he spake." His speech to the Council was a marvel of extempore oration and a model for all time of restraint coupled with purposeful selection. It was not errors in his address that aroused

the fury of his judges but the undeniability of its complete historical truth. Had there been blunders these acute and critical opponents could not have failed to detect and ridicule them. Whatever appears in our present text of Acts vii, 16, it is all but impossible for Stephen to have uttered it as it stands or the Council to have allowed it to pass unchallenged. That there is a discrepancy, and that a difficult one, is admitted. With our present knowledge it cannot be resolved. But there is nothing unresolvable given more information. Abraham quite probably bought land in Shechem, where he had interests. Jacob may have repurchased after a lengthy lapse. There *was* a burial place in Shechem, for Joseph's bones were laid there. This is not claimed as a solution, but it could be, if coupled with the possibility of a textual corruption in Acts vii, 16, arising late in the first or early in the second century A.D. Stephen may have referred to both the national burial places, and his double reference become fused into one muddle by the omissions of a tired copyist. His argument would have lost no force by such double reference since the point he was making here was the necessity of *purchase* in the land which was the promised inheritance.

For the rest, an " echo " is not a quotation. The former at its simplest is a purely verbal affair and may imply no allusion to the events of the original passage. Where Stephen undeniably quoted (in Acts vii, 6–7b), he marked the quotation most definitely by means of the introductory and closing formulae, viz., " God spake on this wise " and " Said God," respectively. There are all grades of transition between a quite unconsciously used " echo " and a quotation involving conscious allusion to a passage or an event. All writers and speakers utilise the verbal echoes which reverberate in their minds from past reading or other experience. But they cannot therefore be held to have made slips. Even where there is a measure of conscious quotation there may be a transference of reference without risk of imputation of blunder, as in the frequent quotations in different contexts of Mr. Churchill's famous words about the indebtedness of the " so many to so few."

Moreover, Stephen exhibited, throughout, the maximum of self-control and superiority to " strain." He was a specially selected messenger (" angel ") for a critical occasion and was taken note of as such (vi, 15) by his enemies—to their greater guilt ; and his whole

conduct was in beautiful keeping with such a role—in its calm, its respectfulness to others, his freedom from what was personal (even in his scathing denunciation) and finally in his prayer for his enemies at the moment of maximum physical strain. He displayed *eg̃krateia*, that noble fruit of the spirit (self-mastery), to the full. This, surely, would be incompatible with the failure implied in the commission of foolish blunders.

It is not good enough to say, merely, with Jerome that New Testament writers "had regard to the meaning and not to the words." For, as inspired men, they had the words at their command —and selected and adapted and changed, to suit their divinely ordered purpose. Nor is there need to invoke inaccuracy of memory, which implies failure. The four instances given by Dr. Atkinson of inaccuracy can be otherwise accounted for. In Matt. vii, 23, *apochōreite* is a better because stronger word than *apostēte* since it expresses separation in both its elements, being literally equivalent to "separate away from." In I Cor. i, 19, also, *athetēsō* connotes intended, purposed rejection and so is more apt than *krupsō* (hide). Similarly, in Heb. ii, 12, in the preference given to *apag̃gelō* (bring tidings) over *diēgēsomai* (narrate) there is intended the hint of a new and fuller revelation. Eph. iv, 8, is fascinating, and (as Dr. Atkinson suggests) the alteration is quite doubtless deliberate and no failure of memory. The apostle seems to quote the Psalm (lxviii, 18) substantially unchanged up to a point, and then break off into an interpretation while, as to form, still quoting: "He led captivity captive and—as by revelation I may now put it—*gave* gifts unto men." Likewise *pasa sarx* of Rom iii, 20, etc. is more exact because more particularized than *pas zōn* of Ps. cxliii, 2. It is the unregenerate man, and not all living, who needs justification.

What Dr. Atkinson, in his last paragraph, says beautifully of the aged apostle John is largely true of all the New Testament writers, especially the apostles. They *had* regard to the meaning and not to the words. But far from "slipping" in the use of the latter, as inspired men, they made them serve the divinely ordained end. And their minds, formed from scripture, were richly furnished with echoes and quotations—both.

Brig.-General H. BIDDULPH wrote: In Stephen's speech in Acts vii., I do not think that the variations in some of his historical

statements from the fuller accounts in the Old Testament are due to his "making an extempore speech under conditions of stress and excitement." He was addressing the Council of the Jews, and was not instructing Gentiles in the details of Old Testament history. His theme was the perpetual unbelief and hard-heartedness of the Jews throughout their history. To avoid breaking the thread of his argument, the historical details had to be reduced to the lightest connecting links. For instance, take verses 15–16. Suppose he had said "So Jacob went down into Egypt, with our fathers, and died there and was carried over to the cave of Machpelah, which Abraham bought from Ephron the Hittite for a sum of money. His sons also died in Egypt and were carried to Shechem and buried in the plot of ground which he bought of Hamor, the father of Shechem" (Jerome states that the patriarchs as well as Joseph were buried in Shechem). It will be seen at once how this accurate historical statement breaks the thread of and detracts from the force of Stephen's address, without adding anything of value, or which his audience did not know thoroughly. Moreover, Stephen's actual statement is merely an example of that peculiar Hebrew grammatical idiom, called *constructio praegnans*, by which two different ideas were coalesced into a single sentence. The same reasoning applies to verse 7.

Mr. W. F. SPANNER wrote: The learned author has given us a valuable paper which gives evidence of painstaking research. We owe him a debt of gratitude, and I should like to thank him for what he has given to us.

I have a few observations to make. The author states that what mattered to the apostles was not so much the exact words of scripture as the meaning which lay behind the words. This is, I agree, true, but inasmuch as words form the vehicle by which meaning is conveyed the words themselves are important. The greater the importance which attaches to an idea the greater becomes the necessity for choosing with exactness the form of words to convey this idea. I think it is perfectly reasonable to believe that the writers of Holy Scripture chose their words with scrupulous exactness in view of the vital importance of the message which they were chosen to convey.

The author has suggested that the writers of the New Testament were guilty of inaccuracy of memory in their use of the Old Testament. Surely it is nearer the truth to say that the New Testament writers wrote freely under the supernatural impulse of the Holy Spirit (who is the true author of original Holy Scripture), and did not consider themselves bound to follow the exact wording of the Old Testament. The promise that the memories of the apostles should be supernaturally aided by the Holy Spirit is given in John xiv, 26.

Again to suggest, as the author does, that Stephen was guilty of a slip seems to me to be choosing an easy way out of a difficulty. Stephen is said to have been " full of the Holy Ghost " (Acts vii, 55). Would it not be better to admit that the solution of the difficulty mentioned by the author cannot be resolved in our present state of knowledge, rather than attribute a " slip " to Stephen ?

Mr. B. B. KNOPP wrote : The VICTORIA INSTITUTE is indebted to Dr. Atkinson for his valuable Paper, which is obviously the product of much labour and study. If I venture to make a few remarks thereon, it is not as a mere captious critic, but because it appears to me that if we *confine* ourselves to a close scrutiny of the actual text, we may miss something of the grand majesty of the Word of God. We may fall into the error of inventing a human explanation for something which can be revealed only by the light of the Spirit of God.

Among the reasons given by the author for modifications by the New Testament of Old Testament passages is inaccuracy of memory. I think a true believer in verbal inspiration would be very reluctant to accept such a view. Is it necessary, for instance, to assume that such a passage as Matt. vii, 23, is intended to be a verbatim quotation ? Would not the similarity of language be accounted for by the Evangelist's being steeped in the Old Testament, just as Englishmen of say Bunyan's time were steeped in our Authorised Version, with the effects on their language which are so well known ?

If the Holy Spirit by Stephen (for he was filled with the Holy Ghost) says that God spoke certain words to Abraham, who are we to say that He didn't, even though they are not recorded in Genesis,

and similar words were spoken to Moses ? The substance was certainly conveyed to Abraham on more than one occasion. See especially, Gen. xv, 18. Again, Acts vii, 15, may be an echo of the language of Ex. i, 6, but it is an echo of the fact of Gen. xlix, 33. As regards verse 16 of this chapter, there are a variety of ways in which the seeming contradiction may be reconciled. It may be that Jacob extended the original purchase of Abraham. That the two transactions were not wholly unconnected seems probable from the fact that both pieces of land were used as burial places.

It is interesting to recall the work of a scholar of a past generation, in this connection. Like Dr. Atkinson, Bishop Horne lists a certain number of quotations from the LXX, and a certain number which appear to be borrowed but not verbatim. He lists others which have the same meaning but are differently phrased, others that more accurately represent the original Hebrew, and still others that differ from both original Hebrew and LXX. The numbers in each category must always be matters of opinion, and subject to modification as research goes on, but if anything is proved thereby, it is that when the Holy Ghost in the New Testament quotes something He said in the Old, He is completely independent of all human versions. He is His own infallible Interpreter.

Author's Reply.

I am very grateful to all those who commented on my paper for their kind remarks, and especially to Mr. Bruce for observations which greatly add to whatever value my paper may originally have had. Most others who have kindly commented seem to have concentrated on Stephen's speech. Obviously, I cannot here reply in great detail, but may I summarise as follows ? (1) My remarks primarily concerned the text of the quotations, not the matter of them. (2) Assuming that the speech contains inaccuracies, this does not affect the record of the speech except, as I have tried to show, to enhance the impression of its accuracy and inspiration. (3) Assuming that the textual form of some of the Old Testament quotations which appear in the New Testament is due to inaccuracy of memory on the part of New Testament writers, it is my belief that this and all other circumstances were overruled and used by the inspiring

Spirit. (4) I believe with all my heart in the plenary inspiration, complete authority and perfect infallibility of the Scriptures of the Old and New Testaments.

May I again thank all those who by taking the trouble to comment have emphasised my points or indicated weaknesses of matter or argument ?

(Issued on the 10th February, 1947.)

THE PRESENT STATUS OF TELEOLOGY.[1]

By Lt-Col. L. Merson Davies, D.Sc., Ph.D., F.R.S.E., F.G.S.

"*The fool hath said in his heart 'There is no God'.*" (Ps. xiv, 1).

"*Verily Thou art a God that hidest Thyself, O God of Israel, the Saviour.*" (Is. xlv, 15).

1. The Ethical Issue.

IT is a remarkable fact that while Scripture calls the existence of God *as God* obvious to all but the mentally defective, it calls the existence of God *as Saviour* anything but obvious. In other words, nature makes the intelligence and power of God much more apparent than His graciousness. This should be remembered when, after nearly two milleniums of professing Christianity, and much recent stressing of the love of God with little mention of His wrath, many suppose that the design everywhere apparent in nature cannot be attributed to the God of the Bible unless it everywhere argues benevolence on His part. However forcibly a writer like Sir Charles Bell may appeal to a structure like the human hand as indicating conscious design[2], it is thought to discount his appeal when design is equally apparent in the elaborate mechanism of a viper's poison fangs. As the object of the latter is far from benign, the unmoral (or neutral) Darwinian theory is held to afford a more consistent explanation of adaptations in general, since it views them all as resulting from factors which produce what will benefit each species, however noxious the result may be to members of other species.

That is the situation which faces us today. The harsher facts of nature, such as fear, disease, suffering of all kinds, sorrow, decay and death, aborted structures, and all the myriad adjustments and specialisations for internecine strife, are held to

[1] TELEOLOGY: "The argument from design, in proof of the existence of God" (*Cassell's Dictionary*).

[2] "The Hand," *Bridgewater Treatise*, 1833.

oppose belief in a loving Creator, and combine to favour some philosophy like the Darwinian, which regards organic features as resulting from the action of Natural Selection on fortuitous Variations during a ruthless Struggle for Existence. According to this view, structural adaptations were not pre-designed to meet the circumstances of existence, but were produced by the circumstances themselves—much as a casting is not separately made to fit its mould, but has its shape determined by the mould. (Variability, on this analogy, would be represented by the molten state of the substance committed to the mould; while the force of gravity represents the Struggle for Existence adapting the consequent—or Surviving—Form to certain Conditions, represented by the shape of the mould. The analogy is crude, but may illustrate the idea).

The philosophic completeness of this view makes it attractive to many, while the supposed inadequacy of the Christian view is underlined by good men who write and speak as if the first two chapters of Genesis gave the full Bible account of the origin of nature as it exists today. This follows from the deplorable habit of regarding the "Days" of Genesis i as prolonged geological periods. That practice, the object of which is to identify the geological record with the events of the Hexaemeron, causes all the trouble; for it makes one regard fossil conditions (which were obviously similar, in harsher characters, to those of today) as being what God considered "very good." That at once eliminates the third chapter of Genesis from all bearing on current conditions, and commits those who hold the "period" view of the Six Days to defending the existing state of nature as ideal. Naturally, the opponent of Scripture exults—like Haeckel—in "dysteleology,"[1] or countless evidences of discordance with the ideal.

If, then, one is to discuss teleology, or the evidence of design in nature, from the Christian standpoint, one must accept the whole Bible explanation of the existing state of nature. This one can only do by treating the third chapter of Genesis as seriously as the first two. (For that reason, I did not subscribe a paper

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[1] "*Dysteleology, or the theory of purposelessness* (is) the name I have given to the science of rudimentary organs, of suppressed and degenerated, aimless and inactive, parts of the body; . . . . which . . . . is alone sufficient to refute the fundamental error of the teleological and dualistic conception of Nature" (E. Haeckel, *History of Creation*, Eng. ed., Vol. II, p. 353). The "fundamental error" is no doubt due to forgetting the Curse, and thinking that the Bible calls all nature perfect.

for the Gunning Prize Essay, 1937, since it allowed only of taking the "First Two" chapters as a "basis" of natural science. I indicated my objections in the discussion following Dr. Hart-Davies' paper; and to my remarks there I must, to save space, refer present readers. I was inevitably forced, in this connection, to discuss the "period" theory of the Six Days, which Dr. Hart-Davies necessarily accepted as justifying concentration on the first *two* chapters of Genesis; so I would ask readers to note all the objections to it which I mentioned there, and observe how little those who favour the "period" theory could say in reply. Compare my condensed and multiple arguments on pp. 79–83, Vol. LXX, 1938, with pp. 203–211, Vol. LXXII, 1940, which profess to defend the "period" view, but, at great expense of words, do little more than question the identity of the Seventh Day with the literal Sabbath; a most doubtful reply even on its own small score).

I must therefore continue to emphasise what I have been saying for over forty years (and what Pember said before me, and one of the leading botanists of the last century said before Pember), namely, that the third chapter of Genesis provides the essential means for reconciling the deplorable state of nature, as found today, with the account of an ideal state resulting from God's works described in the first two chapters of Genesis.

Here is the answer to Haeckel and his like. It is really remarkable that, in the severe economy of that crucial third chapter, the three structures mentioned as typifying the general Curse upon nature *are all peculiarly representative of ABORTION and INTERNECINE STRIFE*. Thus the serpent, Cursed "above" all other animals, is deprived of limbs and made to go upon its belly; while mortal enmity is instituted between it and man. Similarly, thorns are aborted branches and leaves,[1] etc., often extremely unpleasant to man and beast; while thistles, cited as thriving at the expense of man, owe their noxious properties to an aborted state of the calyx.[2]

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[1] "That thorns are, in reality, undeveloped branches, is shown by the fact that they are connected with the centre of the stem, that they bear leaves in certain circumstances, and that under cultivation they often become true branches. Many plants are thorny in their wild state, which are not so under cultivation, owing to this transformation" (Prof. J. H. Balfour, F.R.S., *Phyto-Theology*, 1851, pp. 110–111). And Dr. Marie Stopes says that "in the Cactus the leaves are all reduced to needle-like spines" (*Botany*, pp. 17–18, 63).

[2] "The calyx is not developed as in other plants, but is abortive, blighted as it were and changed into hairs, which . . . . indicate degeneration. Thus thistles add to the sweat and toil of man" (Prof. J. H. Balfour, *Op. cit.*, p. 147).

It seems clear that the Bible has its own way of accounting for the harsher facts in nature, whose existence it recognises as definitely as Darwin did. Perversion of function, abortion, conflict of interests, with internecine strife, pain, fear and death etc., are all allowed for in that brief but pregnant story of the Fall and Curse. We may, indeed, compare the Bible view of nature with that of Darwin by saying that the former offers *two opposed factors* to account for what we see, namely, perfect Creation superimposed by universal Curse; while the latter stakes all on blind compulsion—represented by survival values in a struggle for existence.

That puts, I submit, a very different complexion on matters from what is commonly supposed to exist. The Bible does not share the illusions about nature which have been—if they are not still—cherished by many Christians. Tennyson's lament about "Nature, red in tooth and claw" (when Darwin shocked contemporary sentimentalists by concentrating on all that they glossed over) is matched by Paul's grim generalisation that "the whole creation groaneth and travaileth in pain together until now" (Rom. viii, 22), and Isaiah's insistence that only when the wolf lies down with the lamb, the lion eats straw like the ox, and the cockatrice (Heb. *tsepha*, or viper) stings no more, will things be as God would have them (xi, 6–9; lxv, 25). The lion's diet and serpent's harmlessness, here predicted, obviously recall conditions before the Curse (Gen. i, 30–31).

Now it is clear that the *two opposed factors* indicated in Genesis as accounting for structural characters, have marked advantages over the Darwinian means for explaining the same. Sir Charles Bell may well claim that the perfection as an instrument of the human hand proves the intelligence of a benign Creator; for the evolutionist finds it by no means easy to explain how that hand could have been derived from any terminal specialised for progression among the trees.[1] The thumbs of the greater apes are much reduced in size, and their fingers are degraded to the status of mere grasping hooks; while the muscles of their forearms are so specialised that these creatures cannot even place the palms of their hands on the ground, as we do when going "on all fours," but can only apply their knuckles to the ground and use their forelimbs as crutches.

[1] Darwin characteristically glossed this over, assuming that, to get a human hand, an ape had only to cease using his own for progression (*Descent of Man* 2nd ed., p. 77).

At the same time, it is obvious that the existence of the viper's fangs agrees well with the terms of the Curse; while their production is hard for the Darwinist to explain. It is amusing to see how Dr. E. Nicholson, when trying to show how such fangs might have evolved, had to concoct an ancestry out of creatures that could not possibly have been the viper's progenitors, since each stood at the end of a very different supposed lineage (*Indian Snakes*, 2nd ed., p. 43). He had also to place the simplest poison apparatus (that of sea snakes, or Hydrophidae) furthest from the supposed common stock (Tortricidae), and the most complicated apparatus (that of the Viperidae) nearest to that stock! The subject obviously bristles with difficulties for the transformist; and the candid Mr. St. George Mivart, although an evolutionist, declared regarding another group of serpents that "The ancestors of the rattlesnake are beyond our mental vision" (*Types of Animal Life*, p. 149). So here again the Christian may claim that the facts support belief in special Creation; for, granting the companion doctrine of the Curse, the intelligence of God can just as well appear in His penal machinery, as the intelligence of man appears in, say, the electric chair.[1]

2. Organic Adjustments.

Let us now see what are the chief requirements for a materialistic explanation of organic structures—one which may account for their intricate purposiveness without reference to creative Intelligence. And here we may note that these requirements are, in effect, those of the Darwinian theory itself; for no other theory has yet been invented which makes anything like a thorough-going attempt to account for organic nature on purely

[1] As I stress the Curse *since Adam and Eve fell*, and hold that six literal days of Creation brought the whole existing world of life into being, it is clear that I believe in separate creations—as most geologists did a century ago. Belief that previous creations were destroyed involves belief that they had penal histories, no doubt similar to our own; so there is nothing incongruous in finding that fossil faunas and floras exhibit similar characters to our own, and I refuse to let merely parallel phenomena in geology prevent my noting *the marked agreement of Genesis i.–iii. with nature as we find it.* How to reconcile real or apparent continuity in geology with belief in separate creations *and exterminations* of world faunas and floras is far too big a subject to be discussed here. The matter is dealt with in chapters VIII and IX of my book *The Bible and Modern Science.*

mechanical and non-teleological lines[1]. Every other evolutionary doctrine, without exception, makes some concession, open or veiled, to teleology, by admitting some factor which goes off those lines. As such factors we may cite the " élan vital " of philosophers like Bergson[2] and the " entelechy " of biologists like Driesch,[3] who believe in the intelligent action of life forces ; the " orthogenesis " of many like L. S. Berg,[4] who think that the course of evolution is determined in advance, rather than progressively shaped by fortuitous conditions ; and even the " saltations " of those like De Vries,[5] who think that evolution progresses by great and unaccountable leaps.[6] These admissions of the incalculable are all anathema to the more rigid materialist (invariably an extreme Darwinist) who realises that they leave loopholes for—if they do not directly necessitate—belief in some external creative power, or God of some sort, even if not the very particular God of the Bible. And that is why, to this day, desperate efforts are made to keep the sorely battered and riddled Darwinian theory to the fore, as the only real hope of the anti-teleologist. What, then, are its requirements, as such a hope ?

Perfect Gradation.—The first requirement, as Darwin realised when he insisted so stubbornly that " Natura non facit saltum", is that there shall be no leaps, or discontinuities between structures, but that perfect gradation of the most infinitesimal kind must link even the most diverse and specialised forms, just as perfect continuity of substance links the most widely separated twig-tips of a tree to the common trunk. For it is only by postulating infinitesimal gradation that one could hope to explain, on purely mechanical lines, the intricate and minute adjustments found, *e.g.*, in the human eye, where more than a million rods and cones appear in the central pit, alone,[7] of the yellow spot of the retina ; besides countless other adjustments of a most complicated kind, all perfectly co-ordinated to secure effective vision.

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[1] " Darwin's explanation . . . does not appear to offer an adequate explanation of the observed facts . . . On the other hand, if Darwin's hypothesis be rejected there is, it must frankly be admitted, no satisfactory alternative to take its place " (Prof. W. B. Scott, *The Theory of Evolution*, 1917, p. 25).

[2] H. Bergson, *Creative Evolution*, 1913.

[3] H. Driesch, *Gifford Lectures*, p. 106, etc.

[4] L. S. Berg, *Nomogenesis*, 1926, p. 111, etc.

[5] H. de Vries, *Die Mutationstheorie*, 1901.

[6] I omit reference to Lamarck, since his less materialistic system was practically eclipsed by Darwinism. I here refer to Darwin's later rivals.

[7] This astonishing fact was vouched for by Prof. W. K. Clifford, F.R.S., in his book *Seeing and Thinking*, pp. 46–7. The number is obviously very great.

Survival Value.—What is more, it is essential that there should not only be perfect gradation, but also that each infinitesimal step in this gradation should have survival value over its immediate predecessor in the series.[1] Only on condition of its possessing such advantage (in the Struggle for Existence) could the selection and fixing of each minute step be explained on a basis of blind and fortuitous compulsion.

Absence of Useless Features.—It also follows that there can be no really useless structures. Thus every organic feature, however small, is a liability to its possessor. By the very fact of being alive, it demands nourishment; so, unless it makes adequate return for the same, it is not only useless but noxious. And if any *blind* force (like Natural Selection) automatically fixes the most infinitesimal advantages (to produce complicated structures), it must equally attack an infinitesimal disadvantage. Even Darwin saw this, and repeatedly insisted that Natural Selection would rigorously attack anything that was in the least degree harmful (*Origin of Species*, 6th ed., pp. 63, 117–118, 163 etc.; *Descent of Man*, 2nd ed., pp. 71, 93 etc.).[2] It is important to remember this; for the agencies postulated by the materialist are anything but conservative. By the very fact of being evolutionary forces, they care nothing for the past. Their ceaseless effort is (*ex hypothesi*) to adapt the species to existing conditions; and so they must continually and ruthlessly attack all mere relics of previous adaptations. Whenever, therefore, a materialist tries to prove the fact of descent by claiming to find vestiges of the past incongruous to the present, he directly discredits his own supposed agents of evolution, and justifies the teleologist's claim that the more marvellous organic structures could only have been produced by Divine action. The more numerous and useless the supposed vestiges, and the greater the periods since their supposed usefulness, the more incompetent they prove the supposed agents of evolution to be. It may sound paradoxical, but it is a fact, that the only belief which really useless rudiments could support is belief in special Creation.

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[1] As E. S. Goodrich says: "In the evolution of an organ by Natural Selection every stage must be useful, and it is often difficult to picture the intermediate conditions" (*Living Organisms*, 1924, p. 141).

[2] That he nevertheless claimed "useless" rudiments as proving evolution shows his inconsistency as a thinker. T. H. Huxley refused to follow him here.

Specific Selfishness at all Stages.—It is equally clear that these blind mechanical agents of evolution, concentrating on (or Naturally Selecting) whatever promotes the Survival of each species in the Struggle for Existence, know nothing of sympathy between species. Any altruism would handicap the benefactor, in a Struggle during which the slightest disadvantage would be fatal to Survival. If any purely altruistic structure were found to exist, therefore, its presence would directly discredit the efficacy of the supposed agents of a materialistic evolution. Like a really useless "rudiment," and for the same reason, an altruistic structure would wreck the case for materialism. Darwin himself declared as much, saying that: "If it could be proved that any part of the structure of any one species had been formed for the exclusive good of another species, it would annihilate my theory" (*Origin of Species*, p. 162). These are strong words, and the admission should be remembered.

To sum up: In order to justify the materialist's claim that all organic nature "is formless, unplanned, owing its character to accidental events" (Prof. D. M. S. Watson, *The Listener*, 1942, p. 621),[1] it is essential for him to prove:—

(1) That infinitesimal gradation links all organic structures to each other; and

(2) That each infinitesimal step along each diverging line possessed survival value over its predecessor.

(3) That no vestigial structure exists which is in the least degree harmful, or even superfluous, to its present owner; and, equally,

(4) That no structure in any one species is of use solely to members of another species.

Needless to say, neither Professor Watson nor anyone else has ever proved these things—or is ever likely to prove them. Many have not even the wits to see the necessity for proving them; for, as the Bible says, materialists are not mentally normal.

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[1] It is disgraceful that such nonsense, which Prof. Watson did not dare to defend when challenged by Mr. Douglas Dewar and myself, should have been broadcast to the public. Even Prof. A. Einstein, although a professed pantheist, insists on "the sublimity and marvellous order" revealed in nature and talks of his "rapturous amazement at the harmony of natural law, which reveals an intelligence of such superiority that, compared with it, all the systematic thinking and acting of human beings is an utterly insignificant reflection" (*The World as I see It*, Eng. ed., 1935, pp. 25, 28).

But the necessity exists, whether appreciated or not; and in absence of proof, the materialist, like the Christian, walks by faith, not by sight.

The Christian, of course, knows that he walks by faith. He leaves it to the materialist to walk by faith without knowing it. He realises that he was not there to see how things came into being. He trusts the statements of a Book which existed before he was born, and which he has reason to regard as Divinely Inspired. For the vindication of his trust, he is prepared to wait. In the meantime, it is clear that the two Biblical factors (for explaining the state of things in nature) namely, perfect CREATION superimposed by universal CURSE, make no such demands as are inevitably made by the supposed agents of the materialist. There is no need whatever, so far as the Bible factors are concerned, for infinitesimal gradation between types, much less for survival value at each minute step over the last along every line; while the existence of harmful elements is amply allowed for by the Curse, at the same time that species may well, on the doctrine of original perfect Creation, sometimes exhibit purely altruistic structures.

How, then, do the known facts regarding organic structures suit these two very different beliefs regarding their origin? Which belief do they seem to favour most?

As regards the first materialistic requirement—perfectly graduated series—it is notorious that no such thing exists in nature *except in embryology;* and it only exists there because, in the first place, the end is determined from the beginning,[1] and, in the second place, the embryo is not a working machine.[2] Limbs are sketched out, in the rough, long before they have any capacity for functioning as limbs; eyes of vertebrate type are adumbrated, with their accessories, long before they are capable of combined functioning for sight, etc. Nor is any

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[1] As De Beer says: "if development occurs at all it conforms to the type of the species .... the possible qualities are pre-determined" (Art. "Embryology and Evolution," in *Evolution* by Prof. E. S. Goodrich, 1938, p. 63).

[2] "The embryo is not like a finished piece of mechanism .... it is unfinished, it is like a piece of mechanism in process of construction, and its activities consist in a ceaseless progress towards .... completion" (J. W. Ballantyne: Art. "Human Embryology" in *Green's Encyclopaedia and Dictionary of Medicine and Surgery*, 1907, Vol. III, p. 71).

regard paid, during development, to supposed ancestral phases.[1] The one obvious consideration ruling matters, during production, is the convenience of the developing creature, as such.

This is significant to anyone familiar with mechanical problems, for the same can be said of man-made machines. Intermediate phases in perfect gradation appear during the production of such; but no perfect series connects the finished machines, because every design for an intermediate purpose represents a solution of problems of its own, requiring specialisations of its own, which throw it out of exact series between other designs. Finished organic structures bespeak special design just as definitely as finished man-made structures bespeak it; and no argument against such design can be found in productive processes, either in the one case or in the other.

Nature, in fact, testifies to creation, not evolution; and it is the same story everywhere. The fossil record is most emphatic in this respect, and opens with a colossal anomaly—on the evolutionary point of view. For the oldest (Lower Cambrian) fossils are by no means the simplest, but include a mass of highly organised and widely differentiated forms representing all the main invertebrate Phyla, or groups, existing today. These include Annelids identical (according to P. Lemoine) with ones living in our seas today, Jellyfish (*Medusites*), Sponges (Lyssacina), Corals (*Archaeocyathus*), Echinoderms (Cystoidea, Holothuroidea), many Brachiopods (*Lingulella, Kutorgina, Acrotreta, Obolella*),[2] Molluscs of all kinds including Lamellibranchs (*Fordilla*), Gastropods (*Stenotheca*), and most advanced types like Pteropods (*Hyolithes, Coleoloides*) and even Cephalopods (*Volborthella*); while there are numerous Arthropods, including Eucrustraceans (*Protocaris*) and many families of Trilobites (represented by *Agnostus, Eodiscus, Conocoryphe, Olenellus* etc.). As E. Koken admits, all these widely different types are "sharply defined" from the first; "and of those periods in which they might have been united we have no record" (*Paläontologie und*

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[1] As G. Stanley Hall points out, the embryo heart develops before the blood-vessels, but this reverses the supposed phylogenetic order (*Adolescence*; Vol. I, p. 55). Similarly, E. S. Goodrich remarks that the respiratory surface of the lung "which is the last to appear in the embryo, must have been present from the first and throughout phylogeny" (*Studies in the Structure and Development of Vertebrates*, 1930, p. 612).

[2] Italicised names within brackets are of genera selected as representing separate families. The terms Cystoidea and Holothuroidea refer to separate classes.

Deszendenzlehre, p. 12); and W. W. Watts says: "If this is really the beginning of life, evolution in these early stages is at once disproved" (*Geology*, p. 99). According to Chamberlin and Salisbury, the great divergence and specialisation of the earliest fossils compel us to believe that "pre-Cambrian" evolution must have been "from sixty to ninety per cent. of the whole" (*Geology: Earth History*, Vol. II, p. 294). Lemoine (*Enc. Française*, Vol V, 1938, p. 5, 82–7) goes further, and calls it at least ninety-nine per cent!

Why, then, is no trace to be seen of this vast previous history of life, which the evolutionist has to postulate? According to Watts (*loc. cit.*) the enigma is increased by the very aspect of the oldest known (Lower Cambrian) fossil fauna, for: "It is distinctly specialized, and shows the characters usually found in a deep-sea assemblage, such as might have been separated out from a richer fauna and to have adventured out into a new environment." On the theory of Creation, there is obviously no difficulty here; but on the theory of evolution it is utterly incongruous that we find so much of a specialised fauna, and nothing of all the rest, in time and space, that should both have preceded *and accompanied* it. Darwin himself was nonplussed, and admitted that he could not explain the absence, below the Cambrian, of the "vast piles of strata rich in fossils" which his theory required. He said that this absence might be "truly urged as a valid argument" against his views (*Origin of Species*, p. 287).

Evolutionists have therefore made many efforts, during the last ninety years, to square this absence with their creed. Some have suggested that pre-Cambrian rocks are too metamorphosed to retain traces of life-forms. But this would neither explain the *suddenness* with which the Lower Cambrian fauna appears, nor the absence of the *contemporary* "richer fauna" postulated by Watts; and the suggestion itself has been definitely disproved by the finding of vast masses of unmetamorphosed pre-Cambrian sediments (like the huge Cuddapah series of India, over 20,000 feet thick) which are perfectly suited to have preserved fossil traces of life—had life existed.[1] Other writers, like Prof. Watts himself (*loc. cit.*), "hazard the conjecture" that lime was

[1] For general remarks on the Cuddapah system, see D. N. Wadia's *Geology of India*, 1939, pp. 86–88; and Prof. J. W. Gregory remarked that "There are among the pre-Cambrian rocks many which might have been expected to preserve any fossils entombed in them" (*The Making of the Earth*, pp. 244–5).

deficient in the early sea, and that pre-Cambrian forms had purely chitinous tests, which would be less easily preserved than calcareous ones. But that also does not explain the suddenness with which the record opens (for Watts says that the Cambrian tests themselves were only "very slightly strengthened with lime salts"); much less does it explain the absence of the richer coastal fauna which he himself postulates, and to which lime from denudation would have been more available. Indeed, since Cambrian faunas include jellyfish, which have no hard parts at all, and show traces of the soft parts of other creatures, like the swimming organs of Pteropods, it is obvious that chitinous tests and even soft-bodied creatures should have left fossil indications long before the Cambrian—had they existed. So the case is still just as inexplicable (from the evolutionary point of view) as it was in Darwin's day.

What is more: Analogous facts appear throughout the fossil record itself; for links are invariably missing just where they are most needed, and should be most numerous. Essentially new types always appear suddenly; the greatest problems being solved outright, without any clue as to how they were solved. Nobody knows how crinoids originated. The first amphibians have true feet, there being nothing to show how any fin became a foot. Swimming molluscs (Pteropods) appear at the base of the record; while their supposed ancestors, the Opisthobranchs, do not appear until the Carboniferous, some two hundred million years later. Those unique reptiles, the Chelonians (Turtles, etc.) are clearly characterised from the first. The great swimming reptiles (Ichthyosaurs and Plesiausaurs) and flying reptiles (Pterodactyls) also appear suddenly, without anything to show how they could have developed from quadrupedal forms. And so one could continue. The first birds have large and perfectly formed feathers, there being *nothing* to put between a feather and a scale. The first bats are perfect bats, and even include a still existing family (the Vespertilionidae). The first whales are as true whales as any existing today, and include quite different types, one of which belongs to the existing order of Odontoceti, and seems to have no connection with the others; so here, again, we find full specialisation and differentiation right from the beginning. The first insects include the largest ones known to us—*Meganeura*—or monster dragonflies, with a wing-span nearly a yard in extent; also numerous cockroaches of

many kinds. The earliest known scorpion is hardly distinguishable from existing ones, and has such a well-developed poison apparatus that it is named *Palaeophonus*, or ancient murderer. It is the same with the whip-scorpions, which are fully characterised from the first. Spiders also appear suddenly, and are practically unchanged from the start. Among the first water-fleas we find the modern genus *Estheria*.

It seems clear that all this is totally opposed to the Darwinian (materialistic, or anti-teleological) creed. The latter, as we have seen, insists that four-legged creatures, like lizards or mice, became flying ones, like birds or bats, or swimming ones, like ichthyosaurus or whales, by incredibly long series of slow changes, during which every slight modification towards the new end gave its possessor an advantage over those who had not that modification. The very idea is, of course, fantastic, since it is obvious that intermediate stages, in such cases, could not possibly have been advantageous. A leg would be useless as a leg long before it became effective as a wing ; so Natural Selection would kill off the intermediate types, and prevent progress along that road. As common-sense experts like L. Vialleton[1] and Prof. D'Arcy Thompson[2] have insisted, it is impossible even to imagine effective intermediate types in such cases, and it is useless to look for what can never have existed. The marked absence of such types, in the fossil sequence, fully endorses their opinion.[3]

How, then, does the materialist react to this truly damning aspect of the fossil record—so far as his creed is concerned ? It is significant that, at all these crucial points, the neo-Darwinist (or later materialist) *himself discards his supposed agent for evolution—Natural Selection.* However useful he may find it when professing to explain minor and relatively straightforward matters, like the lengthening of a tooth or the shortening of a toe, it becomes his worst enemy instead of his ally where the major problems are concerned, since it guarantees that totally different forms could NOT appear by its help, but only by reason of some force *that runs counter to its operation.* In short, syste-

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[1] *Membres et Ceintures des Vertébrés Tétrapodes*, 1924, pp. 395, 421, etc.

[2] *On Growth and Form*, 1942, pp. 1093–4, etc.

[3] " (So) far as concerns the major groups of animals, the creationists seem to have the better of the argument. There is not the slightest evidence that any one of the major groups arose from any other " (Austin H. Clarke : Art " Animal Evolution " in *Quarterly Review of Biology*, Vol. III, 1928, p. 539).

matic materialism goes by the board, at all the most critical points, and our anti-teleologist is driven to the wildest speculation. Either, like J. B. S. Haldane, he talks[1] of the Struggle for Existence *easing off*, Natural Selection *slackening* (note how he bows his own agent out of doors!), and a supposed "orgy of variations" producing the astounding new types—with all their marvellous correlations and perfections—by sheer chance; or, like Julian S. Huxley,[2] he talks vaguely about "preadaptations" effecting the required miracle.

As for Haldane's suggestion, it would be as rational to suggest that Shakespeare's plays were produced by an earthquake in a printer's office; and Huxley's device is equally ingenuous, since it pretends to explain a process by simply giving it a name. And what is this talk of "preadaptation," in any case, but a virtual surrender to teleology? As well might one talk of a casting having the shape of the mould before entering it. The bankruptcy of materialism, and the folly of its advocates, could hardly be more obvious.

Thus the first and second desiderata of materialism are completely negatived by the facts. There is no perfect gradation between structures for very different purposes, and never could have been any; much less could there ever have been survival value for each successive step in such gradation. The very reverse is the case.

In this brief review of the facts, much has to be passed by; but it is obvious, as first-rate naturalists have pointed out in criticising Darwin's materialism, that many problems exist which no materialistic system could even hope to explain. Take, for instance, the case of the new-born kangaroo. It is only an inch long and unable to suck; so its mother has an adaptation of the *cremaster* muscle which enables her to squirt milk down its throat; while, to prevent this choking the infant, the latter has *at that stage* a particular adaptation to prevent the milk going down the wrong way. As Owen pointed out: "The parts of this apparatus cannot have produced one another; one part is in

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[1] *The Causes of Evolution*, pp. 104–5.

[2] In reviewing G. G. Simpson's *Tempo and Mode in Evolution* (1944), Dr. J. S. Huxley admits that "no fossils have been found bridging the gaps between orders; and this phenomenon is virtually universal"; so he welcomes Dr. Simpson's suggestion that evolution "may in occasional cases be preadaptive" (*Nature*, July 7, 1945, p. 4).

the mother, another part in the young; without their harmony they could not be effective; but nothing except design can operate to make them harmonise."

Even A. R. Wallace, the co-inventor with Darwin of the theory of Natural Selection, realised its drastic limitations, and wrote: "What we absolutely require and must postulate is a Mind far higher, greater, more powerful than any of the fragmentary minds we see around us—a Mind . . . . which is itself the source . . . . of the more fundamental forces of the whole material universe" (*The World of Life*, p. 338).

When we pass to the third requirement of the materialist's case—that there should be no useless features in organic structures, since the existence of such would be a severe reflection on the efficiency of his supposed agent of evolution—it is amusing to see how the vast majority of evolutionists, being an essentially irrational mob, fasten with delight on every suggestion of useless and even noxious features appearing in organisms, as if such features proved evolution and disproved creation—while the reverse is actually the case. The TWO OPPOSED FACTORS of Genesis i–iii allow of the most noxious features appearing alongside the most perfect; whereas a supposed blind agent of perfection, like Natural Selection, is sadly disparaged by every imperfection. Writers like Darwin, Haeckel, Clodd and others in the past, and Watson, the Wells's and Julian Huxley in the present, exultingly talk of "useless rudiments," little realising the suicidal nature of their claim. Only the clearer thinkers, like T. H. Huxley, P. C. Mitchell and E. S. Goodrich have had some inkling of the boomerang qualities of this plea, and taken the opposite line of insisting on uses for these so-called "rudiments", in order to save the credit of their supposed agent of evolution.

As a believer in special Creation, I have looked for the useless in nature just as keenly as Haeckel did—but with the opposite view of its significance; and I hold that some vestigial features, by their very nature, testify to the doctrine of the Curse. Consider, for instance, the teats of male mammals. All male mammals (except Monotremata) have them; whatever the order, family, genus or species of the individual concerned. In every case, the male has the same number and arrangement of teats as the corresponding female. And the teats in man, as Darwin remarked, are as fresh as those in any other creature. His remarks are worth noting: "The mammary glands and nipples,

as they exist in male mammals, can indeed hardly be called rudimentary; they are merely not fully developed and not functionally active . . . . They often secrete a few drops of milk at birth and at puberty . . . . In man and some other male mammals these organs have been known occasionally to become so well developed during maturity as to yield a fair supply of milk" (*Descent of Man*, 2nd ed., p. 252). And yet even in the lowest mammals, the Monotremata, which "have the proper milk-secreting glands with orifices, but no nipples," the female alone suckles the young (p. 250). Darwin was driven to suppose that "long after the progenitors of the whole mammalian class had ceased to be androgynous, both sexes yielded milk, and thus nourished their young,"[1] and he went on to give instances showing how, throughout nature, one finds cases of the male parent assisting—sometimes taking the main part—in hatching or otherwise tending the young (pp. 251, ff.). How, then, are we to explain the relatively recent and universal stoppage of this custom of suckling by the males, throughout the class Mammalia, whether with or without teats? Darwin never attempted to explain the stoppage, which he indicated as implied by the facts; and so colossal an event, universally affecting every species throughout the class after all its present subdivisions had been established, is one which would have taxed the ingenuity even of that tireless speculator to explain on naturalistic lines. But does the Bible doctrine of the Curse not fit the facts? Why should not male mammals, in an uncursed world, have been physically and physiologically capable of assisting in nursing their young? It is easy to see how, under the Curse, the male would be specialised for fighting, etc., to defend the family, while the entire office of early feeding the family fell on the female (whose enhanced trouble over procreation is specially mentioned in the Curse).

Think, also, of thorns,—specially mentioned as typifying the Curse, and as crowning our Divine Lord when He bore our Curse on the cross. For thorns are undoubted abortions. As spines,

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[1] He thus suggests that the earliest mammals were androgynous; although reptiles (not to mention amphibians, and even fishes), from which they are supposed to be descended, are not. This is typical of his fuddled thinking. On his own theory, mammals could never have been androgynous; and yet since male reptiles have no teats—nor even mammary glands—male mammals could only have acquired them in order to use them. But in no species, throughout the whole class, can mammals use them today. No wonder that T. H. Huxley cited the case of male teats as peculiarly hard to explain on Darwinian lines ("The Genealogy of Animals," in *The Academy*, 1869).

they are vestigial branches or leaves; as prickles,[1] they are altered epidermal hairs, etc. Yet they are no shapeless or feeble objects, like rotten twigs or withered leaves, but highly effective daggers and claws. The spine is often, in the east, robust enough to pierce the sole of a sandal or shoe; and nothing could be more purposive than the briery prickle, well defined by its hard and glossy surface, from its elongated base to its sharply pointed tip, curved *downwards* in the longer axis of that base—thus inevitably seizing, and retaining or tearing, any passing object. That such deliberately, and (it would seem) profitlessly offensive structures should be independently produced by many different species in all parts of the world, is extremely difficult for the materialist to explain. The savage thorn, like the rudimentary teat, is far better accounted for by Moses than by Darwin.

And now as to the last Darwinian requirement here considered—that no structure in any one species should be of use solely to members of another species—it is clear that this also is contradicted by nature. Thus, Karl Frank points out that the plant *Duvana dependens* provides a special gall to cherish the moth *Cecidosis eremita*, shaping a cover of "precisely" the right size "at the right time, not earlier and not later, so that when the moth creeps out of the gall the chrysalis skin and that alone is torn off." As Frank asks: "What need is there for the plant to keep and cherish a moth, since it only does so by a constant expenditure of nutrition?" (*Theory of Evolution*, pp. 232–233). That question still seems to be unanswered. Yet, as we saw, Darwin said that even one such instance would "annihilate" his theory.

3. Inorganic Adjustments.

When we turn to inorganic nature, the problem is rather different. Here is no question of arriving at results by struggle and selection. Data are relatively permanent, on any showing; and so the question of their adjustments to suit the living creature has to be considered on other lines.

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[1] Scripture refers to both prickles and spines as thorns, often mentioning briers and brambles in this connection. The Hebrew term used in Gen. iii, 18 (and in the parallel Hosea ix, 8) is *qots*. Its application is obviously broad, for other terms as well as itself are used in reference to particular structures. Thus, the term *sir*, or hook, obviously indicates the prickle, etc.

It is impossible, in short space, to deal adequately with this very large question. I have discussed it in the first five chapters of my book *The Bible and Modern Science*; and a more extensive treatment of it appears in Dr. R. E. D. Clark's excellent work *The Universe and God*. We can only consider a few of the main points here.

As Dr. Clark points out, the advance of modern science—real science, which deals with the verifiable present instead of the hypothetical remote past—shows how extraordinarily intricate are the physical adjustments required to permit the existence of organic life in a universe like ours; especially if the organisms are to be of such high types as are found in our animal creation. Among the chief of these desiderata we may mention (1) a world of similar size to ours, within quite narrow limits; (2) its similar constant distance, within narrow limits, from a source of heat-bearing light similar to our sun; and (3) a similar bulk of water, and distribution of land and water over its surface. There are also many other essentials, such as the peculiar properties of carbon compounds, on which the very existence of complex organic structures depends, and the peculiar properties of water which so wonderfully subserve the needs of that existence; but these, although so significant, are the same throughout space—and it is only in our own minute fraction of space that the detailed adjustments seem to be found which make that existence possible. Even our solar system is unique; there being probably not another like it in the universe, despite the unthinkable numbers of the stars.

On these central facts we must concentrate here, because—as Dr. Clark so well insists—the essentials for organic existence were not appreciated in ancient times; and it was quite reasonably supposed, until quite recent years, that life might exist on countless other worlds—and even on the sun itself! We have now much more reason to regard our world, although utterly insignificant in size by comparison with the rest of our stupendous universe (as sceptics are careful to insist), as being incomparably the most significant part of the universe with regard to its contents, which alone include organic beings capable of appreciating and studying the rest of that universe. In short, we return—in transcendent form—to a geocentric concept of the universe. So the question arises as to whether the unique fitness of our earth, as the scene of organised existence, is due to design or chance.

The sceptic no doubt relies on the theory of chance, pleading the unthinkable number of the stars as a justification. But it distinctly weakens his case when we find that our solar system also appears to be unique; for countless such systems would have to exist before we could attribute to chance just such a luminary as ours at its centre, with an earth of similar size to ours at similar distance from it, and with similar ocean basins giving similar proportions of land and sea areas. The appeal to chance wears rather thin.

Again: As I try to point out in my book, it is a remarkable fact that, thousands of years before the importance of these particular desiderata was recognised by human science, it was indicated in the Bible as a fact which wisdom would appreciate. Incidentally, while ancient astronomers (*e.g.*, Hipparchus in 150 B.C., and Ptolemy in 150 A.D.) estimated the total number of the stars at only about 3,000, the Bible had already, many centuries before, indicated the truth by bracketing the stars, for unthinkable numbers, with the sand by the seashore (Gen. xxii, 17), and declared that "the host of heaven *cannot be numbered*" (Jer. xxxiii, 22). Modern scientists have taken to using similar expressions, Sir J. Jeans saying that "There must be more stars in the sky than there are blades of grass on the whole surface of the earth" (*Listener*, Oct. 8, 1942, p. 454).

The significance of the size of the earth is indicated in Job xxxviii, 5, where the Almighty is represented as drawing the patriarch's attention to the fact that the earth has certain dimensions, and asking him who settled them: "Who determined the measures thereof, if thou knowest? Or who stretched the line upon it?" (R.V.). The picture is that of one who saw that the earth should have certain dimensions, neither more nor less; the implication being that this particular size was a matter of importance. And modern scientists have learnt to appreciate some of that importance; thus we find a meteorologist like Douglas Archibald saying: "The fact, therefore, that we possess at the present time a gaseous atmosphere of exactly that particular degree of tenuity that suits our breathing apparatus, remarkable though it may seem, is a direct consequence of the particular size of the globe on which we stand" (*The Atmosphere*, pp. 12–13). This is only one of the beneficial consequences of that particular size; some others will be seen indicated in my book and still more in Dr. Clark's.

The importance of the position of the earth is clearly indicated in Job ix, 6, which classes it as a major judgment of God that the earth should be shaken " out of her place." Fools have ridiculed this passage ; yet the philosopher Locke, who knew all that they know about astronomical facts, endorsed its significance, saying that : " Were this earth removed but a small . . . . distance out of its present situation . . . . the greatest part of the animals in it would immediately perish " (*Essay*, Bk. iv, c. 6, s. 11).

As regards the third of our principal desiderata, I would refer to the passage where it is said, as showing God's understanding of " wisdom," that :

> " He looketh to the ends of the earth,
> And seeth under the whole heaven,
> To make the weight for the winds ;
> And He weigheth the waters by measure "
>
> (Job xxviii, 24–25).

This is typical of the way in which ancient Scripture embodies advanced appreciation of scientific facts in cryptic terms which amuse the foolish, comfort the simple, and awe the wise. For if, instead of brushing the above passage aside, we look into it, we may note that " the ends of the earth " suggests the two poles, or ends of its axis of rotation ; while " under the whole heaven " must mean the whole surface of the earth (everything above that surface being *in* the external heaven). Now these factors are truly related to what follows. For the distance between the poles gives the diameter of the earth, and hence its mass, which determines the amounts of air and water held to its surface ; while the extent and shape of that surface determine both the consequent atmospheric weight at any point on it, and also the amount of water to be specially stored to give adequate land area.

So note that the origin of our abrupt and colossal ocean basins is one of the greatest enigmas of modern physics ; while the exact adjustment of the size of those basins to the total amount of water in them astounded A. R. Wallace (the bulk of the water in the basins being no less than *thirteen times* the bulk of the land which rises above their surface). Pointing out that if the amount of water were only 10 per cent. more, or the capacity of the basins 10 per cent. less, most of our present land surface would be submerged and the possibilities of life on land greatly reduced, Wallace remarks in perplexity " How the adjustments

occurred, it is difficult to imagine. Yet the adjustment stares us in the face" (*Man's Place in the Universe*, p. 217). What more striking comment could we have on the above passage, and on the parallel Scripture statements that God "measured the waters in the hollow of His hand" (Is. xl, 12), and "layeth up the deep in storehouses" (Ps. xxxiii, 7) ?[1]

We may also note that striking talk of making *weight for winds*. Its significance could hardly have been appreciated at the time, or even when this passage was translated into our present A.V. English (1611); for *it was not until* 1648 *that scientists discovered that the atmosphere has weight*—and so learned the secret of wind action. It is because the atmosphere has weight (a fact which even Galileo did not know, for it was discovered by Blaise Pascal) that differential heating causes differences in weight, bulk for bulk, between adjoining parts of the atmosphere, and consequent movements between them, the heavier air passing under the lighter. Weight is thus essential "for" winds, just as here indicated; and the greater the normal atmospheric pressure, the greater will be the force of winds due to differential heating. Significantly, therefore, the weight "for" winds is correlated with the size and surface area of the earth. But who taught the ancient writer to indicate that correlation ?

Conclusion.

Limits of space prevent our discussing this matter more fully; but perhaps enough has been said to indicate the aptness with which Scripture meets the ethical issue, indicating two opposed factors—perfect Creation and universal Curse—which exactly suit the seeming anomalies found in nature. We have also seen something of the way in which the facts of organic nature flatly oppose all the requirements of any materialistic explanation of the same, while definitely endorsing the Biblical explanation.

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[1] Many authorities regard these abrupt and deep basins as being due to the tearing out of great masses of lighter surface rocks (the "sial" of Suess) to form our unique satellite, the moon; the remaining sial floating on the relatively heavier, more viscous and more basic "sima" to form our continents. But how (on this theory) was just the right amount of sial removed to afford exactly suitable accommodation for the ocean waters ? For the equivalent weight of sima would rise to replace the sial; and, on the same principle of isostasy, the *weight* of the waters would have to be considered (just as Scripture implies) when allowing for their *measure*, owing to the viscosity of the sima.

And we have noted something of the uniqueness of our earth in regard to its size, its setting, and its extraordinary ocean basins, as specially suited to support a highly organised animal population; and seen how the Bible indicated the importance of these adjustments long before human science was in a position to appreciate them.

It is modern science, in the truest sense, which has brought out all these points; so we may well claim that the case for teleology has progressively increased in strength, despite all the efforts of materialistic philosophers to decry it.

Written Communications.

Mr. Douglas Dewar wrote: In his most valuable paper Col. Davies says many things which greatly need to be said, since they are so commonly overlooked. It seems to me that his paper should be entitled "the Rightful Status of Teleology" rather than "The Present Status," because it shows that the position of Teleology is impregnable and no other theory can replace it. Dr. Davies is not responsible for the title, because the Council asked him to write under this title. When I suggested that the paper should be written I had in mind the somersault made by biological opinion during the past 90 years. In 1857 McCosh and Dickie expressed (*Typical Forms and Special Ends in Creation*, p. 30) in the following words the views which had been held by men of science for centuries: "Order is Heaven's first law, and the second is like unto it, that everything serves an end. This is the sum of all Science. These are the two mites, even all that she throws into the treasury of the Lord." The first of these the authors designated Cosmology, The Science of the Order in the Universe, and the second had already been given the name Teleology, the Science of Special Ends.

Then Darwin came along and turned biological opinion topsy turvy by substituting for the above basis the proposition that natural phenomena are the result of the action of blind forces. This was eagerly accepted by the majority of biologists, and, as early as 1869, T. H. Huxley wrote in *The Academy*: "The Teleology which supposes that the eye such as we see it in man, or one of the higher vertebrata was made with the precise structure it exhibits for the purpose of enabling the animal which possesses it to see, has undoubtedly received its death blow."

Thus was inaugurated what Arnold has well called " The Flight from Reason " of biologists. In the last decade of last century the number of biologists who did not participate in this flight could have been counted on the fingers of the two hands. Thanks to the few who refused to be stampeded, a reaction set in early in the present century, and the view that " everything in nature serves an end " is a scientific law, began to gain ground. Teleology is now rapidly recovering its rightful status. The great biological somersault is nearly complete. A number of biologists now realise that biological facts cannot be explained by means only of mechanical conceptions and that teleology in some form or another must be admitted. A few to-day still cling to the ideas that prevailed in the latter part of the 19th Century, such as Prof. D. M. S. Watson and Dr. Julian Huxley. Col. Davies has dealt with Prof. Watson. Dr. Julian Huxley has been compelled to adopt what he styles " a scientific pseudo-teleology " (*Rationalist Annual* [1946], p. 87). " Natural Selection," he writes, " is a mechanism for introducing apparent purpose in nature. After Darwin it was no longer necessary to deduce the existence of divine purpose for the facts of biological adaptation. Instead of *conscious purpose* we can now say *adaptive function*, and the old theological teleology can be replaced by a scientific pseudo-teleology . . . . . Natural Selection is able to accomplish simultaneously two apparently contradictory results—it can both discourage and encourage change . . . . . We have this glorious paradox that this purposeless mechanism, after a thousand million years of its blind and automatic operations, has finally generated purpose—as one of the attributes of our own species."

The credulity of Dr. Julian Huxley appears to have no limits. Another rationalist, Prof. J. B. S. Haldane, admits that there is much to be said for Paley's argument for design, but, pointing to what he deems to be useless, harmful or defective structures in animals, he contends that the designer cannot be both omnipotent and perfectly good. Indeed, when arguing with Arnold Lunn, he goes so far as to say (*Science and the Supernatural*, p. 140): " no respectable telescopemaker would make a series of instruments with so many optical defects as a group of human eyes taken at random." To this argument Col. Davies' paper makes a most effective reply, in that it shows that the third chapter of Genesis provides the essential means

of reconciling the deplorable state of nature as found to-day with the ideal state resulting from God's works described in the first two chapters. Davies also points out that the existence of useless or harmful structures, while explained by the third chapter of Genesis, is a formidable objection to those who regard Natural Selection as ever on the look-out for, and destroying, every useless or harmful structure. It is, of course, possible for the materialist to counter this to some extent by contending that harmful structures may be correlated with or linked to highly useful ones, and that on the balance the combination is beneficial. But this has not been proved.

While agreeing with Davies that the existence of useless structures is not inconsistent with the statements in the first three chapters of Genesis, I am inclined to think that the only structures which are not of use to their possessor at some stage of existence are a few which Vialleton calls embryonic remains, *i.e.*, the consequences of the way in which embryos develop. Every fertilised ovum is endowed at an early stage with the tissue-producing cells or primordia of each of the major structures or organs that occur in any member of a group or class of animals, even of those which some species do not need. These do not develop fully unless subjected to successive stimuli provided by the embryo whenever required. If any of these organs be not needed by the species, either these stimuli are withheld or other stimuli develop which counteract them. Thus, at an early stage the embryo of every individual possesses the primordia of both male and female structures, but in the embryos which will develop into males the only stimuli which operate are those which cause the male primordia to develop completely. Those which stimulate the primordia which give rise to female structures are inhibited, with the result that the male ordinarily does not develop milk glands, but only the rudiments of these. In this way the nipples on the adult male are formed. In this connection we must bear in mind the existence of the organ of Rosenmüller in the adult female.

Watson and Huxley are part of a small minority of modern biologists. The vast majority recognise that a teleological explanation of the phenomena is unavoidable. One has but to read such recent books as *God's Masterpiece. Man's Body* by Arthur I. Brown (1946), or *The Directiveness of Organic Activities*, by E. S. Russell (1946), to see that there are in the bodies of both man and

the animals scores of activities which can only be accounted for as being designed. Brown frankly writes (p. 188) that in everyone of these in man's body " we can easily see an omniscient planning by a Supreme Intelligence." Russell, on the other hand, seems unable to rid himself of the ideas on which he was nurtured, and to be enveloped in a dense mental fog, for he writes (p. 176): " Instead of attempting to explain the ' teleological ' nature of organic activities in terms of concepts derived from man's knowledge of his own purposive activity, as do the mechanist and the vitalist, we should take precisely the opposite view, and regard human purposive activities (including machine-making) and modes of thought as being a specialised development of the fundamental ' purposiveness,' or as I prefer to call it, the directiveness and creativeness of life. If this be, as I maintain, the right view to take, then we must accept the ' teleological ' nature of vital activities as something given and fundamental, not to be explained in terms either of physico-chemical action or of purpose."

Mr. W. F. SPANNER wrote: We are under a deep debt to Lt.-Col. Davies for this valuable paper and I should like to thank him for it.

I agree with Col. Davies that Scripture calls the existence of God as God obvious to all but the mentally defective. There appear to be at least three reasons for this. Firstly, all men have an inward sense of the divine or as Calvin puts it (*Institutes*, Vol. I, Ch. iii): " The human mind, even by natural instinct, possesses some sense of a Deity." He quotes Cicero (who did not enjoy the light of the Christian revelation) as follows: " No nation is so barbarous, no race so savage, as not to be firmly persuaded of the being of God." The accumulation of modern knowledge has not weakened the evidence which establishes this point but has rather strengthened it. Nations which have abandoned Christianity have had to find substitute religions and thus has arisen the modern worship of the superman in Germany, Italy, and Russia. Dr. Julian Huxley appears to be thinking in terms of a " planned religion." " Insofar as religion means spiritual welfare," he says, " we ought to be able to apply to it the same methods of unified survey and later of unified planning that are now beginning to bear fruit in the field of

economic and social welfare" (*Rationalist Annual*, 1945). To fill the vacuum caused by the rejection of Christianity a "planned religion" is to be substituted. This at least presupposes the existence of "spiritual needs" in mankind; and to what are these due if not to the latent "sense of Deity" possessed by the unregenerate human mind?

Secondly, the knowledge of God is evident from the creation of the world. The learned author has adduced powerful evidence to support this, and in spite of all that has been argued by evolutionists and agnostics the question presses itself upon every thinking mind, How did the universe originate? Even the acceptance of the evolutionary view (and it has to be remembered that some Christians have accepted this view) does not solve this problem, for a further question presents itself. How did the universe acquire the marvellous property of evolving from itself the most diverse and wonderful forms of life? Surely there must have been a God to create this remarkable evolutionary universe. Some have sought refuge from this dilemma in pantheism, which is a very popular present-day philosophy. Unfortunately for this view, the physical facts as we know them are opposed to it. The second law of thermodynamics (to take one example) compels us to the conclusion that the universe is like a clock running down. And as Dean Inge pungently remarks (about the pantheistic view of the universe): "A God under sentence of death is no God at all" (Dean Inge on *Protestantism*). The argument from creation is as powerful as ever. I will add a few further remarks to what Col. Davies has said about the material evidence for design which is truly remarkable. Think of two substances which we are able to prepare, steel and chloroform. How came there to be two such substances? Is this not a clear evidence of the provision made by a beneficient Creator for his creatures? Without steel there would be no motor cars, no steam ships, no aeroplanes—in fact one would be safe in saying that our modern civilisation could not exist. Again consider the merciful properties of the substance called chloroform introduced into medicine by Simpson in 1847. Is this not a singular instance of the beneficence of the Creator? We are reminded of the Psalmist's words: "The works of the Lord are great, sought out of all them that have pleasure therein" (Ps. cxi, 2). The third evidence by

which all men have some perception of the existence of God is to be found in God's works of providence which are always marked by a discriminating justice. Is it by accident that the misuse of the sacred powers of reproduction which God has bestowed on men and women is so often attended by horrible diseases? Is it by accident that Germany, the home of the destructive criticism of the Bible, has suffered the most terrible fate that has ever befallen a great nation inside the body of Christendom? These facts must not be brought forward in a self-righteous way but must be observed that we may have a true fear of God. These are solemn and terrible things. It may be argued that there is much wickedness which appears to go unpunished in this world and also much that righteous men suffer. This is true. Calvin says on this point: "God so regulates his providence in the government of human society, that while he exhibits, in innumerable ways, his benignity and beneficence to all he likewise declares by evident and daily indications his clemency to the pious and his severity to the wicked and ungodly." The judgments of God which are thus so evident in the earth should lead us to consider the certainty of a future judgment when sins which now go unpunished will bring their final retribution (*Institutes*, Ch. v).

Mr. W. E. LESLIE wrote: Col. Davies holds that God could not, prior to the fall of man, have been responsible for certain "harsher facts of nature." Since some of these harsher facts go back to the earliest fossils it would follow that man is older than the oldest fossil deposits. Why, then, are his remains only found in very late deposits?

From the Biblical point of view the author's theory requires that much of the creative work (both benevolent and harsh) took place after the fall of man.

Would it not be simpler, and more modest, to enquire what God has in fact done, instead of laying down *a priori* what we consider He must have done, or not done?

The Rev. J. S. BAXTER wrote: Col. Davies has asked me to give some facts regarding the "doctrine of the curse" from the standpoint of historical Christian theology. That the vegetable and animal kingdoms were involved in the divine curse on fallen man has been uniformly held by all orthodox Jewish expositors. It is reaffirmed in the New Testament, and has been held by Christian

theologians right down from the ante-Nicene fathers to the present day. Those who do not accept it to-day are those who have accepted that German-originated brand of " higher criticism " which explains away the supernatural inspiration of the Bible. All who take the older view of the Bible accept the " doctrine of the curse," and would never attempt to explain the enigmas and problems of the present physical order on earth apart from it. The chairs of all evangelical theological colleges to-day would subscribe to this. To say, therefore, that this " doctrine of the curse " is a new invention or something peculiar to Col. Davies is absurdly wide of the mark.

Dr. L. R. WHEELER sent a lengthy communication of which the following is a summary :—

Some of Col. Davies' criticisms of materialism are admirable, but a number of points call for criticism.

Few theologians now take Genesis iii in a literal sense and to do so is, in fact, to present us with an idea of Nature fundamentally opposed to that of the Bible as a whole. The Psalms, notably civ, represent created things as attesting God's wisdom and goodness, and organisms rejoicing therein. Christ saw ravens and lilies as the reverse of accursed (Luk. xii, 24 seq.), etc. In view of these facts, it is difficult to believe that the entire creation has been cursed. And, in any case, we should observe that the talking snake was not the source of evil taught by Christ (Matt. xv, 19).

The view that previous creations were destroyed wholesale has long been rejected by scientists. It is difficult to see how, if these events had really occurred, it would now be possible to find an argument for teleology in Nature. Again, Col. Davies apparently believes that " the whole existing world of life " was created in six literal days. But some of these days are allocated solely for the creation of light, the firmament, and the heavenly bodies. Were these, too, created many times over ? If not, why is re-creation suggested for the organisms made on the other days.

Well-known modifications of plants which are clearly for their good, such as spines for leaves in cacti, branches reduced to thorns in bushes, and hooks or prickles developed for climbing or seed-dispersal—are ascribed by Col. Davies to the effects of the curse.

Surely this view is unreasonable. A book published in 1851 is quoted for ascribing the noxious properties of thistles to the abortion of their calyces; but *Cnicus arvensis* is troublesome because it spreads mainly by underground rhizomes.

Col. Davies seems to ignore the prime factor in the life of all organisms—reproduction. Reproduction is expressly mentioned in Genesis i and Darwin's famous statement of *potential* multiplication by any species till its descendants filled the world is surely correct. This being the case, death, as Paley observed earlier, is necessary to balance birth and there is no need to regard it as essentially evil. Indeed, predators do much to maintain the wonderful harmony of Nature. Col. Davies seems to accept the theory of Haeckel and similar writers who could only see unrelieved struggle in Nature; but in opposition to this, innumerable facts show that co-operation rather than struggle is the main principle of organic existence. (See the writings of Drummond, Kropotkin, Allee, etc.; also my forthcoming book *Harmony of Nature*, 1948 (E. Arnold).

The richness of the marine remains in the Cambrian rocks is indeed an argument for creation; similarly the absence of connecting fossils between the large groups of organisms is an argument for large, later, creative mutations. But there is also abundant evidence for what scientists call evolution within such groups as orders, families and genera. To-day, it is generally accepted by the neo-Darwinians that small mutations, comparable to the small changes which Darwin envisaged, are sufficient to explain evolution at least within these narrow limits. Col. Davies seems to ignore this modern point of view.

The statement that Galileo did not know that air has weight is wrong. Cajori shows that he did (*History of Physics*, 1929, p. 71).

AUTHOR'S REPLY.

I thank Mr. Dewar and Mr. Spanner for their kind remarks. As regards the suggested explanation of sexual rudiments; I think that this may well apply to some other features, but not to male teats. For the sex of the human embryo becomes apparent during the second month of its existence, while its mammæ appear later. It seems significant that male mammæ not only *develop after the sex is determined*, but also continue to the end in almost functioning condition—as Darwin himself remarked.

As regards the alleged defects of the human eye: it is worth remembering that Helmholtz himself, though so often cited as emphasising them (*Vorträge und Reden*, i, 253, etc.), showed that they do not affect the serviceability of the eye, which might be less practically useful if more theoretically perfect. He said that probably 'any elaboration of the optical structure of the eye would have rendered it more liable to injury,' so that the eye is a thing which 'the wisest Wisdom may have designed.' It is not the marvellously intricate and suitable eye, but the bothersome appendix that I would refer to the Curse, contrasting the one with the other as exemplifying the Two Opposed Factors mentioned in Gen. i, 3, and found in nature.

Mr. Leslie's point is not very clear; but if he thinks that creations prior to man could not have been cursed, that is his own *a priori* assumption, for which he will find no support in my writings.

I welcome his closing suggestion, and hope that he will now begin to act on it by reading Gen. iii. He will there find that, even in our own creation, the brute fell before man fell, and was cursed before man was cursed.

I thank Mr. Sidlow Baxter for his valuable note.

Lt.-Col. Davies also sent a reply to the comments by Dr. Wheeler, of which the following is a summary:—

Though he rejects my literal interpretation of the six days of Genesis, Dr. Wheeler does not attempt to answer my arguments. As for Gen. iii, while it is true that most modern theologians do not take the passage literally, it is important to note that the literal interpretation was accepted by the whole Christian Church until quite recent times—a fact confirmed to me by Prof. G. T. Thomson of the Chair of Theology of the University of Edinburgh. Cruden (1701–1770) expressed 18th century orthodoxy when he wrote: "God pronounced his curse against the serpent which seduced Eve, and against the earth, which henceforth was to produce briars and thorns . . . He [Adam] enjoyed nature in its original purity . . . before it was blasted with the curse. The world was . . .not as it is since the fall, disordered and deformed in many parts . . . By the fall of man all the powers of nature were depraved, polluted and corrupted" (*Concordance*). It is clear, therefore, that the view I put forward is by no means novel.

I cannot assent to Dr. Wheeler's view of the general teaching of the Bible with regard to the curse. Psalm civ, for example, far from speaking only of God's goodness, actually suggests the doctrine of special creations to which Dr. Wheeler takes exception. Thus it speaks of God hiding His face, of the animal creation being troubled and perishing and then of God sending forth His Spirit, creating a fresh population and renewing the face of the earth. This clearly recalls Gen. i, 2 ff. While it is true that our Lord cited the lilies as types of the beautiful in nature; it is also true that he called evil men vipers because of their noxious qualities (Matt. xxiii, 33). The Bible repeatedly cites thorns, briars, nettles and thistles as matters for lamentation and evidences of ruin and judgment (Is. xxxii, 12–13; xxxiv, 13; Hos. x, 8; Heb. vi, 8, etc.). Again, it is not true that our Lord ignored Satan's part in seduction, for he spoke of the Devil's murderous lie as operating "from the beginning" (John viii, 44). Paul, like our Lord, accepted the literal details of the temptation account (1 Tim. ii, 14). Paul also flatly contradicts the view that everything in the world of nature is as it should be (Rom. viii, 18–23), while the prophecies of conditions when the curse is removed (Is. xi, 6–9, etc.) show what God calls "very good" (Gen. i, 31).

Dr. Wheeler asks whether light, the firmament and the heavenly bodies were created many times over. This is not necessary to my view as I have already shown in my book, to which reference may be made. It should be noted that, in my view, the grounds on which a belief in separate creations was generally abandoned were philosophical rather than scientific.

I am not clear as to the relevance of Dr. Wheeler's comments on evolution. I was discussing the essentials for an *atheistic* explanation of nature. If teleology is to be ruled out, infinitesimal links must be shown to have connected all structures, with survival value for each link over the last. Neither Darwin nor the neo-Darwinians have satisfied this demand. Nor does Dr. Wheeler's belief in exceedingly great mutations appear to me to be relevant. It seems to be contradicted by Genesis i which speaks of living creatures bringing forth "after their kind." Dr. Wheeler is unjustified in explaining away the evidences of the curse in nature. To say that thorns, etc., were developed "for the good of the plants in their natural environment" explains nothing—since the need for such

adaptations only shows that the environment is hostile. Dr. Wheeler quotes Paley for the idea that carnivores are necessary checks on population. But this is theory, not proved fact; the actual checks on population being "most obscure" as Darwin himself admitted (*Origin of Species*, Chap. III). Thus, although "no growl of beast of prey" has been heard there, the Galapagos Islands are not overcrowded, and their "wild" fauna has been astonishingly tame for centuries (*cf.* Prof. J. Ritchie, *Edin. Univ. Jour.*, 1943, xii, pp. 95–105). Such facts cannot be ignored.

As for plants, prickles are rarely advantageous—they entangle plants with their neighbours, to their mutual disadvantage; or catch and tear passing animals to the detriment of both beast and plant. If some thistles make a nuisance of themselves by adaptations other than prickles, the point is unaffected. In any case Balfour (*op. cit.*, pp. 145–6) says: "The injury which thistles and plants like them, cause . . . is . . . owing to the mode in which the fruit is scattered by the winds, and this altered hairy calyx is the means employed for doing so." Prickles are similarly alternative to thorns and the python's strangle grip is alternative to the viper's elaborate poison fangs.

Dr. Wheeler is wrong in asserting that I refuse to recognise co-operation in nature. I emphatically do so and expressly claim instances of it as proving beneficent creation. Genesis, however, also tells us of another opposing factor in nature and it is this which Dr. Wheeler apparently ignores.

The doctrine of the curse certainly does seem terrific to our minds. But how can we, living in sin, judge our own deserts? It is not the persons sitting in a closed room who realise the state of their atmosphere, but the visitor from outside who makes startling and seemingly excessive remarks about it. So the very shock given to fallen man, by the doctrine of the curse, bespeaks its eternal source.

Dr. Wheeler is right about Galileo who, did, apparently, finally realise that the air has weight. But Cajori confirms that he did not deduce atmospheric pressure from atmospheric weight. It is to Pascal (1648) that we owe the discovery that the atmosphere acts like a fluid, exerting pressure in all directions and so confirming the truth of Job's expression—"weight for winds."

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IMMORTALITY.

By Rev. G. R. Beasley-Murray, M.Th.

IN no other sphere of thought is the infinite superiority of Christianity over all other religions and philosophies so clearly demonstrable as in the concept of immortality. Paul claimed that Jesus Christ "annulled death and brought life and immortality to light through the gospel" (2 Tim. 1, 10). His statement suggests that, apart from Christ, man is still comparatively in the dark as to this, his most persistent enquiry of the ages; he has hopes and intuitions but neither the means of confirming them nor the knowledge of how to attain to their fulfilment. It is claimed that Christ replaces hope by assurance, speculation by revelation, yearning by actuality of possession. It is a stupendous claim which, for its verification, needs to be examined not only on its own merits but in comparison with the thought of the rest of mankind.

It needs hardly to be stated that philosophy finds itself peculiarly handicapped in this realm. The elusive nature of the data on which it has to proceed, and the large place inevitably occupied by presuppositions as to the nature of reality, have caused constant fluctuations in the conclusions arrived at by various scholars. T. H. Huxley made a confession in this respect which contains much truth. "Relatively to myself," he wrote, "I am quite sure that the region of uncertainty—the nebulous country in which words play the part of realities—is far more extensive than I could wish. Materialism and Idealism; Theism and Atheism; the doctrine of the soul and its mortality or immortality—appear in the history of philosophy like the shades of Scandinavian heroes, eternally slaying one another, and eternally coming to life again in a metaphysical 'Nifelheim'." It is getting on for twenty-five centuries at least since mankind

began seriously to give their minds to these topics. Generation after generation, philosphy has been doomed to roll the stone uphill, and, just as all the world swore it was at the top, down it has rolled to the bottom again."[1] Professor Huxley did not make it clear as to what mode of thought he conceived to be represented by the top of the hill, but nowadays the inclination is to stop half way. Many are agreed that there is much to be said in favour of the truth of immortality. The fact of our being potential rather than actual personalities, with its suggestion of another realm of existence wherein our unexhausted potentialities come to full development; the seeming absoluteness of the moral law, which is meaningless without persons living in relation to it; the universal desire of mankind for immortality, so universal as almost to seem a primary instinct, which, on the analogy of physical life, postulates a reality corresponding to that want; the difficulty of conceiving the cessation of thought and therefore of personal consciousness which gives rise to it; all these considerations tend in one direction and give various degrees of satisfaction according to one's individual bent; yet even the most enthusiastic advocates of these arguments admit that they fall short of proof. For immortality to be a compelling factor in this life, one needs stronger foundations than these on which to build.

The regard in which the testimony of the historic religions concerning immortality is held varies according to one's theological presuppositions. Certainly they reveal how persistently man has reached out after a satisfactory view of the after life, so that Professor Huxley's modest "twenty-five centuries" have to be increased to at least *sixty* centuries during which men have wrestled with this problem. Despite many assertions to the contrary, it appears to be incontrovertible that primitives generally believe in an immortality of some sort; every exception so far adduced has been found, on further investigation, to be no exception. But with regard to the ethnic religions, a curious phenomenon is observable in every case, viz., that such records as we have attest a more vivid expectation of immortality in the earliest periods than in the later times; in many cases there is considerable advance made on the basis of the early thought but as time goes on the purer elements and more vivid hopes become swamped by the official creed.

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[1] *Science and Christian Tradition*, pp. 312–313.

The oldest Vedic hymns show that the earliest Hindus believed immortality to be the gift of the gods; in some way this life was identified with the divine life and was conceived to be lived in the presence of the gods, in "that everlasting and imperishable world where there is eternal light and glory." But a complex sacerdotalism arose and developed into Brahmanism, with Buddhism as its offshoot. Instead of a desirable and developed life after death, the Buddhist goal became the extinction of desire in Nirvana, with a series of heavens and hells for the less fortunate folk and an interminable existence by transmigration. "This is the conclusion of Indian thought," writes Salmond. "Death is not man's end. He has a future, but of how dread an aspect! The early faith in an immortality with the gods, in which the individual continues to exist, disappears. For the mass of men the Future is one in which the soul passes from shape to shape, wears out body after body, and works out its retribution, in a hopeless struggle with its demerit, in a perpetual effort to burst the mesh of existence. For the select few it is a Future which means with the Buddhist the extinction of individuality in Nirvana, and with the Brahman the absorption of the individual soul in the Universal Soul."[1] So is India to-day.

Egyptian eschatology shows, in the earliest portions of the Book of the Dead, a cheerful expectation of life after death. The departed are called "the living"; only evil spirits have the name "the dead." The land of the dead was called "The Land of Knowledge," "The Concealer of the Resting." Although their ideas of the after life were very materialistic, so that their tombs in which the soul should live were conceived on the plan of their homes, the justified, nevertheless, had the universe open before them. They drank the water of life, they became spirits of light, shared in the glory of Osiris, and obtained perfection in the bosom of the sun; the wicked, on the other hand, suffered the "second death" in hell, though this did not involve annihilation. But the henotheism which lay at the root of Egyptian religion could not resist the incroaches of polytheism and zoolatry and hope faded, so that the land of the dead now became the land of darkness, sleep, and perpetual sorrow. Magical rites robbed immortality of its moral energy, and by the beginning of the Christian era the Egyptian faith had so far degenerated as to become an object of ridicule to heathen writers and abhorrent to the Christians.

[1] *Christian Doctrine of Immortality*, p. 36.

Greek thought prior to the days of Homer can only be conjectured from the traces of earlier animism in his writings and by inferences in those of others. In books 10–11 of the Odyssey there are to be seen survivals of ancestor worship; the shades have thought and will and action and enjoy blood offered to them. Hesiod tells how the men of the golden age became δαίμονες ἐπιχθόνιοι, watchers over mankind in a good sense; the men of the silver age became δαίμονες ὑποχθόνιοι, though not in Hades; but the men of the bronze age (Hesiod's own age) became εἴδωλα (phantoms) in Hades. In other words, earlier generations had great expectations as to their state in the after life, but by Hesiod's age nothing better was expected than the lifeless existence of the Greek Hades, such as Homer had made popular; it was a life in which the soul lost consciousness; it knows nothing of the upper world and cannot return to it; it is incapable either of anguish or affection. Despite the Dionysiac and Orphic cults and the teaching of Pythagoras and Plato, the Greek people generally never rose above the Homeric view. And though Plato's philosophy was noble, its fundamental postulates are foreign to us, involving as they did the *eternity* of the soul and the idea of transmigration; these notions made his system an "individualism run riot," as Charles described it, and kept it for the philosophic few.

The Persian religion is important for the student of eschatology, for it possesses the most developed system of thought on this subject of all ancient peoples, apart from the Jews. Their view of reality was essentially dualistic, but they believed the powers of good to be stronger than the powers of evil. They looked for a paradise with Ahura for the righteous, a hell with the Dævas for the wicked, and an intermediate state until the great Judgment for the "neutrals." Their view was thus truly moral. As this system developed, hope came to be placed on a deliverer, Shaoshyant, who was to effect the restoration of all things. The dead were to be raised to life; all would undergo purgatorial cleansing, resulting in salvation for all; by means of a final conflict, the evil powers were to be destroyed and the purged humanity enjoy a blessed immortality in a "kingdom of God" on a renewed earth. The parallels between this and the Biblical picture of the End are striking; yet this system went the way of the rest. Ceremonialism and casuistry reduced the future hope to an affair of offerings and the casting of spells; the moral elements in the hope of the future were dissipated and

buried beneath a mass of puerilities and absurdities. "The Parsis have been called the ruins of a people," wrote Salmond, "and their sacred books the ruins of a religion. The doctrine of the future which is taught in these remnants of the sacred books of Mazdaism is the ruins of an eschatology."[1]

The only other ancient people needing to be considered in this brief survey is the Babylonians, who had close contact with the Hebrews. They never proceeded far in speculation on immortality, but it is clear from their literary remains and from the discoveries of their tombs that the popular Babylonian hope of the after life was as vivid as that of most of their contemporaries. We see evidence of ancestor worship, spiritism, and the hope of continuing earthly occupations in the realm of the dead. But this early and widespread hope seems to have been extinguished by the official priesthood, who taught that Sheol was a land of darkness, covered with dust; conceived as a great city, the underworld was inhabited by dusty shades whose food was dust, whose drink was muddy water, who knew no love nor hate but only wailing and sorrow, whose only sound was moaning. Such was the hope of the people to whom Israel went in captivity.

The foregoing survey prepares us to find that something of the same process appears to have gone on among the Hebrews. It is to be remembered that Abraham came from Ur *of the Chaldees*; further, that the Biblical record makes it plain that the lofty teaching of Moses and the prophets was never wholeheartedly embraced by the mass of the people; that that teaching found the people perpetually under the influence of contemporaneous paganism and was continually fighting its influences. Hence we ought not to be surprised at finding evidences of beliefs irreconcilable with the prophetic revelation made known through Moses and the later prophets. Further still, it is to be remembered that that revelation itself was concerned largely with the affairs of this life and, in the realm of eschatology, with the destiny of the nations; individual immortality was not a major subject of revelation.

The earliest ideas of the Israelites seem to imply a clear conception of active life in the world of the beyond. A man on death went to his fathers (Gen.xxv, 8); that presumably implies a reconciliation with them. The many prohibitions against spiritism show that it must have been widely practised; we have,

[1] *Op. cit.*, p. 93.

of course, the very full narrative of the calling up of the departed Samuel by Saul (1 Sam. xviii, 13*f.*). Such a passage as Is. xiv, 9*f.* attests conscious activity on the part of the dead : " Sheol from beneath is moved for thee to meet thee at thy coming : it stirreth up the dead for thee, even all the chief ones of the earth ; it hath raised up from their thrones all the kings of the nations. All they shall answer and say unto thee, Art thou also become weak as we are ? Art thou become like unto us ? "

Yet alongside such representations as these we have to place, particularly from the later literature, expressions of utter pessimism with regard to the future life. Sheol is a place of silence ; " The dead praise not the Lord neither any that go down into silence " (Ps.cxv, 17). It is a land of slumber from which there is no recall ; " Man lieth down and riseth not : Till the heavens be no more, they shall not awake, nor be roused out of their sleep " (Job. xiv, 12). It is a place of unconsciousness ; " The dead know not anything, neither have they any more a reward . . . there is no work, nor device, nor knowledge, nor wisdom, in the grave " (Eccles. ix, 5 and 10). To one psalmist at least, therefore, death is cessation of existence ; " O spare me, that I may recover strength, before I go hence, and be no more " (Ps. xxxix, 13). In any case, it is a state in which there is no hope of contact with God ; the writer of Ps. lxxxviii felt he was " like the slain that lie in the grave, *whom Thou rememberest no more, and they are cut off from thy hand* " (v. 5).

The reason for this divergence of views is obscure ; Charles thinks it is due to the popularity in the prophetic era of the view of man which is set forth in Gen. ii, 3, according to which the principle of life in man is the impersonal spirit given by God, the withdrawal of that spirit being thought to cause cessation of individual existence.[1] Oesterley and Robinson are confident that it is due to the official teaching which set out to counteract the popular beliefs ; those beliefs had to be destroyed because they were bound up with practices contrary to the worship of Jehovah.[2] Whatever the reason, it seems to have been part of the providence of God, for the early beliefs, bound up as they were with heathen practices, were destroyed to be replaced by *a doctrine of immortality based on a revelation given through the experience of fellowship with God on the part of his saints.*

[1] *Eschatology*, 2nd edition, p. 41.
[2] *Hebrew Religion, its Origin and Development*, p. 248.

We can trace this process in the book of Job. In the earlier parts of the book expression is constantly given to the hopeless views of death that were current in Israel (see especially chapters iii, vii, x and xiv). Yet out of the agony of his condition and by a faith that will not be silenced, Job gives vent to that noblest of all Old Testament declarations of immortality: "I know that my Redeemer liveth, and that He shall stand up at the last upon the earth; and after my skin hath been thus destroyed, yet without my flesh shall I see God . . ." (xix, 25*f.*). This probably testifies to a conviction that he will survive death and see God's justification of himself; it does not contain his settled conviction as to his eternal destiny, as the preceding part of the book shows; but clearly a man led to such a position as this could not stop there, but would be led to further conclusions in the same direction. The other outstanding Old Testament expression of the conviction of personal immortality comes from a man exercised in his heart somewhat similarly to Job; the author of Ps. lxxiii is troubled about the prosperity of the wicked as compared with the sufferings of the innocent. He is, however, led to see that whereas the wicked are cast away from the presence of the Lord, "Nevertheless I am continually with Thee: Thou hast holden me with thy right hand. Thou shalt guide me with thy counsel and afterward receive me to glory . . ." (vv. 23*f.*). Again, this faith is due to the realisation that the God who sustains his saints in all the vicissitudes of this present existence will not leave them at the end of the journey.

The faith so won in the battlefields of life's experience began to enter on a new development. For centuries the expectations of the people of Israel had been directed towards the advent of the "Day of the Lord" when God should introduce a new and blessed era of peace. But this had been a national hope; the ordinary individual did not imagine that if it tarried till after his death he would participate in it. When, however, the saints of God were given to see the light that shone from the other side of the grave, they began to realise that when that great day came, *they* would be there too, no matter how long it tarried. It is noteworthy that the earliest expression of this hope was wrung out of similar circumstances to those of Job and the author of Ps. lxxiii, viz., the writing of the Fourth Servant Song of Is. 53. The Servant who knew no iniquity was to be shunned by his associates as though he were leprous, ruthlessly beaten as though he were a criminal, led to the slaughter like a beast, and

at the end cast into a grave with the vile. Yet all this was the innocent bearing of the sins of his people. Death could not be the end for him. Hence the prophet declares, "When Thou shalt make his soul an offering for sin, he shall see his seed, he shall prolong his days, and the pleasure of the Lord shall prosper in his hand. He shall see of the travail of his soul and be satisfied. . . ." (vv. 10–12). If this poem relates to an individual, as we are convinced it does, these words can mean nothing less than resurrection after death. Not simply survival, but a life in some way renewed among the men of earth. This privilege is stated to belong to all the righteous in Is. xxvi, 19; in Dan. xii, 3, the only other mention of personal resurrection in the Old Testament, it is extended to the wicked with a view to judgment. From this time on, the more spiritual minds of Israel were perpetually engaged on the further elucidation of this matter; so arose the great apocalyptic movement, some of whose literature has survived to the present day in the pseudepigraphic apocalypses.

We cannot stay to dwell on the literature of the centuries immediately prior to the ministry of Christ save to mention one thing: in all the speculation which took place on the nature of the after life, it is clear that the formative principle which moulded the varying beliefs was the conception which was held as to the nature of the expected Kingdom. Where that kingdom was thought of in terms of earthly prosperity, the resurrection which preceded it was a purely earthly one; e.g., in the Fourth Book of the Sibylline Oracles it is said that "God himself shall fashion again the bones and ashes of men, and shall raise up mortals once more *as they were before*" (see lines 179-192). When, however, the Messianic kingdom is felt to be a temporary one, the resurrection is usually delayed to the end of that kingdom, after which the new heavens and earth are fashioned; since the resurrection body is for a new sphere, it is thought of in more spiritual terms. In 2 Enoch, therefore, which anticipates a millennium followed by the eternal kingdom, God says to Michael, "Go and take Enoch from out his earthly garments, and anoint him with my sweet ointment, and put him into *the garments of my glory* (xxii, 8)." Indeed, from the discussion as to the nature of the resurrection in 2 Baruch, one gathers that the conception of a glorified resurrection body is consequent on the idea of a new heaven and earth. Thus we read of Baruch's question, "In what shape will those live who live in Thy day? Or how will the

splendour of those who are after that time continue ? Will they then resume this form of the present, and put on these entrammeling members, which are now involved in evils, and in which evils are consummated, or *wilt Thou perchance change these things which have been in the world as also the world ?* " (xlix, 2–3). The answer given is that the earth is to restore the dead precisely as they were committed to it, in order to enable recognition and that the living may know that the dead have returned to life again ; the wicked will then gradually waste away and the righteous will advance from glory to glory (chs. l–ll).

The writers of Alexandrian Judaism looked for no future kingdom to appear ; in that case resurrection, if such we may call it, takes place immediately on death ; the righteous immediately gain the blessings of heaven, the wicked go to the pains of hell. Such a thought does not seem to be native to Palestinian Judaism and was rejected by the Jews of the homeland. They did, however, believe that the righteous and wicked entered at death on a foretaste of their respective eternal states while awaiting the Day of Judgment ; 2 Ezra vii, 75-98 sets this view forth in great detail.

When we turn to the pages of the New Testament, accordingly, we are already in the presence of a vivid and passionate hope, even before we read the words of Christ. The Sadducees, it is true, were reactionary, in that they clung to the older views which Job and the more spiritual minds of Israel grew out of ; but the mass of the people followed with the Pharisees and hoped for better things. When, however, we turn to the Christ himself, we find ourselves confronted with an astonishing situation. The long awaited kingdom, in which men are to be raised from the dead, He claims to be introducing here and now ; He wields authority from God to bestow the eternal life which belongs to that Kingdom ; the condition of gaining that life is attachment to himself. " The law and the prophets," said our Lord, " were until John " ; that is to say, the last prophet of the old order of expectation was John the Baptist. " From that time the gospel of the kingdom of God is being preached, and every man entereth violently into it " (Lk. xvi, 16) ; if men are entering the kingdom, despite its great cost, then the kingdom is present. Jesus accordingly told the Jewish leaders, " Verily I say unto you, that the publicans and the harlots go into the kingdom of God before you " (Mt. xxi, 31). He could tell the Pharisees, who were wanting to know at which future date the kingdom of God would

come, that " The kingdom of God is in your midst," for He, its king, was standing among them, with his disciples as some of its citizens.

Although this is clear from many utterances of our Lord in the Gospels, there is a persistent strain in the Fourth Gospel that has a forward look to an impending crisis, an hour that was soon to come upon the world. Jesus tells the woman of Samaria, " The hour cometh when neither in this mountain nor in Jerusalem shall ye worship the Father " (Jn. iv, 21) ; that hour undoubtedly refers to a time when the Kingdom will be manifested in fuller measure, so that the presence of God will be known to be universally available. Similarly, after the great invitation, " If any man thirst, let him come unto me . . .", the evangelist adds that this referred to the bestowal of the Spirit, which was not yet given " because Jesus was not yet glorified " (Jn. vii, 37-39) ; the scripture to which our Lord alluded was probably the prophecy of Ezekiel, which looked forward to the flowing of living waters from the temple in the kingdom age (Ez. xlvii, 1*f.*), while the Spirit himself was prophesied to be sent when the kingdom came (Joel ii, 28*f.*). Both these manifestations of the Kingdom were consequent on the " glorification " of Jesus. Yet again, when Greeks came to see Jesus, we find Him declaring, " Now is the judgment of this world : now shall the prince of this world be cast out. And I, if I be lifted up from the earth, will draw all men unto myself " (Jn. xii, 31-32). This we are told, and we hardly need the admonition, has the cross of Christ in view ; it would be the occasion of the conquest of the " prince of evil " and so of all his powers ; this overcoming of satanic powers is likewise yet another element in the expectation of the coming of the Kingdom of God (see Mt. xii, 28).

It now becomes plain that Jesus taught that through some stupendous act of his, the kingdom of God would be released in the world and with it the immortal life of God be bestowed on men in the here and now. This act was the twofold deed of death and resurrection ; its culmination was the phenomena of Pentecost, which Peter declared was the fulfilment of the prophecy of Joel and was the action of the risen Christ now exalted to the right hand of God (Acts ii, 16 and 33). The rest of the New Testament is full of this theme. The writers believe not merely that the kingdom of God is present but that they are living in it ; God " delivered us out of the power of darkness and translated

us into the kingdom of the Son of his love," declared Paul (Col. i, 13). Christians have been made alive together with Christ, share in his resurrection and in his exaltation to the heavenly life (Eph. ii, 5-6). Since they possess the Spirit of God, and with Him the life of God, they know that the rest of the blessings of the future life will not be denied them. For this reason, the Holy Spirit is called " the earnest of our inheritance," *i.e.*, the first instalment of the full quota, the sample of what is to be. The Holy Spirit mediates to the Christian the life of God now; He will bring that " germ " to full fruition by granting resurrection in the last day. " If the Spirit of Him that raised up Jesus from the dead dwelleth in you, He that raised up Christ Jesus from the dead shall quicken also your mortal bodies through his Spirit that dwelleth in you " (Rom. viii, 11). The time when this resurrection takes place is significant; it is at the Second Coming of Christ, when the kingdom of God that has been unfolding itself through successive stages will be brought to its full consummation. " As in Adam all die," said Paul, " so also in Christ shall all be made alive. But each in his own order ('rank' or 'class'): Christ the firstfruits; then they that are Christ's at his coming. Then the end, when He shall deliver up the kingdom to God . . . The last enemy that shall be abolished is death" (1 Cor. xv, 22-26). Just as the resurrection of Christ resulted in the bestowal of the life of God through the Holy Spirit, so the Second Coming will result in the consummation of that gift by the operation of the same Spirit with a view to resurrection. If it be asked, " How does this affect those who are not Christians? " the answer is that they too will be raised, but clearly in a form that cannot be the same as the Christian's, for the one is the result of the life of God coming to fruition, the other is the end of the process of a life lived alienated from God. Paul probably refers to these in the scripture quoted; the various " companies " to be raised are first Christ, then his own at his coming, then " the end company," when He delivers up the kingdom to God.

Two questions urgently arise from this outline. The first is one which naturally arises in the mind of an enquirer into Christian doctrine; " What proof has the Christian for believing that his system deserves any more credence than that of any other religion? " And secondly, " What is meant by the term 'resurrection'? " The former we can answer more confidently than the latter, which, however, is certainly a more desirable state of affairs than vice versâ!

It will have been noted that the crux of the Christian doctrine of immortality is not a philosophic principle, nor a peculiar angle on psychology, nor a supposed process of the future, but *an historic event of the past*, the resurrection of Jesus Christ. On that depends the Christian's present life no less than his future existence. That He was an extraordinary man none can doubt; but He went further and declared that He was the Son of Man, *the* Man, sent from God to save mankind from the death to which all are heirs; this He was to do by sharing in their death and bearing the brunt of the sin that keeps man from the life of God; yet in that same moment overcoming death by rising in the fulness of the life of God, a risen man, or rather, *the* Risen Man. Henceforth all who identify themselves with Him in his work for them may share that deliverance that He wrought for them.

That resurrection, we claim, is as historic as the death of which it was the logical issue. We possess documents that tell of the event, which, *in the sum total of their witness*, whatever critics may say about certain details, are unimpeachable. That event was the historic fount of the Church's life; without it, the world would never have heard of the Church; it would have died when Jesus breathed his last breath on the cross. Furthermore, it is the source of Christian experience which stretches in an unbroken chain from the first Easter Day across the centuries to to day. Every man or woman who can honestly testify to a new power that came into their lives when they committed themselves to Christ is a witness to his resurrection and therefore to the truth of the Christian doctrine of immortality. Eternal life is not something to which the Christian wistfully aspires as he gazes shudderingly at the grave; it is the inspiration of his present existence; in proportion as he knows the help of God in his daily life so he is sure of the future unfolding of that life in the ages that are to be. So many and so clear are the proofs of the resurrection of Christ, one does not hesitate to affirm that if they related to any other event of mundane history no one would dream of questioning the actuality of that event. The reality of Christian experience to those who yield themselves to Christ is such that they have a sufficient witness within that He who fulfilled his word that He would rise from the dead will also fulfil his promise that He will come again and so raise *them*. Christian immortality, therefore, has its feet firmly rooted in history and experience; nothing that hostile critics have ever adduced, or, we are persuaded, ever can, has power to shake it from its security.

As to the form of the resurrection body, the clearest evidence we possess is in the descriptions of the risen Christ. The simple statement of the first letter of John suffices for most Christians: "We shall be like Him" (iii, 2). If we wish to enquire further as to what He was like in his appearances we have to study the records. From them we gather that the body of the risen Jesus was not simply a resuscitated corpse; He was able to appear and disappear at will, He was never *immediately* recognised, He assumed different forms (Mk. xvi, 12), He wore clothes which apparently went out of view when He did. From considerations such as these Westcott inferred that "the special outward forms in which the Lord was pleased to make Himself sensibly recognisable by his disciples were no more necessarily connected with his glorified Person than the robes which He wore."[1] We generally content ourselves with saying that Jesus "transformed" his body so that it became a "spiritual" body. If we are honest, we have to admit that we do not know what we mean by the word "transformed" in this connection, except that it was a process by which the body of Jesus became something wholly other than what it was before. It may be that the particles of the Lord's body were dissolved to give place to a form of matter for which we have no better term than to call it "spiritual" (i.e. not "made of spirit," but "subordinate to spirit"; the body of Jesus manifested itself through the spirit, rather than his spirit manifesting itself through the body as in our case). This was what Paul anticipated our resurrection body would be like; "It is sown a natural body, it is raised a spiritual body" (1 Cor .xv, 44).

The great difficulty, however, on which we have not touched, is the connection between the "natural" and "spiritual" bodies. In our Lord's case, his body did not see corruption whereas humanity in general does experience it. If, however, we are right in supposing that even in our Lord's resurrection the dissolution of his material body was involved in order to give place to the spiritual body, then the difference is more apparent than real. It is unlikely that Paul imagined the material particles of a corrupt body would be regathered in resurrection, for he distinctly disclaimed that flesh and blood, otherwise termed "corruption," can inherit the incorruptible kingdom of God (1 Cor. xv, 50). Even the living have to be "changed"

[1] *Gospel of the Resurrection*, p. 112, note.

at the coming of the Lord. If Paul thought the material body was first raised and then changed, he would be advocating the view already referred to as set forth in 2 Baruch, but the whole drift of his teaching is against it. It is generally agreed that the essential nature of a body lies not in its material elements but in the principle of life which maintains its characteristics through all forms of development; it is not impossible that what we mean by the resurrection of the "body" is the reclothing of that principle of life by elements suited to the new environment of the heavenly life, so forming a "spiritual body." Again, what relationship that "principle of life" holds to the surviving personality or soul of man that subsists in both forms of existence, no man has yet been able to say. Perhaps we never will be able to comprehend it this side of the resurrection.

Undoubtedly we are treading in realms beyond the experience of our present life, and realms, therefore, in which speculation can only be tentative. What, however, we must insist on is that where reason is baffled through lack of knowledge, it is to be remembered that the process has taken place *in history*, and that not simply in the case of *a* man but of *the* Man, who stands in the unique relationship to all mankind as creative Lord. That resurrection is a datum of human nature as such, and shows that our resurrection, whatever it involves, is as certain as his, even though our own particular conception of the process may be inadequate.

It remains to be noticed that the resurrection of man is to be part of the renewing of the entire cosmos. Not only man but his whole environment is to be made worthy of the kingdom of the new creation. "Nature will not be discarded in order that men's souls alone may be salvaged and saved" wrote A. M. Ramsey; "rather will all that God has made have its place and its counterpart in the new heaven and new earth."[1] The Christian doctrine of immortality thus not only ensures a true community of immortals but their complete unity with the creation of God. He who has already broken into history in order to achieve this, and even now holds the reins of government for the outworking of his purpose will surely consummate his plans in his own good time. Then, at last, will the cry go forth, "Behold I make *all things* new!" (Rev. xxi, 5).

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[1] *The Resurrection of Christ*, p. 115.

869TH ORDINARY GENERAL MEETING

HELD AT 12, QUEEN ANNE'S GATE, WESTMINSTER, ON THE 10TH MARCH, 1947.

The Revd. JOHN W. CARROLL in the Chair.

THEOLOGY AND SOME RECENT SOCIOLOGY.

By the REV. D. R. DAVIES.

PART I. A CHANGING CLIMATE.

IT is an indisputable fact that the intellectual activity of civilised man is subject to climatic changes, in which one system or general scheme of related ideas rather than another tends to be instinctively accepted. Let me put it in another way. In certain eras, we find that there is a general predisposition in favour of a particular group of co-related ideas and values, when the trend of the time makes them predominant There is a tide in the intellectual affairs of men which carries one set of ideas rather than another into a position of predominance. As long as that particular tide is flowing, opposition to the ideas carried onward by its currents is powerless. Logical demonstration against the predominant ideas has no weight, and the consequent tears of the logicians are full of bitterness. The climatically favoured ideas have it all their own way. They are batting on an easy, cast-iron wicket, which robs the bowling of all its terrors. The reasonableness and indeed the inevitability of these ideas seem to be taken for granted. For the time being they are immune to the sharpest attacks. The best minds of the time, which, of course, are always to be found among the young, are all captured by them.

This, in fact, is how civilised society does most of its thinking, which has hardly begun to be realised and appreciated. What may be termed the sociological factor in the *process* of thinking (as distinct from its results) is as yet in the pioneer stage of investigation, as anyone can see who takes the trouble to examine

Mannheim's Ideology and Utopia. Whatever the explanation may prove to be, if it ever proves to be anything, the fact itself is beyond dispute. It is most flattering, but almost completely false, to assume that conscious rationality is the only, or even the important, factor in men's thinking. This assumption is partly the unconscious product of the modern dogma of the infallibility of reason. It is indeed most touching to imagine that men start off in a kind of no-man's land or ivory tower and proceed to a purely rational estimation of evidence, for and against, ideas and opinions. It invests the individual, as a thinker, with a touch of Roman nobility and dignity. This is the idea of the thinker which Rodin has symbolised in his celebrated sculpture, "The Thinker." There Rodin has chiselled the figure of a naked man, seated, chin resting heavily on his hand, with his elbow on his knee—lost in profundity. As a piece of sculpture, it is magnificent. But as a representation of the average process of thinking, it is bunkum. Are we to believe, for instance, that Professor Laski's cocksure dismissal of Christian dogmas is the result of cold, pure ratiocination, of a dispassionate, abstract estimation of evidence? Not even the marines would be gulled by such a fiction.

We find ourselves, not in an ivory tower, but in a dynamic social process, in which varying systems of ideas and values predominate at certain periods. It is with these that our thinking starts—with what has been called "the mental furniture of the time." They operate in overlapping and interlapping spheres —in concentric circles, so to speak. We find certain systems of ideas dominating the scene in theology, sociology, philosophy, etc. Whilst these areas (or rather functions) are distinct, they are not separate and isolated from one another. The dominant ideas in theology, for example, are not isolated from the dominant ideas in philosophy, and sociology, and vice versa. The task for which I have been conscripted in these lectures is to indicate some of the relations and similarities between these predominant systems of ideas, so as to suggest, if not even to demonstrate, that both Church and world move in the same universe of reference; that both Kingdom of God and civilisation (which are by no means the same thing) are concerned with common objects on different levels—please note, *on different levels*; that both theology and secular culture are seeking to solve the same problem in different formulations. It is the failure to realise these relations and similarities which so largely accounts, in my

judgment, for undue inferiority-feeling in theologians, and for undue complacency and fatuousness among the purely secular thinkers, particularly the sociologists.

I.

We can now note another indisputable fact, namely that during the last twenty-five years the theological climate has been undergoing a very great change indeed. From the sunny, cloudless skies, the warm, gentle breezes, the clear light of nineteenth-century optimism, the climate has changed with a vengeance. Our sky is overcast with heavy, thunder-laden clouds. Breeze has changed into a veritable east wind, and visibility has sadly declined. Those wonderful distant vistas which so delighted and excited our theological fathers have terribly shrunken. Visibility, as they say in the weather forecasts for shipping, is poor. The prospect has narrowed. We are navigating in half-light, and the promise is not good. The prophet of smooth things is having a hard time of it. My heart goes out to him, though not my head. The thing cannot be questioned. We are enjoying—or rather enduring—a climate vastly different from that enjoyed—literally enjoyed—by preceding generations. Certain theologians, whose sight was determined by insight (e.g., Peter Forsyth), sense a coming depression in the climate. Events have fully justified their intuition. The depression has broken upon us. The vials have emptied themselves upon our generation. What are the concrete facts behind all these metaphors? If we study the development of theology in post-Reformation Europe, we cannot fail to notice a most unfortunate process, which can best be described as the growing irrelevance of Christian orthodoxy. It was a process in which, on the one hand, civilisation was developing on assumptions and values very different from those of Christian orthodoxy. On the other hand, theological dogma was hardening into a barren isolation, with the result that theology was tending to get more and more out of touch with actual, living social development. For this process, the Church had to pay a costly price, as she always does, whenever theology, orthodox theology, becomes irrelevant to the actual living processes of civilisation. The penalty of allowing orthodoxy to degenerate into irrelevance is to stimulate the predominance of theological heresy, which comes about in the endeavour to make theology relevant once again. This is what happened, at least in the Protestant countries of Europe.

Theology was forced into a false relevance to social development, and so became heretical. Orthodox dogma underwent an adaptation to an essentially secular, un-Christian, not to say anti-Christian, historic evolution. This process can be summed up, not unjustly, by saying that orthodox Christianity was naturalised. Or better still, the Gospel suffered desupernaturalisation. Orthodox dogma, which for ever challenges and denies the natural man, was devitalised, so as to force it into an uneasy, deadly marriage with secular civilisation. Civilisation is the natural man in a state of unwilling allegiance to supernatural sanction, which is made manifest and audible in conscience. By adapting orthodox dogma to the natural man, by cutting its claws and drawing its fangs, which deprived the Gospel of its offence to self-centred European humanity, theology did acquire a new, but false and deadly and temporary relevance. It interrupted the education of Europe's conscience in Christian sanctions and demands. In the long run, that is what heresy always does. The insistence on the overwhelming importance of orthodoxy is nothing less than the evangelical instinct of survival, which is but another way of saying Holy Ghost. In the later decades of the nineteenth century this adaptation of orthodox dogma to secular civilisation has achieved a deadly triumph—a triumph which spelled disaster both for Church and civilisation. The disaster is visible to all of us, but the roots of the disaster are still unrealised by many—far too many. The moral of all this is —*never allow orthodoxy to drift into social irrelevance.* Guard against it as you would against poison. Let us note, very briefly, some of the theological forms assumed by the brave new artificial relevance.

The central and decisive form of this process of theological adaptation was the prominence assumed by the doctrine of a secularised Kingdom of God. This dictated all the rest of the changes in theological emphasis. It constituted the predominating character of the new climate. The secularising of the Kingdom of God necessitated the transposition of nearly all the great dogmas also into a secular key.

The crucial element in this process was the identification of the Kingdom with historic progress. History, it was assumed, was itself the Kingdom of God in the making. It followed that the Kingdom was something that man had the power to create. Step by step, all the rest followed. The New Testament affirmations about man, re-created in Christ, came to be made about

the natural man. Hence sin, especially original sin, was whittled down to savage survivals—a thesis which was argued at great length, and with considerable acumen and persuasiveness, by Dr. Tennant. Hence, also, the Kingdom inevitably degenerated into mere civilisation. In due course, Christ's Atoning death faded into martyrdom. The dogma of the deity of Christ was transformed into the dogma of the potential deity of humanity. Fundamentally, Christ was like one of us, though which one of us was never indicated. Deep down, every man was a potential Christ. Let civilisation continue with the task of the sublimation of the instincts still operating from a savage ancestry. In good time, biology will become theology, and all will be well. Time, gentlemen! That was the supreme desideration. And that was guaranteed by a God more immanent than transcendent.

This whole process can be surveyed in the inflated maturity of the classic Liberals of the early 1900's—Harnack in Germany, Sabatier in France, Adams Brown, Peabody, Shailer Matthews in America, Rashdall and the Anglican Modernists in England. Their work constituted the dominant theology. The wicket on which the Liberals were batting was such a paradise of a wicket that the bowling of Forsyth even could make little impression. Only three of Forsyth's forty books achieved a second edition in his life-time. Up to 1914, or thereabouts, theological Liberalism was bursting with superiority feeling.

Alas! The scene has changed. Nobody, at least, contends nowadays that theological Liberalism is part of the mental furniture of the time. In military parlance, the initiative has fallen from its hands. Theological Liberals may not believe in the Fall of Man, but they have no option about believing in the Fall of Liberalism. Whether or not Liberalism is true, there can be no doubt that it is supine. Every man a potential Christ doesn't sound quite so convincing to a generation that has smelt the fetid breath of a Himmler. Not even Canon Raven, one of the last of the barons, can disinfect that breath. We are living in a different climate. Orthodoxy is once again thumbs-up, with its head well back and chin well forward. Let us glance merely at the high spots of the change.

The leading personal figures in the recent process of theological change, its creative force in other words, all tend to suggest the

importance of what I have called the sociological factor in thinking—in theological thinking as in secular thinking. They all found themselves, spontaneously so to speak, in revolt against the established Liberalism. There is nothing in their work or their experience to suggest that they started from the remote, abstract point of dispassionate consideration of existing theological ideas. The Liberalism that they inherited they suddenly began to suspect, not in terms of this or that idea, but as an attitude, as an organic entity, as a co-related system. Their suspicion ripened swiftly into revolt and rejection. Neither the suspicion nor the rejection was the result of a prolonged, conscious process of ratiocination. It was suddenly *there*—unavoidable, inescapable, ineluctable. There was, of course, a process of logic in the rational analysis and testing of the suspicion or the intuition of the unsoundness of their inheritance. But the intuition was not the fruit of individual reflection. That was the involuntary, sociological factor. So creative genius has also its element of determination. Creative genius in theology, as in secular culture, is partly a product of the age, of the social process. Let us note a few.

Barth, whose essential contribution to theology was made in 1918, was partly a product of defeat and disillusion. He transformed the whole theological scene. He dictated the issues and problems of theological thought for a whole generation. His word became a bridge from one theological epoch to another. I am not concerned here whether Barthianism is true or not. The immediate point is that he, more than any other single theologian, dethroned Liberalism. He profoundly influenced the process towards a new set of dominating theological ideas and values. Barth's work made many of the issues uppermost in Liberalism appear secondary and even trivial. He reopened what the dominant theology had long since regarded as questions finally closed and settled. The stone which an age-long triumphant Liberalism had complacently rejected, Barth made the head of the corner.

Berdyaev is another significant, creative figure. He too is partly a product. Whereas Barth was partly the product of a national defeat, Berdyaev was partly the product of a victorious revolution. He found himself in a process of conquering Marxism. He realised, as in a flash, that the Kingdom of God cannot be institutionalised, and so he broke with Bolshevism. Berdyaev

made Christian orthodoxy relevant by revealing the contradictions inherent in civilisation. He has renovated the whole problem of eschatology.

Niebuhr is the third member of the theological Directorate that has been guiding the whirlwind to the new climate. He started as an aggressive Liberal, but before his student days were over he had raised the flag of rebellion. Thirteen years in Henry Ford's, Detroit, confirmed for him the wisdom of his youthful intuition that his Liberal inheritance was exhausted. Niebuhr was driven to theological orthodoxy by a revolutionary sociology. In order to continue his movement to the left in politics, he discovered that he had to move to the right in theology. It has been one of the most revolutionary and fruitful discoveries in the whole history of theology.

And now abide Barth, Berdyaev and Niebuhr—these three. And the greatest of these is Kierkegaard, the Danish philosopher and theologian, from whom they derive unconsciously. There is, of course, a host of slightly lesser lights—fainter stars and brighter moons, of whom time forbids any mention even. Taken together, they symbolise the new theological climate, in which orthodoxy has become the government and Liberalism a disintegrating opposition.

The outstanding doctrinal, dogmatic features of the new era are few in number, but profoundly and comprehensively significant. The primary one, undoubtedly, is the rehabilitation, nay, the renascence of the supremely optimstic dogma of Original Sin, with its juster appraisal of the doctrine of divine creation and diviner re-creation. This is where the work of Niebuhr, in particular, is so overwhelmingly important. In his Gifford Lectures, he has revealed the expansion of this single dogma into a solar system of theology, and also into a system of sociology, which is threatening to undermine the foundations of the secular sociologies, as I shall try to indicate at a later stage. In Niebuhr's hands, the dogma of Original Sin becomes an instrument for the permanent deflation of the claim of secular civilisation to aspire to become the Kingdom of God, or the Republic of Man, or the Parliament of Humanity. It is a bomb of atomic capacity for exploding the pretensions of the self-centred, natural man. The dogmatic feature next in importance is eschatological, with its renewal of the Kingdom of God as supernatural, transcendent, and God-given. The big noise here is Berdyaev, who has

directed this dogma into a Christian philosophy of history. In short, the orthodoxy which has again become predominant is revealed as a necessity for the presentation of the possibility of secular civilisation *in this world*. We have always known the significance of orthodoxy for the next world and the Kingdom of God. We are now discovering its indispensability for this world and for the privilege of civilisation to continue being un-Christian. That orthodoxy is a necessity for the salvation of the soul in the next world is an old story. But that it has also become necessary to feed the body in this world is news. Our terribly secularised generation will not say: "Tell me the old, old story." But it had better listen to the new, very new, story. Its physical survival depends upon it.

PART II.—SECULARISM WITHOUT AN UMBRELLA.

The late Mr. Neville Chamberlain always carried an umbrella, even when he had no need of one. On one celebrated occasion, he flew to Germany with his umbrella, when he would have done better, on that occasion at least, to have exchanged his umbrella for a gun. Whilst a gun would have been useless in a shower, it would have impressed Hitler a lot more, even had it rained. It might conceivably have postponed the storm which broke on Europe a year later. However, in the changed climate which secular culture, like theology, is experiencing secularism (or Humanism) has been caught without an umbrella, and it is, in consequence, getting soaked not to the skin, but to the soul.

Now, the point at which theology *visibly* touches secular civilisation is in a theory of human nature—i.e., in sociology and psychology. In these realms of thinking, theology operates directly. The relation, therefore, between theology and sociology is most intimate and immediate. Ultimately, of course, theory of human nature goes back to one's doctrine of God, which, however, does not reflect itself immediately in the character of a civilisation. That is an indirect, long-distance process. That is the reason for the contemporary illusion that belief or disbelief in God, in the Christian revelation of God, makes no difference to the historic, social process. Belief in God makes its impact on society, as distinct from personal relations, through a whole range of related doctrines, of which a doctrine of human nature is the end doctrine. At that point it joins hands with secular sociology.

Consequence is direct. There is no further intervening metaphysic. That also is the reason why a renascence of religious belief will take time to make itself felt in actual social institutions. We need a renewal of faith now—i.e., the process of renewal must begin now—if mankind is to surmount the next crisis in civilisation. We have secured a breathing space in the present crisis—we haven't solved it by any means—through a dwindling heritage of faith. But that shrinking heritage will not secure the continuity of the Christian, European tradition in the next crisis of civilisation. And there's going to be a next crisis. Don't make any mistake about that. The present upheaval of civilisation is simply formulating the ultimate issues of man's historic existence. It isn't settling them. It is merely defining them. Their solution will most surely involve civilisation in future crises, for the overcoming of which we need the beginning of Christian renewal *now*. Such a renewal will, I believe, be facilitated by a just appreciation of what is happening at present in secular sociology, psychology and philosophy.

I.

The essential significance of contemporary secular sociology can be expressed in a sentence: it is an effort to modify and adapt, without, however, fundamentally changing, a theory of human nature which, under the pressure of recent developments in civilisation, has clearly broken down. This effort takes many different forms, some of which are mutually inconsistent, but all of which are involved in a contradiction of one kind or another. These varying contradictions are inevitable in a sociology which rules out what the Christian faith has to say about the human nature which is the raw material of sociology as a science, or an alleged science, which, of course, sociology is not and never can be. It would, obviously, require at least a volume to elaborate this statement. In a lecture I can do no more than offer a few illustrations. There is no need to spend much time in showing that the classic Liberal doctrine of human nature has broken down. Every single one of its assumptions has been falsified by the grim and undeniable argument of events. Nothing makes this clearer than the contrast between the expectations of the Liberal sociology and their actual historical falsification. Here, for instance, is Sir Herbert Spencer: "The ultimate development of the ideal man is certain—as certain as any conclusion in which we place the most implicit faith, e.g., that

all men will die. . . Always towards perfection is the mighty movement—towards a complete development and a more unmixed good. . . Progress is not an accident but a necessity. What we call evil and immorality must disappear. It is certain that man must become perfect." That was written nearly one hundred years ago. What an ironic commentary on these hopes is provided by contemporary totalitarianism, which is a complete exposure of the classic Spencerian sociology.

Reinhold Niebuhr, in his book, *The Children of Light and the Children of Darkness*, shows how complete is this breakdown in his analysis of democracy and the fate which has befallen it in our time. " There is a more fundamental error," he writes, " in the social philosophy of democratic civilisation than the individualism of bourgeois democracy and the collectivism of Marxism. It is the confidence of both bourgeois and proletarian idealists in the possibility of achieving an easy resolution of the tension and conflict between self-interest and the general interest . . the social idealism which informs our democratic civilisation had a touching faith in the possibility of achieving a simple harmony between self-interest and the general welfare on every level. . . . The confidence of modern secular idealism in the possibility of an easy resolution of the tension between individual and community, or between classes, races and nations, is derived from a too optimistic view of human nature." It is this " too optimistic view of human nature " which contemporary secular culture is seeking to salvage and refit for duty in a technical, totalitarian era. In its classic, unblushing, undiluted form it is no longer acceptable. It has ceased to be part of " the mental furniture of the time." But it is not abandoned, which would be the logical thing to do. The process of secularisation has gone too deep in the modern mind to tolerate simple logic, when logic tends in the direction of Christian dogma. As a man claiming to be scientific wrote recently, " if we cannot find the real cause of social injustice, we would be forced to go back to the absurd doctrine of original sin." And that would never do, be it ever so scientific! *How can the Liberal theory of a self-sufficient human nature be made workable in the new situation?* That's the dominating problem in current sociology, psychology and philosophy.

II.

The chief answer to this question is being provided by the providential discovery of the irrational element in psychology

and of its vast importance in social and political life. The modern pioneer in this discovery was Freud, who stumbled on his concept of the Id, or Unconscious. When Freud and his kindred and successors came to investigate the content of the Unconscious, they made the shattering, revolutionary discovery that its operations were completely different from those of the conscious mind, of reason. There was a complete absence in the Id of those processes which we call rational—classification, selection, deliberation, co-ordination, etc. It was characterised more by instinct than by reasoning. It was dynamic, assertive, undifferentiated, which are all qualities of will rather than of reason. In fact, the Unconscious of Freudian and co-Freudian psychology is will uninfluenced by reason, by rational ratiocinative process. This would seem to be merely a re-statement of Schopenhauer's concept of the world as blind will. But it is not. Where Schopenhauer's will is blind and self-contained, Freud's Unconscious is neither blind nor isolated. It is pervasive and dominant in the psychic structure of man. Whereas in Schopenhauer reason was an independent activity, in Freudian psychology conscious reason tends to be the instrument of the Unconscious, which accounts for the predominance of the irrational element in human thinking and behaviour. Mind, at least a great deal of the rational process, is a function of the Unconscious, operating to make the fundamental impulses of the Unconscious acceptable to the conscious mind. Much of conscious thinking, i.e., is a process of " rationalisation " which, in effect, is the endeavour to give to the irrational the semblance of rationality. Thus the element of the irrational comes to exercise a preponderating influence in civilisation. This discovery has been a godsend to secular sociology, since it obviates the disastrous possibility of having to fall back upon theology and dogma ; orthodox dogma, to boot.

Here then is a general recognition by secular psychologists and sociologists, who cannot be accused of theological prejudice, that social and individual behaviour is influenced more by irrationality than by conscious reason. This is a very interesting admission from the point of view of the theologian. It does not constitute a proof of original sin. Neither that nor any other Christian dogma can be proved in the scientific sense. Revelation does not lend itself to logic. Whilst, therefore, the concept of The Irrational is not a proof of original sin, it is, at least, not inconsistent with original sin. Indeed, it is very much what one would expect, if the dogma of original sin is a reality and not a

fantasy. The dominance and persistence of The Irrational in civilisation is much more consistent with original sin than with the assumptions of the Liberal sociology. That is a most important interim point to note. What is the answer of contemporary sociology and philosophy to the psychological fact of The Irrational ? What conclusions do they draw from it ? Theology sees in it a rehabilitation of the dogma of original sin. What do sociology and philosophy see in it ? Their conclusions can, I believe, be broadly classified into three groups.

First, is the conclusion, which, in fact, is a conclusion of cynical despair, that human nature is incurable, irredeemable ; that there is nothing to be done about it except to endure it ; that, therefore, in the final analysis, power is the essential reality in human relations, and the only thing that counts in the ultimate issue, since power is alone capable of restraining the irrational. This theory is Hobbes brought up to date, refurbished for the era of technology and the mass-mind. It accepts the inevitability of totalitarianism and endows the minority with the permanent right to dominate the majority. All moral values, principles and ideals are dismissed as mere rationalisations of power ; mere devices to make the exercise of power by the few palatable to the many. Morality is the velvet glove worn by the iron hand of power.

Now, the interesting feature about this sociology is that it is the work mostly of disillusioned Marxists, of whom James Burnham and Max Nomad are leading and typical examples. I must be careful to avoid misunderstanding here. I do not say that all disillusioned Marxists fall into this brutal nihilism. They do not. Some do. The point I am making is that most of those who formulate this social philosophy happen to be disillusioned Marxists. Their very honesty and sincerity in recognising the utter contradiction and falsification of the ideals or principles of Marxism in practice do not save them from assent to the oppression which originally inspires their disillusion. On purely humanist assumptions, moral values inevitably dissolve. In the case of the disillusioned Marxist of the Burnham type, the dissolution is direct and immediate. In other cases, it is devious and prolonged, but none the less certain. Few happenings in the war were so morally significant as the ease with which so many disillusioned Marxists went Fascist or Nazi—Quisling, Deat and Doriot are outstanding examples.

This philosophy of what may be termed decadent Marxism is morally better and more significant than any of the orthodox philosophies of mere power, like Nazism, Marxism, Prussianism. In Nazism, for instance, power was still idealist. It was an instrument of racial domination, and therefore had greater power to deceive and lead astray. The fundamental immorality of power is obscured whenever power is presented as the instrument of some ideal, whether it be race, class or nation. The final divorce of power from idealism of any sort does, at least, leave no further foothold for illusion. And that clarifies the ultimate issues of life and death. For this reason, decadent Marxism, since it clears the ground, is of great moral and spiritual significance in the development of civilisation. It does reveal Christian faith as the only real alternative to despair; for the decadent Marxist will not be deceived by the mythical, illusory alternatives, which he has already exhausted.

It is not necessary to say much about orthodox Marxist sociology, which has always done more justice to the irrational element in the historic process than the Liberal sociologies. But the insight of Marxism vanishes when it comes to analyse this irrationality. It attributes it to external economic relations. When capitalist ownership is abolished, then society will become rational. Perhaps the best comment on this were the Moscow Trials of 1936–1938. They were supreme examples of rationality! As Mr. Churchill once said, they were the conclusive manifestation of the gulf that yawned between the Communist mentality and the Western.

In the second group are the sociologists and philosophers, political philosophers, whose faith in reason is paradoxically fortified by the fact of irrationality. They are the re-edition of the eighteenth-century rationalists. They formulate a new rationalism, which is but a fresh version of the German Enlightenment of the eighteenth century. Professor Laski and Professor Haldane are examples. They cling the more desperately to reason because the only alternative they can see is unreason. Having ruled out revelation, they have nothing left but reason, without which their whole world collapses. They are in the position of gamblers who have only one card to play. That card must win the trick, since failure to do so simply cannot be contemplated. They remind me of the Englishman who, when talking to a foreigner who doesn't understand what he is saying, simply repeats himself *in a louder voice.* The fellow must be

able to understand. His trouble must be a little deafness. So say it louder. It is as easy as that! They continue to cling to the fatal assumption that *reason*—the faculty of *knowing*—is capable of correcting or solving the contradiction of the will, the faculty of *doing*, behaviour. They persist in affirming, in spite of all the evidence, that perversity in conduct is due to ignorance in the mind. That is what I mean by faith in reason. Denial of trust or faith in human reason must not be confused with unreason; with unbelief in reason as an instrument for dealing with experience, as a factor in personality. Lack of faith in reason is not equivalent to unreasonableness. In fact, the opposite is true. The unreasonable man is he who attributes to reason powers which it does not possess. One of these powers is ability to transcend basic human egoism. That is precisely the error of the new rationalists.

In the third group are the social philosophers of the half-way house, of whom the outstanding example is Mr. Lewis Mumford, one of the leading American sociologists. These are not they who are arrayed in white robes, for the simple reason that they have not yet come *through* "the great tribulation." They are still in the midst of it. These, rather, are they who want to eat their cake and have it, who endeavour to combine Christian realism with secular illusion. Among this group are some of the finest and acutest minds in contemporary culture. I've mentioned one of them—Mr. Mumford. Aldous Huxley is another. Mr. Arthur Koestler is a third. Ortega Gasset, the Spanish philosopher, is a fourth. They represent what is still sound, what has so far escaped corruption in European culture. They are, therefore, of immense significance for the Church in relation to our profoundly secularised generation. They are the pioneer rebels against a culture which has been completely secularised, a culture which has become wholly confined to the one dimension of this world.

The relevant feature of their social philosophy is their urgent plea for the recovery of the Christian values of civilisation whilst refusing to face the fact of their theological foundation, *without which they cannot be maintained as social forces.* Christian values and principles of social development are the fruit of Christian theology. The—what shall I call them?—"semitarians" want the social values of Christianity but they shy away from the theology.

Part III.—Theology and Social Values.

I.

In order to illustrate the "semitarian" social philosophy, I will present and analyse a single example. This method will, as I see it, best enable us to appreciate its merits and estimate its defects. I choose for my example Mr. Arthur Koestler, a man of acute and passionately sincere mind. Mr. Koestler is a Jew, which I mention, not to decry him, but rather to enhance his significance. Let me say a word or two about him personally.

Mr. Koestler is a Hungarian, an ex-Marxist who has played a very active part in the revolutionary struggle in pre-war European politics. This is a fact of importance in Mr. Koestler's significance, because his revolutionary activity brought him terrible suffering, from some of which he lifted the veil in his books, *Spanish Testament* and *Scum of the Earth*. He spent three weeks in one of Franco's prisons in daily anticipation of being shot. A man cannot exist for twenty-one days suspended between life and death without something happening. And a great deal happened inside Mr. Koestler. For instance, he acquired a merciless eye for ultimate spiritual realities, an eye which penetrated every disguise of humbug and rationalisation. Suffering transformed his sight into insight. In due course, insight nearly always produces hindsight and foresight as well.

It is interesing to note that profound and extreme suffering has played a vastly important rôle in the most influential and creative minds of our time. Berdyaev is a case in point. Chesterton once said about Dickens, who as a boy had worked in a blacking factory, that he learnt how to whitewash the universe in a blacking factory. So Berdyaev learnt the inner meaning of freedom in prison. Mr. Koestler is among the *élite* who have come to reality through suffering. This fact alone would be sufficient to establish his significance for contemporary culture. But this is by no means his only significance. He is an ex-Marxist, whose disillusionment with Marxism has resulted in a creative spiritual experience, of which we get more than a hint in his book, *The Yogi and the Commissar*.

Mr. Koestler's disillusionment has been prompted by the way in which Soviet Russia has developed. The Socialism to which he had looked for a deep and abiding liberation of the human personality has resulted in a new slavery for the individual, far exceeding in ruthlessness and thoroughness all

preceding tyrannies. Communist totalitarianism, says Mr. Koestler, has not only destroyed personal liberty, it bids fair to destroy human personality itself. This historic result of Marxism in Russia has made Mr. Koestler a rebel against Marxism, which is the final logic of secular self-sufficiency. His discovery is, not that Marxism has been wrongly applied, but that totalitarian suppression is its necessary logic. The greatest of all the secular hopes of the modern world, says Mr. Koestler, has proved to be a mockery and a contradiction. "The tragedy is that only those realise what oxygen means who have known the torture of suffocation; only those who have shared the life of the ordinary native in Nazi Germany or Stalinite Russia for at least a year know that disintegration of the human substance which befalls people deprived of our basic liberties. . . . The English journalist does not know the difference between a limited freedom of expression and the status of a human teleprinter. The English highbrow, fed up with a statesman's cigar or a general's photo-mania, has no idea of the abject idiocy of regimented, byzantine leader-worship. The English public, disgruntled but secure within the law, does not know the shivering insecurity, the naked horror of an autocratic police state. They only know their own frustrations. The atmosphere of democracy has become a stale fug, and those who breathe it cannot be expected to be grateful for the air which it contains. The predicament of Western civilisation is that it has ceased to be aware of the values which it is in peril of losing." (*Yogi and Commissar*, p. 218.) Mr. Koestler's great problem is: "How can these values be revived?" (*Ibid.* p. 218.)

The answer given by Mr. Koestler to this question reveals very clearly his half-and-half attitude. It reveals his pathetic, desperate clinging to the remnants of secular illusion. It shows up the moral cowardice of an intellectually brave man, the fatal reluctance to exercise the logic of his own realism. His answer is an anti-climax, a bathos, like an elevated oration concluding in a vulgar doggerel, or a Beethoven cadenza trailing into a jazz croon. "In other words," says Mr. Koestler, "the traditional values can only be revived by the forces of progress"!! He expects the renewal of the traditional European values, which are supremely Christian, from those very forces which have been progressively and ceaselessly undermining them for the last five centuries. He expects the renewal of traditional values, which are rooted in a two-dimensional order beyond time, to

come from those forces which are obsessed with this world only. He looks for the renewal of the values of personal liberty, of worship, of the absoluteness of conscience, of the sanctity of truth and the pledged covenant (which are the traditional values), from social forces which have insisted on the relativity of all truth and conscience, on the absoluteness of collective humanity, on the subordination of liberty to material security. He expects the restoration of the Europe of Augustine, Aquinas, Shakespeare, Goethe, Abraham Lincoln, Gladstone to come from the Laskis, Haldanes, Kingsley Martins! Could anything so eloquently proclaim the paralysis and bankruptcy of the sociology of the halfway house? Mr. Koestler himself is reluctantly and uncomfortably aware of this, for he goes on to say that "without a spiritual renaissance the socialist movement will continue on the road of bureaucratic ossification to the end." (*Ibid*, p. 219.) "The age of enlightenment has destroyed faith in personal survival; the scars of this operation have never healed. There is a vacancy in every living soul, a deep thirst in all of us. If the Socialist idea cannot fill this vacancy and quench our thirst, then it has failed in our time. In this case the whole development of the Socialist idea since the French Revolution has been merely the end of a chapter in history, and not the beginning of a new one." (*Ibid*, p. 226.) The desperation of Mr. Koestler's case is abundantly demonstrated by his utterly fantastic hope that the Socialist idea can fill the vacancy in the soul of modern man caused by loss of faith in immortality.

What does Mr. Koestler mean by the spiritual renaissance of the Socialist idea? He means by it "the creation of a new fraternity in a new spiritual climate, whose leaders are tied by a vow of poverty to share the life of the masses, and debarred by the laws of the fraternity from attaining unchecked power. If this seems utopian, then Socialism is utopia." (*Ibid*, p.225-6.) Mr. Koestler is quite evidently in some doubt about the possibility of this. I share his doubt, in spite of the fact that the Left Wing intelligentzia have gone so far in participating in the life of the masses as to wear corduroy trousers, which, by the way, have ceased to be a proletarian fashion. History, at any rate, does not encourage the idea that spiritual revivals originate from trousers, even though they be made of corduroy. If clothes have anything to do with spiritual renaissance, which cannot be dogmatically affirmed, then there is better historical ground for associating spiritual renaissance with the cassock than with trousers. But that is another story.

This, in varying degree, is the situation in which the "semitarians" find themselves trapped, like butterflies in a bottle, inside which they are beating their beautiful iridescent wings in vain. I'm not being ironical. Mr. Koestler's wings *are* beautiful. There is purity in his passion for the tormented spirit of our time. There is more than a breath of nobility in his aspiration for the liberation and redemption of our civilisation. But he must escape from the last remaining illusion that frustrates him. And that goes for all the sociologists and philosophers who are huddling together for some warmth and protection in the shelter which the lightning has struck. Mr. Mumford, too, is desperately aware of the need for spiritual renewal. "Our society is now," he writes, "at a stage when conversion—an inner change and redirection—must precede every interchange or transformation. . . . That inner change, under the pressure of a powerful experience, universally shared, is the prelude to every significant outer change." (*The Condition of Man*, p. 394.) But he leaves us entirely in the dark regarding "the powerful experience" itself. He confesses that rational demonstration is powerless to bring it about. What then can do so?

II.

The fundamental illusion, which seems to be common to all the secular sociologies, is the assumption that the creation or the changing of social values is a self-contained process, quite independent of prior belief or doctrine. The sociologists of the half-way house are urging a return to values which grew out of faith in a revelation, about which, however, they are either silent or unsympathetic. They are labouring under the delusion that the social values, recovery of which they so sincerely desire, can be detached from the beliefs in which they are rooted, theologically as well as historically. This is like believing that roses have a life of their own independent of the tree from which they have been cut; that the bloom they enjoy on the tree can be transferred in perpetuity to the rose-bowl on the dining-table. They seem to think that the temporary shelter in which they have found refuge can be made into a permanent home. They apparently take for granted that it is within modern man's capacity to erect what is, in effect, a Christian civilisation on a basis of secular belief. There is no realisation of the vital,

organic relation between Christian values and Christian doctrine; that social ideals and principles are derivatory, and not fontal and primary. The pursuit of Christian social values, dissociated from the theology out of which they derive their existence and nourishment, is a pursuit of phantoms; a foredoomed attempt to isolate the shadows from the sun. Here is the immediate secularist strong-point on to which Christian theology must direct its attack. Here is the practical issue which emerges for the Church out of our survey of current social philosophy.

My confidence in the soundness of this conclusion is considerably fortified by a recent work of Mr. C. S. Lewis, *The Abolition of Man*, from which I quote: "This thing which I have called for convenience the *Tao*, and which others may call Natural Law or Traditional Morality or the First Principles of Practical Reason or the First Platitudes, is not one among a series of possible systems of value. It is the sole source of all value-judgments. If it is rejected, all value is rejected. If any value is retained, it is retained. The effort to refute it and raise a new system of value in its place is self-contradictory. . . . What purport to be new systems or (as they now call them) 'Ideologies,' all consist of fragments from the *Tao* itself, arbitrarily wrenched from their context in the whole and then swollen to madness in their isolation, yet still owing to the *Tao* and to it alone such validity as they possess. If my duty to my parents is a superstition, then so is my duty to posterity. If justice is a superstition, then so is my duty to my country or my race. If the pursuit of scientific knowledge is a real value, then so is conjugal fidelity. The rebellion of new ideologies against the *Tao* is a rebellion of the branches against the tree; if the rebels could succeed they would find that they had destroyed themselves. *The human mind has no more power of inventing a new value than of imagining a new primary colour, or, indeed, of creating a new sun or a new sky for it to move in.*" (My italics.)

Now, if instead of the word *Tao* we read the word *Revelation*, the significance of this becomes clearer. Christian faith is the revelation in Christ of what God is in His own being, character and relation to mankind. Christian social values are the reflection of that revelation in human relations and social institutions. Dogma is the affirmation of what is, of what is the nature of absolute, transcendent Reality, which determines what shall be our social values, our principles. Values are not a casual creation

of the human mind, to be adopted in accordance with what we may happen to think good or desirable. It is values that decide what we think of as good, and our values, which dictate the character of civilisation, are determined exactly by what we believe about the nature of Reality, of God. Changes in social values cannot be effected on the historic level, merely on the level of human reason and organisation. The source of the process of change in values goes back to what we believe about God, not as the result of an operation of logic, but as the result of an act of pre-rational acceptance. The Christian revelation —or Word—of God confronts man with a demand for a Yea or a Nay, as something to be accepted or rejected ; not as something to be logically investigated, tested, weighed in terms of pros and cons and finally adjudicated. We either accept what Christ manifests of God or we don't. Reason is incapable of deciding the truth or falsity of that manifestation in the first place. The values determining the social process are an involuntary consequence of our initial acceptance or rejection of Christ's Word about God. Theology precedes and determines sociology. Theology affirms elemental existence, being. Sociology affirms derived existence.

Now, the reaction of secular philosophy to this argument (or position) is to despise it as an attack upon reason. The charge that Christianity constitutes an attack upon reason frightens the theologian so much that he becomes merely apologetic. Theologians are even yet too flurried to make clear the distinction between reason as an instrumental function of experience and reason as the supreme arbiter of basic being, of elemental reality. What Christianity does involve, emphatically and indubitably, is an attack upon the pretensions of reason, upon reason inflated with the assertion of its own omnipotence. When reason claims to be able to decide, for instance, the question of the very existence of God, then it is laying claim to omnipotence. It is affirming its own deity. That is what theology must reject lock, stock and barrel. It must affirm the incompetence of reason to decide the verity, the prior timeless verity, of revelation. What theology spurns is the pretensions of reason.

The claim of reason to adjudicate on revelation fails to substantiate itself in the purely secular field of experience. Mr. C. S. Lewis makes this point with conclusive force. By claiming to go beyond " first principles," knowledge itself ceases to be

possible. By carrying rationalism to the nth degree, the world is reduced to irrationality. If reason is to be reliable as an instrument of experience, there must be a point at which it stops. If it goes beyond that point—first principles, postulates, anxioms, or what you will—the very possibility of reason vanishes. As Mr. Lewis puts it, by "seeing through" everything, it finally sees nothing. "... . extreme rationalism, by 'seeing through' all 'rational' motives, leaves them creatures of wholly irrational behaviour . . . you cannot go on 'explaining away' for ever: you will find that you have explained 'explanation' itself away. You cannot go on 'seeing through' things for ever. The whole point of seeing through something is to see something through it. It is good that the window should be transparent, because the street or garden beyond it is opaque. How if you saw through the garden too? It is no use trying to 'see through' first principles." (*Abolition of Man*, pp. 33 and 40.) What therefore divides the Christian theologian from the secular philosopher is not whether revelation is or is not subordinate to reason, but whether revelation shall be immune to the corrosive of reason.

Hence the struggle over social values, and personal values too, is supremely and directly a theological struggle, since it is theology that decides. This discovery transforms the whole situation of the Church in the modern world, which ought to transform also the long-established inferiority psychology of the Christian ministry in relation to the world—to the nihilistic sociologies which frankly abandon civilisation to the devil in the garb of totalitarianism; to the superficially rationalistic sociologies which turn a blind eye on their own fundamental assumptions; to the half-way sociologies, which pull up midway in their pendulate swing, and thus conclude (if I may vary the metaphor) by being "neither fish, flesh, fowl nor good red herring." In this situation, theology can begin to walk with a swagger.

The problem now is not the survival of the Church, but the survival of European civilisation. Before another decade has passed, the problem of even the physical survival of any sort of civilisation may find its way to the agenda-paper of history. The atomic bomb announced a grim and sinister possibility. "My concern," said Pastor Niemöller in his famous interview with Hitler in 1934, "is not the Church, but the Third Reich." "You can leave that to me," replied Hitler. Eleven years and the Third Reich is no more. Is that a parable of things

to come? I do not know. What I do know is that secular civilisation can no longer be left to a secularist sociology of any kind, if disaster is not to intervene. "War is too serious a business to leave to the Generals" (Clemenceau). So is civilisation. The Church has a tremendous stake in the historic process, in social development. The hour has struck for theology to become aggressive. So "to your tents, O Israel."

870TH ORDINARY GENERAL MEETING

HELD AT 12, QUEEN ANNE'S GATE, WESTMINSTER, S.W.1, ON MONDAY, 24TH MARCH, 1947.

KENNETH WALKER, ESQ., M.D., F.R.C.S., in the Chair.

The following elections have been made: T. A. Hogg, Esq., Life Member.

THE SPHERES OF REVELATION AND SCIENCE. WHAT ARE THEIR LIMITATIONS IN RELATION TO EACH OTHER?

THE GUNNING PRIZE ESSAY 1946.

By R. E. D. CLARK, M.A., Ph.D.

I

IN the middle ages knowledge was a unity. Every branch of science was interpreted in terms of Theology, the queen of sciences. Free speculation was, indeed, allowed but only on condition that hypotheses that did not fit into the general framework were to be regarded as amusing pastimes rather than as sober truth. Men were free to work out the consequences of a heliocentric system in astronomy if they wished to do so but they were not free to say that the heliocentric system was true and the geocentric false. To adopt such an attitude was to set oneself up against the teaching of learned theologians and was therefore an indefensible act of pride. The task of the investigator was to invent hypotheses to "save appearances" (*salvare apparentias*), that is to say to cover the observed facts adequately, not to provide explanations of the nature of things (*in esse et secundum rem*).

Modern science was born when men like Bruno and Galileo boldly asserted that their hypotheses were not *mere* speculations but that their studies were actually leading to ultimate truth. It was this claim that at once produced friction with the church. In addition, the church has always stood for a policy of secrecy.

Speculations, even if they were not asserted to be true, could be published only for the benefit of learned men. Attempts to bring them to the attention of the masses were forbidden lest they should prove dangerous in undermining the church's authority. Much of the early friction between science and religion was caused by the fact that men of science had the temerity to assert, not only that experiments and observations could lead men to truth, but that truth, once discovered, was to be made available for all.

As Sir Henry Dale has pointed out,[1] the fact that science won one of its first great battles against the policy of secrecy, is not irrelevant to the situation in our modern world. Today, as in time past, we find that certain scientific ideas are regarded as dangerous by the politicians, so that there is once again a determined attempt to reimpose secrecy. What the outcome of the present struggle will be we do not yet know. but many leading men of science are reaching the conclusion that the welfare of science is once again at stake.

We have seen that, until the beginning of the modern era, theology had everything her own way. She knew no limitations. She claimed an absolute right to insist that the view-points in all other subjects should be so adjusted that nothing should conflict with the dictates of the Church. Science, on the other hand, had no real freedom. The man of learning was free to speculate for the sake of speculation alone, he was not at liberty to claim that his speculations corresponded with reality unless they were also in agreement with the doctrines of the church.

Into this world the scientific renaissance introduced what must then have appeared to be as a fundamentally new approach to knowledge. Our outlook has now altered so greatly that it is difficult to realise the degree of originality involved.

When, today, we begin the study of a new branch of knowledge we often try to examine the facts before us in what we call an "unprejudiced" way. By this we mean that we must make a deliberate attempt not to carry over from our previous studies a large number of preconceived notions into which the facts can only be made to fit with the aid of a good deal of "special pleading." Rather than "teach" nature how to work, we try to let nature "teach" us.

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[1] *The Mission of Science.* Presidential Address to the Royal Society, Nov. 30, 1945.

This attitude has become thoroughly ingrained in our manner of thinking. Even among people who profess no academic outlook, it has become almost proverbial to say that facts are more important than theories, which is, of course, an expression of the same idea.

When we examine the matter in further detail, we find that there have been several phases in the development of the new approach. In their early days the various sciences developed more or less independently. The fundamental ideas of mechanics, of magnetism, of electricity, and of chemistry were each chosen in such a manner as to make the actual facts of these respective sciences as intelligible as possible. It did not matter if, for instance, the attraction of magnets for pieces of iron, or of the earth for the moon, seemed unconnected with the attraction of hydrogen for oxygen. Forces of attraction and repulsion, ethers to convey these forces, magnetic poles, electric charges, unconnected units of mass, length and time, new types of valency binding atoms together, and many other things, were simply invented *ad hoc* as and when required and their appropriate laws were then determined. In this early phase, little or no attempt was made to prevent the multiplication of arbitrary starting points for scientific explanation. A scientific worker was free to postulate a magnetic pole simply because the properties of magnets could best be described in terms of such poles: he did not come to the study of magnetism imbued with the principles of mechanics and determined, at all costs, to explain the force between two magnets in terms of a rate of change of momentum.

At a later stage a reaction set in. By the middle of the nineteenth century it was recognised, wisely, that if new principles of explanation were allowed to multiply indefinitely, science would, in the end, cease to explain anything at all. In consequence it came to be regarded as highly unorthodox to introduce even one new entity or principle of explanation. It was implicitly assumed that the first investigators of science had discovered all the basic principles that could possibly exist and any innovator who tried to introduce another was at once met with the well-worn Latin tag: "*Entia non sunt multiplicanda praeter necessitatem*" (entities must not be multiplied beyond necessity)—the principle usually referred to as "Occam's razor."

But entities had already been multiplied beyond necessity—

beyond necessity, at any rate, in the light of later scientific developments. As science advanced, the various pigeon-holed ideas upon which it had been founded were extended in various directions and, at length, inevitably, the different branches of science began to impinge upon one another's spheres of interest.

The results of this " clash " between the sciences are now well known[1]. The propagation of light could only be explained by supposing that light consisted of vibrations in an ether which had a density of a million million times that of water and a rigidity much greater than that of steel. Magnetism also required an ether, but this ether had to be pictured as capable of streaming along tubes of force and so was entirely devoid of rigidity. It is hardly necessary to discuss the subsequent history of these theories here. The important point is that, at first, the various branches of knowledge, each making use of concepts invented for its own benefit alone, led to contradictory results as the various lines of enquiry were independently pursued. What happened at the end of the 19th century, was only an example of what has happened many times, both before and since, and of what is, in fact, still happening.

In a sense the " clash " between the sciences is closely parallel to the " clash " between science and religion. As Professor Dingle has ably urged[2], the languages of modern science and of religion are both attempts to describe and explain our experiences in the terms which seem most appropriate to the study at hand—sense data and religious experience. It is not unlikely, therefore, that when these studies are pursued, borderline cases will be discovered in which, at first sight, disagreement is apparent. Such disagreements become possible when religious and scientific explanations of the early ages of the world, of apparent recorded miracles, of unusual events involving the minds of men (*e.g.*, the conversion of St. Paul), and put forward from the two different points of view.

However, just as the disagreement, between the various sciences, has often been reconciled by subsequent, and more extended examination, so the religiously minded person has usually felt that, if all the facts were known, no disagreement

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[1] See E. T. Whittaker, *History of the Theories of Aether and Electricity*, 1910.

[2] H. Dingle. *Science and Religion* (Union of Modern Free Churchmen), 1945.

between science and religion would ultimately remain. The doctrine that such an inconsistency is ultimately inconceivable, has, indeed, received a great deal of support from the surprising, and indeed wonderful, way in which unification between some of the sciences has already been effected. It is this fact which, to many minds, makes the "modernist" approach to the Bible seem unreasonable. The "modernist" theologian gives the impression that whenever he finds an apparent inconsistency he feel that it is the duty of the religious part of him to retreat. If the religious explanations of the early ages of the world or of the psychology of the religious life clash with the best conjectures of present day science—well, it is taken as a sure sign that religion, and not science, is transcending its proper limits. The Christian is told that he must be humble enough to admit that he has used his religious concepts in a sphere to which they cannot be applied. But if theology and science are both attempts to describe and explain experiences, why should religious explanations alone be confined rigidly to their own field? If disagreements result—need they disconcert us more than do the numerous disagreements between different branches of science? How does the "modernist" come by his mysterious conviction that further knowledge will not result in perfect reconciliation?

II

Thus the development of the physical sciences in reality gave rise to two schools of thought—only it chanced that the two schools were not contemporaneous but historically separated. First of all there were those who insisted that, when a new subject was being studied, it was legitimate to allow the subject itself to dictate what ultimate units of thought would have to be used in its development. Later, as the principle of "Occam's razor" came to be ruthlessly applied this policy was reversed. Instead of inventing new entities, desperate attempts were now made to explain the new in terms of the old.

Both these points of view had their influence upon the newer non-exact sciences—but here the two schools of thought have for long existed side by side. As we shall have to refer to them frequently, we shall, for want of better terms, refer to them as the *mechanistic* and the *ad hoc* points of view respectively.

According to the first, or *mechanistic* view, biology, being a complex subject, can only be understood in terms of the simpler

ideas of physics and chemistry. The biologist has no right to invent *ad hoc* categories of thought to explain phenomena in which he happens to be particularly interested. This point of view was, of course, that adopted by the naïve materialist for whom man was simply a machine, complex perhaps, but a machine for all that.

According to the second or *ad hoc* point of view the biologist has perfect freedom to introduce whatever fundamental principles will best explain the facts with which he has to deal. The right to do this has, of course, been claimed since early times—we find it in Aristotle's *entelechy*, in all classical systems of logic and ethics and, in our own age, we see its influence in the form of the various life forces, instincts, etc., which have been postulated times without number.

In the earlier part of the present century there was a tendency for the more unemotional and disciplined thinker to show an active dislike of the *ad hoc* point of view. It was claimed, and claimed rightly, that it tended towards undisciplined thought. It was always easy enough to postulate a psychic entity arranging molecules in the body, to explain sleep by a dormative principle or to dismiss conduct in terms of instincts, but how could such unbridled speculation be subjected to any tests whatsoever? Were not all these supposed explanations mere verbal ways of restating the original facts in polysyllabic words? If physics and chemistry cannot yet explain the obvious facts of biology which call aloud for explanation, may this not simply be because the latter science is still in its infancy?[1]

Despite the cogency of these objections, there have always been many biologists who were prepared to ignore them and recent developments in the physical sciences have, apparently, greatly strengthened their position. Today it is at last possible to see the early development of science in its historical perspective. We can now appreciate how the various physical sciences, leading to different and apparently inconsistent sets of fundamental ideas, have been combined by the principle of relativity. Magnetic forces, postulated to explain the phenomena associated with magnetism, are now seen to be a property of electricity in motion. Chemical affinity, invented to explain the combination

[1] Compare the scathing and amusing denunciation of much *ad hoc* scientific thought in E. B. Holt's *Animal Drive and the Learning Process*, 1931.

of chemical elements, turns out to be none other than the familiar force associated with the interaction of electric charges. Statistical mechanics have shown that the two concepts of *amount of heat* and *temperature* can be derived from the ordinary laws of mechanics.

In these and numerous other instances we see how different sciences have created their own concepts and have developed the laws of connection between them. In the first place the concepts were of an *ad hoc* character, but, in time, they were seen to be consequences of other and more fundamental branches of knowledge.

Facts of this kind have naturally encouraged the biologist to do what has already been done so successfully in other fields. Accordingly, he is today more insistent than ever before that he has a right to choose the concepts which he finds most convenient in his work and to leave to future scientific workers the task of reconciling his newly invented concepts with the established principles of science.

Thus *ad hoc* science has received a new lease of life. As examples of its development we may cite the psychology of Freud, with its welter of *ad hoc* concepts (*unconscious mind, ego, id, libido, complexes, etc.*) ; the idea of *gestalt* in experimental psychology around which a vast literature has already grown up (Thorndike, E. S. Russell, Köhler, Koffka, etc.) ; the *entelechy* of Driesch postulated to explain the development of the embryo, the idea of *organism as a whole* developed by J. S. Haldane and of *teleology* in nature (to be taken as existing alone without any implication of a plan or mind at the back of nature) sponsored by L. J. Henderson. Finally, mention should be made of the idea of *evolution* which also cannot at present be correlated with non-biological principles.

In these and many other instances we find that men of science have boldy invented *ad hoc* concepts and have attempted, with varying degrees of success, to discover the laws connecting them with one another. But in nearly every case they have been content to shelve fundamental questions as to the nature of the new concepts which have been so easily, and often uncritically, introduced.

The new drift towards *ad hoc* science has naturally produced a corresponding philosophy. In this connection the *holism* of General Smuts and more especially important still the *emergent evolution* of Lloyd Morgan must here be mentioned. According

to the last named theory we must conceive of nature as a series of hierarchies. The lowest level is that of atomic nuclei and electrons. These produce atoms, these molecules and these crystals. "Liquid crystals," complex liquid, fat and carbohydrate molecules and, finally, living matter, form yet further representatives of organisation levels. Living matter itself, starting with the most simple forms and passing upwards until we reach the mind of man, provides the more developed subdivisions of the hierarchy. At each level, so we are told, scientific laws appropriate to that level may be found. Some of these laws, so Morgan says, are deducible from the laws of matter found to hold at a lower level, but many are not and then the laws can only be discovered at the levels, or on levels still higher than those in which they begin to operate.[1]

In the so-called philosophy of dialectical materialism we find a closely similar attitude. Engels and Lenin had no patience with traditional materialism.[2] They claimed that when a physical quantity (heat, light, complexity, etc.) is gradually increased in a system, there must come a time when a new and unpredictable phenomenon is suddenly encountered. This is, of course, a statement of the Hegelian law that "quantity turns into quality" and on this view life is simply a property of chemical molecules which have a certain degree of complexity.

III

We have now considered two of the three possible attitudes which a scientific worker may adopt towards a new branch of study. When we ask questions about the limitations of science, it is obvious that we must first of all possess clear ideas as to what we mean by "science." If, on the one hand, our approach is primarily mechanistic, we shall very soon find that science is faced with limitations when it seeks to advance into new fields of investigation. Not only will limitations of a purely practical

[1] The physical examples Lloyd Morgan cited in order to illustrate these assertions were generally unfortunate. Thus, he was of the opinion (Gifford Lectures. *Emergent Evolution*, 1923, p. 66, etc.) that no amount of study of single atoms would enable us to predict the way in which they would group together to form a crystal or a liquid at a lower temperature. The very thing which Lloyd Morgan deemed to be impossible has since been accomplished. A study of the deviations of gaseous argon from the classical gas laws has enabled the exact positions of the atoms in the crystal lattice to be predicted successfully.

[2] See F. Engels *Dialectics of Nature*, 1940, etc.

kind be encountered immediately—for our science may be at too early a stage of development to enable it to deal with complex phenomena—but there will also be the much more fundamental difficulty that it will be unable to deal with sets of ideas of an unfamiliar character.

If, on the other hand, we are always prepared to adopt the *ad hoc* approach in science, it is clear that our science can know no limitations whatsoever. No matter with what phenomena we are dealing, it will always be possible to invent suitable categories of thought for the sole purpose of describing these phenomena and, if we can find (or think we can find) relations of any kind between the concepts so facilely invented—well, they constitute the embryonic form of a developing science. Clearly even religion is not immune from such treatment. The old mechanistic science was disposed to argue away the existence of spiritual values, the newer *ad hoc* science is simply prepared to accept them at their face value.

We must now consider briefly a third attitude which we may adopt towards a new line of scientific enquiry—the attitude implied by the word *positivism.*

According to the doctrine known as *positivism,* we can never know the real world behind appearances. All we should do, therefore, is to confine our attention to the things that we *do* know, the *sensa* of experience. It is useless, in physics, to try to find out anything about the ether, so we must express all our facts in the form that observers would see them and this involves giving up the idea of a velocity of an electromagnetic wave with respect to the ether. Similarly we cannot know, because we cannot determine, the precise position or velocity of a small particle so we must express ourselves only in terms of probabilities which, by taking a sufficient number of observations, can actually be measured.

Positivism has long had a certain vogue but the new developments in physics—though they have hardly tended to revive Mach's thoroughgoing scientific positivism—have had interesting repercussions on anti-theological thought. Many writers and thinkers are beginning to state quite blatantly that since man cannot reach the ultimate truth about things, spiritual values must just be accepted as we find them without asking any questions as to where they come from or how they arise. Olaf Stapledon[1],

[1] O. Stapledon. Essay in *Freedom of Expression.* Ed. H. Ould, 1945. p. 16. See also *In Search of Faith* Ed. E. W. Martin, 1943, etc.

for instance, compares these values to the primitive beliefs about the stability of the earth. We can accept the earth, he says, without having to believe that it rests upon the back of a tortoise which is, in turn, squatting on the back of another tortoise and so *ad infinitum*. So why not accept spiritual values without asking questions as to their origin ?

Precisely the same point of view has been put forward repeatedly with regard to the universe[1]. If we follow the tradition of positivism it becomes quite illegitimate to ask where the universe came from or how it was created. The only relevant fact is that the universe is here, so that there is no need to ask where it came from. In the same way teleology in nature can be accepted without attempting to account for its origin.

In recent years even right and wrong have been defined in terms of their influence upon evolutionary progress—a right course of action being of assistance to evolution and *vice versa*[2]. In this way the unobservable principles of right and wrong can be eliminated and in their place we are simply left with observable (or potentially observable) effects on evolution.

For the same reason it is often asserted[3] that the old discussions about mind and body are now completely out of date. No longer is it necessary to ask whether scientific evidence supports the view that mind is a spiritual entity inhabiting a material body, for from the modern point of view such a question is completely meaningless. Positivist science must confine itself to tangible things : the phenomenon of mind is definite enough but it is unscientific to invoke intangible souls and spirits which may prove to have no more objective existence than the 19th century ether. To ask questions about discarnate minds is to come to nature with preconceived ideas whereas the true investigator should keep his mind open and be prepared to learn from nature, not to force nature to conform to pre-arranged grooves of thought. "The chances are thousands to one that all our most carefully conceived ideas on these subjects are more false than true."[4]

[1] See, for example, H. Levy, *The Universe of Science*, 1932. Also H. Dingle, *Through Science to Philosophy*, 1937 and *The Laws of Nature*, (*Nature*, 1944, 153, 731, 758).

[2] C. H. Waddington, *Science and Ethics*, 1942.

[3] For example by W. W. Carington, *The Meaning of Survival*, Myers Lecture, 1935. Also by behaviourist psychologists in general.

[4] O. Stapledon in *Freedom of Expression*, *Vide supra*.

IV

From this discussion it will be seen that the *ad hoc* and the *positivist* attitudes towards science may both serve for the repudiation of theological ideas and, in point of fact, we often find that the two attitudes are held together in a single person's mind while both are supposed to represent the culmination of 20th century scientific thought. But, for all this, they are strange bed-fellows as we shall shortly see. The only real agreement between them lies in the fact that both of them enable people to avoid all discussion of the old problems of science and religion. Souls, discarnate spirits, freewill and the Deity Himself are unnecessary postulates if we are at liberty to invent *ad hoc* causative principles which operate only at the levels of organisation at which they are invoked. They are equally objectionable if it is the duty of the scientist to keep his science free from unobservables.

Nevertheless, despite the superficial agreement, the *ad hoc* and *positivist* attitudes are really mutually contradictory. This is at once obvious when we reflect that such ideas as *unconscious mind, psychological complex, evolution,* and many other similar concepts refer to things which are unobservable and should therefore be repugnant to the positivist. It is difficult indeed to resist the conviction that many modern writers use which ever of the two attitudes best serves the purpose of the moment when they wish to discredit theology. Professor J. D. Bernal's remark to the effect that " the invocation of God . . . . just because it can be done when faced with any intellectual or moral difficulty whatever removed any necessity for a rational treatment of the world "[1] is every bit as much a criticism of *ad hoc* science as of theology. Yet the *ad hoc* scientist often thoughtlessly repeats the criticism.

V

We have seen that both *ad hoc* and *positivist* science are all-inclusive schemes of thought which by their very nature can know no limitations in respect of theology or of any other branch

[1] *Aspects of Dialectical Materialism,* Watts, 1934, p. 92. Bernal is careful to explain that his criticism applies to many forms of science as well as to theology.

of study. The first invokes new principles as required, in order to explain phenomena in complex cases and in this way it succeeds in avoiding ultimate issues. The pious hope that a future Einstein will one day discover the fundamental relations between the new ideas and the old is a hope only and, as we shall shortly see, it is a hope that can never be realised. *Positivism*, on the other hand, avoids the asking of fundamental questions by the simple expedient of denying that they are of any interest and insisting that attention should be focused entirely on the things of sense. It is all-inclusive because it denies the existence of theology.[1]

The deficiences of these types of science are such that we may well ask why they have become so popular, seeing that neither of them really achieves the most fundamental aim of science —the satisfaction of human curiosity.

The reason is probably to be sought along the following lines. In the present century mechanistic science has reached an *impasse* —a fact freely admitted by nearly everyone today. The early hope of the materialist that mechanistic science would prove all-embracing has turned out to be false for its limitations have become obvious in a number of directions. The discoveries of the past twenty years have, in fact, made it practically impossible to conceive that any possible modification of the old science will enable it to explain all phenomena.

In this connection the work on the brain initiated by Lashley is particularly relevant. At one time it seemed possible to conceive of the brain as an enormously complex telephone exchange. Experiences made more or less permanent connections between the "wires," thus setting up "conditioned reflexes." Today this view is universally considered to be quite untenable. If memory is dependent upon connections between nerve fibres then, when the brain is partly destroyed, the fibres connected with a particular reflex, should either be disconnected or not disconnected. Now if a rat learns how to extricate itself from a particular maze, and a part of its brain is then destroyed, the memory loss is found to be dependent upon the *amount* of destruction and *not* upon the position of that destruction. Again, in man, there is only one part of the brain in which there is a rigid point to point connection between sensory fibres

[1] For a methodological type of positivism in which this is not the case, see later, p. 157.

and the cells of the brain, and that is in the occipital region, the cells of which are individually connected with the rods and cones of the retina. Yet, even here, when a squint develops, or when one half of the retina is destroyed, the mind can reorganise the entire meaning of the impulses which reach the brain, despite the fact that the physical connections remain unaltered.

Facts of this kind, to which we should add the experimental proof of telepathy in recent years, show only too clearly that mechanistic thought is unlikely ever to explain even the simplest mental phenomenon, let alone the existence of spirtual values or the sense of right and wrong. Bearing in mind the long history of enmity between science and religion that was stirred up in the latter part of the 19th century, it is natural enough that rationalistic scientists of today have abandoned mechanistic science which, by its very failure, obviously opens the door widely for the entry of theological ideas. It is no wonder that the *ad hoc* and even the positivist attitudes to science have found favour.

We must never forget, however, that in extending its scope in these ways, science is weakening its powers. *Ad hoc* hypotheses become increasingly of a purely verbal kind, affording no real understanding of the factors involved. Moreover, from the point of view of the traditionalist the new attitude is simply a case of special pleading. Instead of trying to find out whether such entities as minds do in fact exist apart from matter, it is pretended that all such questions are meaningless, whereas they are actually assumed to be untrue. The new attitude of empiricism is not what it professes to be—an attempt to let nature "teach" us. The *ad hoc* scientist is at least as guilty of coming to nature with his mind already made up as ever the traditionalist was.

VI

In the preceding sections we have examined, mainly without comment, arguments which can be brought forward in favour of the *ad hoc* and *positivist* attitudes in science. Since a study of the limitations of science is so largely bound up with the type of science under consideration, it will not be out of place if at this point some brief comments upon these arguments are introduced.

We saw in the first place that the *ad hoc* attitude can be justified by an appeal to the early history of physical science. Here *ad hoc* concepts have often ultimately become absorbed into the main body of knowledge and, in any case, progress would have been impossible without them. How far is this analogy justified ?

First of all it should be said, at once, that physics itself has not been unified to the extent that is commonly imagined. It is still impossible to understand how gravitational forces are related to magnetic and electric forces. Even when we come to those branches of physics which have been unified by relativity, it is important to notice that the unification is numerical only. The history of science shows how relatively easy it may be to get numerically correct results on the strength of false premises —the ancients were able to calculate the speeds of rotations of the heavenly spheres which were supposed to carry the stars and by this means they were able to predict astronomical phenomena successfully. In modern times, as O'Rahilly[1] has reminded us, the mathematical equations of modern electromagnetic theory can be derived from quite a variety of mutually inconsistent starting premises. By way of example it is well known that both corpuscular and non-corpuscular theories of electricity give rise to the same equations of flow when a relatively large amount of electricity is under consideration.

Physical science sometimes deals with concepts which are so far removed from everyday life and so difficult to correlate with one another, that the attention of the physicist is often devoted, not towards effecting a true unification of ideas, but towards achieving numerical agreement only. This is particularly the case in the well-known method of *dimensional analysis*. In this, after a physical phenomenon has proved too difficult for analysis, a mathematical method shows how its *magnitude* may be expected to vary when a change is made in the magnitudes of the various physical factors with which it is supposed to be connected. Remarkable numerical predictions are thus obtained but the agreement throws little light upon *how* the phenomenon in question occurs. For instance, we may discover by dimensional analysis, that the drag on a ship moving through the sea will vary with the square of its velocity but we

[1] A. O'Rahilly, *Electromagnetics. A Discussion of Fundamentals*, 1937.

may still be in the dark as to why there is any drag at all. Only in a very Pickwickian sense can it be said that a problem solved by a dimensional method is a true unification of science.

Now relativity is a special case of dimensional analysis.[1] It ignores the true physical connections between various branches of science but, by a mathematical device, it shows how correct magnitudes of physical quantities can be calculated. This is the true significance of Einstein's achievement and, looking at the matter from this point of view, we can at once see how foolish it is to suppose that the theory of relativity will ever have its counterpart in biology. Few, indeed, of the new *ad hoc* ideas of the inexact sciences provide us with anything that can be measured and so it becomes impossible to understand how any future investigator will ever be able to side-track the scientific connections between them and the older science, and confine his attention to measurements.

Of course, all this is no argument against *ad hoc* science as such. It would certainly appear that an *ad hoc* approach to reality is often necessary, and indeed unavoidable, though some will prefer not to use the word "science" in connection with knowledge obtained in this way. At all events, if we build up a system of knowledge based upon *ad hoc* ideas, we must learn to recognise it for what it really is—a mere gleam of light in an all-prevailing darkness. Moreover, we must never forget that if knowledge gained by the *ad hoc* method is to be dignified by the term "science," then we also have every right to speak of theology as a science, for theology also demands that we should recognise and use a set of concepts suited to its own field.

It is profitless, of course, to debate the meaning of mere words: the important point is that *if* we use the word *science* to cover the inexact as well as the exact sciences, we must remember that the meaning of the word is not the same in the two cases.

Nowhere, perhaps, can this difference in the meaning of common words be better illustrated than in connection with the study of causation.[2] Let us suppose that a physical experiment which involves, shall we say, the flow of a liquid through

[1] J. Mackaye, *The Physical Cause Back of the Relativity Equations.* Journal of the Franklin Institute, 1934, 218, 343. In this connection the interesting criticism of relativity by A. Eagle (Trans. Victoria Inst., 1938, **70**, 177) should be noted.

[2] See R. O. Kapp, *Science versus Materialism,* 1940, p. 202 ff. for an able discussion of the meaning of causation and explanation in scientific thought.

a tube, is carried out in the laboratory. A mathematical analysis indicates that the flow should take place at a certain rate but experiment shows that the actual rate differs from that calculated by a significant amount. What is the attitude of the exact scientist to this result? Does he claim to have explained the phenomenon on the ground that he can put forward various plausible suggestions as to the factors which ought to be considered? Of course he does not. He admits candidly that the phenomenon cannot yet be explained.

The *ad hoc* scientist, on the other hand, claims to have explained a phenomenon if he can show, even in the vaguest way, how it might be connected with other factors. In sociology, biology, and most forms of psychology, there is no pretence whatever at numerical agreement: it is enough to point to certain antecedents and it is not even considered necessary to say why these supposed causes should have produced what, in fact, they did produce and not something totally different. The existence of man, for instance, is explained on an evolutionary basis but no one asks why man as we know him and not some totally different creature was formed: far less is an attempt made to show that an evolutionary process would necessarily produce men of a particular size. Biological "explanation" is clearly what the physicist would describe as a lack of explanation. The word *explain* is used in different senses in the exact and inexact sciences.

Again, this is not of course said in criticism. Biological problems are so complex that little better could be achieved in any case. The mistake that has been made is one of *attitude*. The *ad hoc* scientist sometimes lacks a sense of humility: he takes over the words of the exact sciences and forgets their original meaning. He fails to notice that even the best explained fact of biology must, from a physicist's point of view, be regarded as unexplained.

The different language employed by the two kinds of science is confusing to the layman. In some instances the old language of the exact sciences seems to have been taken over quite deliberately to create such confusion—rationalist writers at all events frequently trade on the confusion. All arguments to the effect that science can explain, say, religious experience or some historic miracle, are at root dishonest attempts to make the public believe that the word "explain" here has the very definite meaning that it possesses in the exact sciences, whereas

those who make these claims should know very well that this is not the case.

Of course if, by *explain*, we only mean that we can suggest antecedent partial causes, no dishonesty is involved. In this limited sense we commonly "explain" the acts of a criminal by pointing out that he did not have a fair chance in life owing to his bad home conditions. Again, we "explain" the conversion of St. Paul by saying that, after watching the heroic death of Stephen, his unconscious mind must have been hard at work and that a sudden realisation that he was "kicking against the pricks" was not unlikely to occur in the case of so intelligent a man. All "explanations" of this kind are legitimate in their way, provided we realise fully what we mean by "explanation." If our ideas on this point are clear we shall not be tempted to argue that other causes must be excluded—we shall not be so self-satisfied as to suppose for one moment that our tentative suggestions imply that the criminal was not responsible for his acts or that God did not reveal Himself to St. Paul at an opportune moment.

The degree to which people can become satisfied with a fragmentary explanation is often quite surprising. It is worth while pointing out that even in physics no one would think of arguing in so careless a manner. If we discover that the period of oscillation of a drop depends on the radius of the drop raised to the power of one and a half, we do not dream of supposing that the radius "explains" the period or that other factors, such as the physical properties of the liquid out of which the drop was made, are not involved. Thus scientific explanations often cannot be treated as comprehensive even when exact numerical agreement with prediction is obtained. We should naturally be all the more on our guard against a claim to understand every factor involved when we are dealing with inexact sciences and *ad hoc* concepts.

Another point, all too little realised, is that by employing scientific concepts at all, we are selecting material for which scientific explanation is possible. To use a well-worn analogy due to Eddington, we do not expect a fisherman with a net of very large mesh to argue that there are no small fishes in the sea because he never catches any. No more can we discover truths about a spiritual world if our methods of investigation precludes them from the start. And this is precisely what the

modern *ad hoc* method is deliberately designed to do. Lloyd Morgan is honest enough when he says: "From a strictly emergent point of view any notion of a so-called 'alien influx into nature' is barred."[1]

However, provided all these points are kept in mind, there is no reason why certain types of *ad hoc* science should not be welcomed by the Christian. Nor can we set any bounds upon such science which may freely invade the field of theology and revelation if a clearer understanding is thereby attained. When God has seen fit to reveal His truths to men, we may be sure He has not done so arbitrarily—often, as in the conversion of St. Paul, the way is prepared by antecedent factors which it is the business of science to discover. It is not science itself but the fantastic and ill-thought out claims that are often made in its name that merit opposition from all reasonable men.

VII

Something may now be said about the doctrine of *positivism.* According to the positivist, modern physics has shown us that it is not possible to reach the "absolute truth" about what lies at the back of nature. We should not, therefore, waste time in attempting the impossible: we should confine ourselves to discovering relations between things which we can actually observe.

This argument rests on a failure to distinguish between measurable and purely qualitative truths. No statement of the value of an incommensurable number, such as π, is absolutely true, but it *is* absolutely true that the ratio of the circumference to the diameter of a circle is constant in a two dimensional world. Similarly, statements about function and form may often be absolutely true—a correct statement of the function of a kidney or the structure of glucose will remain true for all time. It is only when we seek the answers to purely numerical questions, such as, for example, "what is the velocity of the earth through the ether?" that we find that we cannot reach answers which are true for all observers.

Again, as Max Planck and Bavink have pointed out,[2] the positivism of Ernst Mach and his followers only ended in

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[1] *Emergent Evolution*, p. 13.

[2] See B. Bavink, *The Anatomy of Modern Science*, 1932, p. 31 ff.

scientific stagnation. The chemist Ostwald, even so late as 1904,[1] was arguing that since atoms were not observable, science must do without them. With great ingenuity he tried to show how Dalton's classical proofs of the atomic theory could be understood in terms of the facts of observation alone. But the existence of atoms was soon confirmed without a possibility of doubt. The amazing faith of the organic chemist who had not hesitated to draw plans of thousands of complicated organic molecules constructed out of unobservable atoms, proved to have been more than justified. Since that time every science can add scores of instances in which unobservable postulates were later found to have a physical reality.

Attempts have sometimes been made to separate observables into two classes, those *theoretically* unobservable (*e.g.*, motion through the ether) and those *practically* unobservable (*e.g.*, the back of the moon or the inside of the earth). It is claimed that physics is only concerned with the elimination of the first kind. A detailed discussion of this subject would be out of place here but it would seem to the writer that such a distinction assumes that we possess an infallible way of distinguishing between the two kinds of unobservables. We must not forget that until the beginning of the present century it was supposed that atoms and molecules, being far smaller than the wave length of light, were theoretically unobservable. Again, in our own day, the violent controversy which has been aroused by Milne's cosmological theories has largely centred round differences of opinion as to how various classes of unobservables should be classified.

The frantic attempts[2] which have been made by a few writers to restate the Machian heresy that science is only concerned with observable entities, nearly always breaks down when it is asked whether a star exists before it has been seen through a telescope. Interminable discussion as to the meaning of the word "exist" in such a case is profitless: the fact is that positivism is not a tenable attitude and even the philosophers

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[1] *Journal of the Chemical Society*, 85, 506.

[2] Professor Dingle, in his *Through Science to Philosophy*, never really faces this issue. Dr. Philipp Frank, who still bravely adheres to the positivist faith in his book *Between Physics and Philosophy* (1941), writes as if encumbered by unanswerable perplexities and frankly admits that very few, if any, scientific workers in the world, outside the original Vienna circle, agree with him.

and the very few scientists who sponsor it rarely or never apply it consistently. Few of them would, for instance, be prepared to consider a criticism of history or of evolution on positivist lines.

Thus, although we may willingly admit that positivism has a certain value when we are dealing with the purely numerical problems of physics, it would seem that there is little reason for extending the principle. Science, like religion, must often use the eye of faith and seek to peer into realms which lie beyond anything about which our senses can give us direct information.

One further remark on the subject of positivism may be made before leaving. Positivists may be of two kinds. Probably most of them would claim that all discussion of what lies beyond our senses is profitless. This is the variety of positivism which we have been discussing up to the present point. But sometimes we find positivists (Professor Dingle is an example) who claim only that *science* should not discuss an unobservable world but allow that religion has a right to do so.

As the grounds for believing in positivism are, in any case, so slender, this point of view hardly merits detailed discussion here. But it is of interest because this second type of positivism involves the view that science and revelation are confined to different realms. According to this view, therefore, science and religion must be kept in idea tight compartments of the mind and cannot impinge upon one another.

VIII

We must now turn to consider the sphere of revelation and its limitations, if any, with respect to science.

When, at the beginning of the scientific era, science first began to meet with conspicuous success in its attempts to explain the workings of nature, organised Christianity reacted towards it with a tragic lack of wisdom. At times attempts were made, by persecution and threatening, to restore the *status quo*. When that failed the church gave way on point after point.

A case[1] can be made out for supposing that the church systematically fought every new scientific idea which impinged, even in a remote way, upon theology or the Bible, until her opposition became so ridiculous that it had to be abandoned.

[1] A. D. White, *History of the Warfare of Science with Theology*, 1896, etc.

It has, however, been shown[1] that this interpretation is unfair. At any given epoch, radically new scientific ideas were always opposed to the prevailing science of the time and it was only natural that the church, in common with all other non-specialists in scientific matters, should have accepted the best available evidence of the time. Even in the case of the evolution controversy, perhaps the most bitter and tragic controversy that ever took place between science and religion, the battle was at first confined to powerful personalities in the scientific field and in no way involved religion.[2]

Whatever the historical truth on such matters may have been, the impression was created among the masses and deliberately fostered by rationalist propaganda, that the church was fighting a losing battle. The fantastic definition of a miracle as "an event that cannot be explained by science"[3] was exploited to the full. The rationalist press presented the public with the spectacle of science cheerfully explaining every new problem with which she was confronted, so that the number of events which could properly be called miraculous became fewer and fewer. Obviously science was conquering all along the line. Religion—once the proud possessor of all knowledge—was now, we were told, being forced to take refuge in one very small compartment of human experience—the part that deals with mysticism and religious intuition. And the science of psychology was already invading this sacred sanctuary. No reasonable person ought to doubt that it would ultimately be as successful here as it had been everywhere else.

Such is the picture drawn by the self-satisfied rationalist. We have already examined its falsity from the scientific side. We have now to examine the matter from the religious angle.

It is clear that religion has involved itself in difficulties through its attempts to find a rigid definition of miracle. To a discussion of this question we shall therefore now turn.

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[1] J. Y. Simpson, *Landmarks in the Struggle between Science and Religion*, 1925.

[2] C. E. Raven, *Science, Religion and the Future*, 1943, R. E. D. Clark, *Darwin: Before and After*, 1948.

[3] Unfortunately this definition has often been seriously put forward by Christians. Thus C. A. Row, in a well-known popular work of Christian apologetic, defines a miracle as "an event for the occurrence of which no forces, or combination of forces, is able to account," (*A Manual of Christian Evidences*, 10th ed., 1899, p. 8). Examples of such indiscretions could easily be multiplied.

At this point a consideration of the idea of causation in the Bible is of great importance. Throughout the Scriptures we continually observe that no systematic attempt is made to distinguish between the direct and the indirect working of God. Let us take a few examples, almost at random, from the Book of Psalms. God is the cause of storms (xxix); all nature is full of His loving kindness (xxxiii, 5); He created the heavens (xxxiii, 6) and now fashions the hearts of all men (xxxiii, 15); He sends calamities (lx, 2), rain and harvests (lxv, 9) and performs wonders for the sake of His people (lxvi, 6, lxxvii, 14, lxxviii, etc.); He provides food for the young lions when they roar after their prey (civ, 21); He has beset us behind and before and laid His hand upon us (cxxix, 5).

In the New Testament we encounter precisely the same outlook. We are frequently reminded that God showed His power throught the miracles of our Lord and that He finally raised Him from the dead. Nevertheless, according to the teaching of our Lord in the Sermon on the Mount, it is God who sends day and night, who clothes the lilies of the field and who sends His gifts of rain and sunshine upon the evil as well as upon the good.

From a study of these and similar passages the conclusion has been reached[1] that neither the ancient Hebrews, nor the Hebrew Christians of a later day, were familiar with our sharp distinction between the natural and the supernatural. This view certainly cannot be correct, for if this were really the case it is difficult to see why *particular* works of God—the plagues of Egypt or the resurrection of our Lord—should have been regarded as more significant than, shall we say, the clothing of the grass of the field. It is certainly clear that from time immemorial a distinction has been drawn, at least occasionally, between the natural and the supernatural. Even the Egyptian magicians (Ex. viii, 19) were prepared to say "This is the Finger of God" about certain events but not about others.

Nevertheless, the passages that have been cited certainly show that in the Hebrew-Christian tradition nothing like the stress was placed upon the distinction between the natural and the supernatural that came to be placed upon it in later times. The Bible says fearlessly that all events which are for the good of

[1] John MacMurray, *The Clue to History*, 1938.

man and beast are done by God. As a rule it does not attempt to distinguish clearly as to whether these events are performed by God in a direct or an indirect manner. Our Lord knew well enough that each day and night was not *separately* planned ahead by His Father: what He stresses is the fact that the general ordering of nature is the work of God.

Thus we see that, for the early Christians, as also for the Jews, God was seen to be at work throughout the whole of nature, sometimes directly but more often indirectly—for nature itself was His handiwork. In some cases (as in the resurrection of our Lord or the giving of the spirit at Pentecost) God's work was so immediate and so obvious that no one could reasonably doubt that direct interventions had taken place. But at other times—who could tell whether events were really miraculous? And, in any case, what did it matter? Enough that God had made the laws of the universe so that everything that happened for the good of His creation was a revelation of His character.

The rigid distinction between the natural and the supernatural is a product of later times—a natural development of the Biblical teaching to be sure, but not there from the beginning. The problem must soon have come to the fore in early Christian ages in connection with the miracles of the saints—for the church came to regard miracles as a prerequisite for canonization and it naturally became important to know whether unusual events in the lives of the saints were genuinely miraculous.

But as in other familiar instances, doctrinal development created serious difficulties. After centuries of argument, when the distinctions had at last been made with infinite subtlety and apparent finality, the development of science created a bewildering mass of new problems. The old astronomy, with its angels pushing the stars through the sky, collapsed like a house of cards. In time even the odour of sanctity—the miraculous sweet smell which exuded from the bodies of many of the mediaeval saints shortly before they entered Paradise—turned out to be nothing other than the production of acetoacetic acid and acetone caused by faulty metabolism in the diabetic. Even the bleeding host, that most awful of miracles in which the transformed element of sacramental bread revealed the sufferings of our Lord, turned out to be nothing more startling than the invasion of a bacillus. These and many similar instances showed how tragically the church had failed to draw the correct dis-

tinctions. No wonder that the growth of science seemed to place the Christian faith in a ridiculous light and to furnish the religious antagonist with the most effective weapon he had ever possessed.

The claims of rationalistic science against religion are thus seen to have been the result of an attempt on the part of the church to be wise above that which was written. Had Christians resolutely refused to pretend that they knew enough about nature to be able to distinguish between the natural and the supernatural, difficulties would never have been encountered. The Christian would have thanked God for every manifestation of His goodness: he would have spoken naturally of God who made the lilies of the field, the stars, the lightnings, the mountains, the rivers, the sunsets, the mineral veins and the works of good men. But he would never have pretended to know whether these works of God had come directly from His hand, or whether they might not have been innumerable stages between God the First Cause and the effects which give joy and gladness to the hearts of men. As a result he would have welcomed every reverent attempt to understand the means God has employed to produce the wonderful things that we see around us, and all arguments of the type "Natural law can explain this or that, so God is an unnecessary hypothesis" would have seemed stupidly irrelevant.

Thus, if the Christian Church could have been saved from the purely verbal wisdom of the middle ages with its almost unlimited intellectual conceit inherited from the ancients, no warfare between science and religion would ever have come about. Even the suggestion of the possibility of such a warfare would have appeared fantastically impossible. How irrelevant it might have been may be illustrated by means of a simple analogy. Suppose a girl receives a present through the post from her lover, what would she think of a sceptically minded person who told her that since she had only received the present from the postman she should cease to attribute it to the original sender? Would she not at once reply: "What does it matter whether he gave it to me himself or whether he used collectors, sorting officers, the railways and finally a postman to send it to me? His motives are the same in either case." In the same way science studies the means whereby God fulfils His purposes and no amount of study of the means can ever explain away the purposes themselves.

The Christian must insist, therefore, upon his right to interpret nature in the light of the revelation of God given by Jesus Christ. He must be completely free, even as Jesus was, to see the workings of God in any direction in which the teleological evidence indicates that He has been at work. There must be no question whatever of invoking God as an explanatory principle only when science fails to produce an explanation : the Christian outlook can recognise no limitations in relation to science. Only when our minds are free to see the working of God in any and every direction in which He may have been at work, shall our hearts overflow with thankfulness for the beauty of the world in which He has placed us for His glory.

This is the true Christian attitude towards the matter we have been discussing. When once it has been wholeheartedly adopted, it creates its own safeguard against narrowness and prejudice. For the Christian will realise that science also has an unlimited right to pursue her investigations of the immediate causes of things and he will rejoice in every fresh discovery she makes—unless it be a discovery for evil.

The Christian who returns to the early Hebrew-Christian tradition of thought will never forget, moreover, that when, in Holy Writ, we are told that certain things were done by God we are not told whether God saw fit to use natural means for accomplishing His purposes. So if it should turn out that some of the things which are generally thought to involve God's immediate creative power could, in fact, have come about by natural means, he will accept the discovery joyfully. In some cases this has already occurred—there is no reason to think that God performed a *special* miracle when He set His bow in the cloud as a token of His covenant that he would not again destroy the earth with water. But the Christian—and let us hope not the Christian alone—will rightly complain if, on the one hand scientific explanations are misused to eliminate God from His creation or if, on the other hand they turn out to be mere verbal subtleties which are neither scientific nor explanatory.

In addition to the danger of misusing religion in order to oppose science, there is also another danger. In science we sometimes find that a principle, sound as far as it goes, is misapplied to realms of knowledge for which it was never intended with results that are often harmful and ludicrous. Those who would see the working of God in nature are faced with an exactly parallel danger. Clearly we must not feel it incumbent upon

ourselves to suppose that *everything* in nature is to be explained in terms of the plans of God. Indeed, this will clearly not be the case. In achieving one plan, a score of unintended results may also follow of necessity. If we suppose, for example, that God deliberately made the world beautiful, then the beauty perhaps, of submicroscopic forms of life, which is unlikely to make man happy, may also have followed from necessity. Clearly every point must be considered on its own merits and we must be careful never to force facts into grooves into which they do not naturally fit. As an example of the type of detailed explanation of Providence of which we must ever beware, we may cite the mediaeval theory that God made the bed-bugs to wake us up in the morning and thus to save us from laziness!

While we must always be humble in our supposed understanding of the *details* of Providence, this does not mean that the religious interpretation can itself be thrown overboard on account of a few facts which do not fit readily within the general scheme. When we find that science fails to explain a phenomenon we do not abandon science. No more should we abandon our Lord's interpretation, because, on rare occasions, we do not understand how it can be applied to a particular problem. Rather must we continue to look for light and remember that the mass of evidence in support of a Divine plan in nature cannot be set aside because *we* are too dull-witted to see our way through certain difficulties.

Finally, just as the scientific approach fills our minds with humility when we contemplate how little we know, so the religious approach will produce the same effect. God's ways are greater than our ways and His thoughts than our thoughts, nor can we ever hope to do more than scratch the surface of the vast oceans of unknown truth that lie around us.

Discussion.

The Chairman said: Dr. Clark has performed a very useful service in defining the methods and the scope of science. Much of the conflict between science and religion has arisen from confusion on the subject of what is science and what is religion. It is therefore of the utmost importance that we should have a clearer idea of their respective provinces. In former days it was the church that stepped out of its province and dictated to men what they should believe

about the physical world around them. In these days it is often the scientists who repeat this error. The mistake is made not so much by the great scientists as by those of lesser calibre. Because science now speaks with great authority many people are misled by these irresponsible statements. Science has such great achievements to her credit that uncritical people have implicit faith in her pronouncements. It is therefore of the utmost importance that everybody should have a clearer idea of the *modus operandi* and the limitations of the scientist. Some people have made the definition of science so wide that they consider it to be tantamount to organised knowledge. If this were true, then, everything would come within the scope of the scientist, including what was once called the Queen of the Sciences, theology. As Dr. Clark has said : " It is not science itself but the fantastic and ill-thought-out claims that are often made in its name that merit opposition from all reasonable men."

I regard it as being the function of a Chairman to encourage discussion and I now leave it to others to speak on this important subject, " The Spheres of Revelation and Science." I am glad to see that there are many young people present and I would particularly invite them to give us their views.

Mr. CHARLES H. WELCH said : In the paper submitted by Dr. Clark is the statement : " If all the facts were known, no disagreement between science and religion would ultimately remain."

It should be held before the mind constantly that " Truth " is " Relationship," and when all relationships are known, all truth will be known also. If I say " No. 12, Queen Anne's Gate " I make a statement, but I can scarcely say that I have uttered a " truth." Such a statement cannot be approved or refuted, it neither affirms nor denies, and it is impossible to act upon it. If, however, I say " No. 12, Queen Anne's Gate is the address of the Victoria Institute," I utter a " truth," because I have discovered and affirmed a relationship.

The paper submitted by Dr. Clark while insisting on the separate spheres of Revelation and Science, very wisely urges all, whether Scientists or Theologians to remember that their discoveries, until related, will not lead them to the goal unto which each in his separate way hopes to attain.

WRITTEN COMMUNICATION.

Mr. W. F. SPANNER, wrote: When Dr. Clark states that the "church" has always stood for a policy of secrecy, I presume he means the Roman Catholic church. His statement is not wholly true of the Protestant Reformed churches which have insisted generally on freedom for learned men to investigate the truth, and have also been prepared to tolerate unlearned speculations by men who desired to air their own opinions. Such investigations hold out the possibility of enlarging the church's understanding of the sacred scriptures; but whilst this is true the churches loyal to the Reformed tradition have never allowed the special revelation given in the Holy Scriptures to be wrenched from their grasp. Care has also to be taken in exercising discrimination between what is genuine learning based on concrete evidence and what is merely fanciful speculation. I think the value of this paper would have been increased had Dr. Clark distinguished between the attitude of different branches of the church (*i.e.*, Roman Catholic, Lutheran, Reformed, and Anabaptist) to the question of freedom for science and speculation. Perhaps he will deal with this point in his reply.

It seems to me that whilst this paper has many excellences and Dr. Clark has placed us under a debt it does not quite succeed in giving a clear view of what it sets out to do, namely, define the limits between revelation and science. I think more attention is required to defining our terms. I take it that science is simply "classified knowledge," or "systematised knowledge"; and it has to be carefully distinguished from what is merely speculation. I think that theology is still rightly to be regarded as the "Queen of the sciences" becauses it deals with the systematisation of the highest knowledge of which man is capable, namely, the knowledge of God. Such theology falls naturally into two departments; natural theology which deals with the general revelation God has given to us through the ordinary course of nature, and special theology which deals with the special revelation of Himself which God has given in the Holy Scriptures, which revelation was added because of sin. Again, true theology must be distinguished from mere philosophical speculation dressed up as theology.

Revelation, I take it, is God's revealing of Himself to mankind and consists of general revelation given through the ordinary course

of nature, and special revelation given through the medium of the Holy Scriptures. The voice of conscience and the sense of the beauties and the joys of life (What man is there anywhere who does not count life to be valuable? This being so all men are under a self-confessed obligation to give thanks to God) are part of general revelation and if man were untainted by sin would be sufficient to give a complete knowledge of God as his Lord and Creator. The Holy Scriptures were necessarily added because of sin and to reveal God as Redeemer.

Agnostic scientists may benefit us greatly insofar as their efforts are genuinely devoted to an appraisal of the true facts of nature, but we may be seriously led astray if we do not take care to separate the facts from the fancies. We live in days when there is a strong tendency to endeavour to force facts to fit into preconceived fanciful theories in the interests of the prevailing Modernist philosophy which has as its root principle the glorification of man in place of the glory of God.

I have poorly expressed what I wanted to say, but trust it may assist towards a better harmonising of modern knowledge with faith.

To sum up on the basis of the foregoing remarks, I suggest that true science (carefully checked by close attention to the facts, and sifted from fanciful speculation) is best considered as the intellectual aspect of revelation. All of us according to the measure of the understanding which God has given unto us may behold something of the glory of God in the intellectual mirror called science.

871ST ORDINARY GENERAL MEETING

HELD AT 12, QUEEN ANNE'S GATE, WESTMINSTER, S.W.1, ON MONDAY 14TH APRIL, 1947.

THE REV. C. T. COOK IN THE CHAIR.

THE NATURE OF CHRIST'S AUTHORITY.

THE REVEREND PRINCIPAL P. W. EVANS, D.D.

WHILST our main concern is with authority, as possessed and exercised by Christ, rather than with general problems, it is not unnecessary to recall that religion is, by its very nature, authoritarian, and, in so far as it loses that characteristic, it deviates from its true idea. However variously we define religion, we must include in it the notion of relationship to a higher power or powers, by whose superiority we are controlled. When Julian Huxley (in *Religion without Revelation*) defines religion as "a way of life," and explains that "religion arose as a feeling of the sacred," he reduces religion to an activity instrumental to our purposes and arising out of our nature. It is not surprising that he acknowledges that it will be extremely difficult to induce humanity to abandon thinking "in terms of an external, personal, supernatural, spiritual being," and instead to "see God as a creation of the human soul (albeit a necessary and fruitful one)." The desired change will, he thinks, only mean that "the living reality will have to change its clothes—that is all." But the new garments clothe a form that is certainly not religion, and which has never lived. The novelist sees more clearly than the scientist when J. B. Priestley makes one of his characters say: "You can't invent a god; he must arrive like a thunderbolt" (*Faraway*, p. 432). The speaker adds, "I don't think he will arrive"; the Christian knows One Who has arrived, and Whose name is Immanuel, God with us.

II

The reaction against the idea of religious authority is understandable. The word is prejudiced by excesses of authority in many realms. Papalism led to the word being covered with justified odium. The totalitarian systems of government gave us modern Cæsarism. Novelists and playwrights, by a one-sided presentation of Victorian home life, fostered the idea that the nineteenth-century child lived in harsh and arbitrary subjection, with the result that to-day innumerable homes are destroyed and a worse serfdom inflicted upon youth by reason of the decay of parental authority. Into a world thus inclined to revolt against control there has come scientific dogmatism, and the rebels who rejected other forms of authority are found eagerly embracing the new imperialism.

To this reaction, however, there is a better side, in the recognition of the fact that, since without freedom personality is not expressed, an authority that annihilates freedom must be withstood. The Viennese psychology laid its emphasis on self-expression, leaving us with the problem of alternating rival selves; which has the right to be expressed. The expression of the self should involve the development of the self, and that self is inevitably social, and must have regard for others in its expression. The rise of dictatorships was perhaps not wholly unrelated to the prevalence of such unbalanced views. It is, at any rate, significant that these political dictatorships have all flourished on soil previously occupied by Churches of the strongly authoritarian type, who furthered their misconceived authority by seeking alliance with temporal power. There is a warning there against the misuse of an authority claimed in the name of Christ.

In the light of these teachings we echo Wordsworth's complaint:—

> "Me this uncharted freedom tires;
> I feel the weight of chance desires."

A freedom which knows nothing of authority degenerates into subjection to the arbitrary tyranny of "chance desires." Freedom and authority must be reconciled, for one thing, because the individual stands in, and over against, a world that can control him and that he can control. Neither individual nor world has unlimited freedom or authority in relation to the other. This world contains other persons and things. In

relation to the world of things, we have no authority to stop the flow of volcanic lava, but we have freedom to get out of the way. We cannot command the seasons, but we can regulate agriculture so as to gain advantage from them. As Francis Bacon put it, we can rule Nature by obeying her. In regard to the world of persons, this interdependence is yet more marked. We were born of other persons, our parents. To them we owe nurture, training, protection in infancy. In maturity we assert our freedom from such control, but the coming of age and infirmity will redress the balance. In religion, obviously, Freedom and Authority must be reconciled. Christianity comes to us at first *via* Authority (tradition and teaching, example and precept), but it is only received by a free act of personal devotion. Godet dedicated his New Testament Introduction to his revered master, Neander, "who opened up my way between slavery to the letter and a proud disdain of authority."

Thomas Carlyle has emphases which need correction today, but his strong sense of life, finding its freedom under rightful sovereignty, is justified. "Liberty?" (he cries): "the true liberty of a man, you would say, consisted in his finding out, or being forced to find out, the right path, and to walk therein" .... Oliver Cromwell is "no volunteer in public life, but plainly a balloted soldier strictly ordered" into public life. "Find your king; raise him to the supreme place and loyally reverence him—and you have a perfect government" (*Past and Present*).

III

The Basis of Christ's Authority.

"Find your King!" Not *appoint* your King!

The inherent nature of religious Authority needs to be remembered in view of suggestions which make Christ's authority dependent on qualities in His character that instantly win the allegiance of men. There is truth in this, if we avoid the error of making the authority dependent on our recognition of it. That would mean that it is constituted by our appreciation of its right to command us; that way of thinking is natural to a society which is familiar with elected rulerships, whose authority arises out of the electorate, but valuable as such elements are within society, they are irrelevant to the life of religion. The worshipper does not adore a republican presidency, but Him Who is before all things and in Whom all things consist. Christ's

kingly authority derives from His own Person, not from any acknowledgment of ours.

We prefer not to speak of "The Authority of Jesus" for two reasons; one is that the earthly name, the name of the Incarnation period, insufficiently expresses the transcendent and eternal quality of His rule over His people; the other is that the name "Christ" speaks of a divine anointing, and thus of a divinely-given authority. The supreme authority in religion must be God Himself, but the New Testament reveals Christ as One Whom all men are to honour "even as they honour the Father." The titles therefore that indicate His relationship with God express the basis of His divine authority. His authority, because it is His, can have in it nothing that is unjust, barrenly coercive or tyrannous; instead, it is a gracious and kindly ministry. G. K. Chesterton said. "Catholic doctrine and discipline may be *walls*, but they are *the walls of a playground*" (*Orthodoxy*, p. 267). We prefer a variation of the metaphor that would describe the discipline of Christ as the walls of a *home*. Does His authority irk us sometimes, so that (in the words of Psalm ii, 3), we would "snap their ties and fling off their control"? We should remember then that these ties have their protective and alluring value; we have been "drawn with the cords of a man, with the bands of love" (Hosea xi, 4). Another word from Hosea (x, 2) may be cited with relevance: "They may say . . . But have we not a king? Ah, if men have no reverence for the Eternal, what is the good of a king?" (*Moffatt*).

IV

Forms of Authority.

Authority has various forms in society, and is not always enshrined in exact written form, *e.g.*, the authority of our parliamentary system or of the British Constitution. In these cases the authority is really resident in, or at least exercised by, the men who work them, so that ultimately authority inheres in people, not in abstractions. Roughly we may classify the forms of authority in two ways: (*a*) that derived from the possession of power, and (*b*) that flowing from personal qualities. (*a*) "If we ask any jurist or student of political philosophy, what is the ultimate basis of authority in the State, he will tell us, it is the power of life and death. . . . Unless the chief of

the State could, at the demand of public justice, cut off a man's head, it could not be a guardian of right. Not in vain does the magistrate bear the sword " (A. M. Fairbairn, *Studies in Religion and Philosophy*, p. 414). Actions can be controlled by one who has power to inflict penalty. Such is the relation of king and subjects, of master and slave, of tyrant and victim. Since authority of this type depends upon power, the greatest authority will be the One Who wields supreme power, God, the omnipotent Creator and Ruler, source of all might. To every ruler we may say, in our Lord's words, " Thou couldest have no power over me except it were given thee from above " (John xix, 11). When, therefore, we acknowledge the Deity of our Lord, we in this sense ascribe to Him supreme authority. Such authority may sometimes seem harsh in its exercise ; it can compel obedience, but what of the consent of our will and the response of our love ?

(*b*) As the nobler type of authority we turn to that which is based on personality, which achieves its aim, not by the force wielded, but by the love and admiration evoked. Parental authority succeeds, not by its power to punish, but by its will to sacrifice, and to win a love that answers its own. Besides this spiritual authority of the parent, there is the intellectual authority of the teacher, which does not merely impart knowledge but also quickens mental activity. Then there is moral authority, the authority of character, the ideal of manhood. All these are combined in the authority of Christ. The trouble with our world is that the authority of power, and that of personality, are often in conflict, as when Herod could execute John the Baptist, and our Lord Himself holding a reed-sceptre was condemned by Pilate. He then had the authority of personality but, for His redemptive purpose, laid aside the authority of power. We shall one day see Him in possession of both kinds of authority (as in Rev. xix, 11–16, where power is indicated by the many diadems, the following armies, the sword and the rod of iron, while the grace of His sovereign personality is shown by the title " faithful and true.") The hope of our race is in His coming to His kingdom and ruling it as Almighty yet All-loving, All-wise and All-holy.

V

Authority in New Testament and in History.

The New Testament ascribes to Christ Jesus the authority of power, evidenced in His miracles of healing, of control over.

nature, over the menace of death. Moreover, He exercises authority as Judge (Matt. xxv, 31 *et seq.*; John v, 22–28). He claims it as Revealer of God, as Teacher with exclusive knowledge, and therefore with incomparable authority (Matt. xi, 22, cf. Luke x, 22). It is implied in His claim to forgive sins, for He confers pardon, not merely announces it. Pardon, to be complete, must be combined with full knowledge and come from the fountain of ultimate justice, and that ultimate justice is the ultimate authority. Authority is also involved in His uncompromising claim to lordship. He requires swift, unquestioning and unreserved obedience (Matt. x, 37; xxviii, 18–20; Luke xiv, 27). The first disciples did not find it strange to read that a woman who had known Him in infancy, in obscurity, in poverty, should say to others: "Whatsoever He saith unto you, do it!" Besides the wonder of Mary's own words, we ought to consider the marvel of their unhesitating acceptance by the early Church, when living memory could yet check the tradition, and would undoubtedly have disowned it, had it been out of keeping with their recollection of His claims, and their own admission of them.

This authority is continuous, and instead of ending with the Ascension it thereupon becomes more comprehensive and more explicit. The Epistles, it has often been noted, have very little quotation of sayings of Jesus, but they are saturated with His Spirit, and they concede to Him the place of highest authority. The fact that they are not careful about His *ipsissima verba* shows that they realised His authority in no rigid fashion. He rules them, not by a codification of His utterances, but by His vivification of their lives. His is a living authority, to which men, both in the New Testament age and ever since, submit themselves, and in that submission find freedom and self-fulfilment. The results of obedience to it have always been such as vindicate its essential rightness. History has instances of tragedy arising from a misunderstanding of His authority, or rejection of it, but, where action is taken at His command, the issue continually shows that they who follow Him do not walk in darkness. "Authority forgets a dying King," and all other kings pass away; their authority was once a power, then it is but a name, and finally becomes merely a fading memory. Nor is the authority external, for it is that of the indwelling Lord, and it is not alien, for it sways those who are made in the Divine image and have been re-created in Christ.

We notice the important fact that our Lord's authority, during the days of His flesh, was not merely legal and detailed, but consisted of principles rather than of their applications. This was in striking contrast with life under the Jewish law, with its concern about minutiæ (cf. Schürer, *History of the Jewish People*, II, ii, 90–125).

VI

Media of Authority.

How is Christ's authority mediated for us today? By the Bible, the Church, or Christian experience? The Protestant, the Catholic and the Mystic thus variously answer, but in practical experience the three media usually form a threefold cord not quickly broken. When their deliverances conflict, however, we should certainly give chief and regulative place to the Bible, since the others are channels of a derivative authority in a more remote sense than is true of it. Obviously, neither individual spiritual experience, nor the collective experience of the Church (using that term in its most comprehensive sense), can inform us of matters concerning the beginning and consummation of all things; only through a revelation given to elect souls recorded by them and preserved for future generations, could this knowledge be available for all the subsequent ages. Yet our judgments, of events within history, are affected by what is beyond history. We should assign to the Bible the primary, place, next we should listen to collective Christian experience, and lastly, in submission to these, we should study the "voice within," the "inner light." The guidance of the two latter has often misled, but there is no evidence that the Bible has been a wrecker's light. It is the purest channel of Christ's authority we possess, and has a permanence unaffected by changes of time, fashions of thought, eccentricities of mood, or freaks of temperament.

VII

Limits to His Authority.

What limits can be set to His authority? The real tragedy of our time is the practical rejection of His spiritual and moral authority, yet the ground of actual controversy is found in the question as to His intellectual authority. It must be realised

that the frontiers, between these regions of authority, cannot be drawn by us with absolute certainty, and cases are conceivable where to reject Christ as Teacher for the mind is to disown Him as Lord for our conscience. C. J. Cadoux (*The Historic Mission of Jesus*, pp. 338–345) discusses "the relation between the teaching of Jesus (as reported by the Synoptists) and absolute truth . . . . This teaching contains certain elements which are, to all appearances, incompatible with beliefs which we cannot help regarding—under the guidance of the Divine Spirit—as indubitably true." The difficult questions dealt with are such as the Lord's Return, the attribution of illness and insanity to the malignant work of evil spirits, and the eternity of future punishment. Dr. Cadoux discusses various methods of dealing with these difficulties. One is to ascribe them to inaccurate reporting, but "the evidence that Jesus said these difficult things is exactly the same, in objective strength and inherent credibility, as that on which our whole knowledge of Him (and therefore also our belief in His Divinity) rests." Or we may hold that in such teaching our Lord was accommodating Himself to His hearers, but that is doubtfully ethical, and "it would mean that He consciously indoctrinated His hearers with a number of very serious beliefs about God which he believed to be false." These eschatological elements may be simply omitted as religiously unimportant—but they hold a central place in Christ's teaching. Or we may appeal to the peculiarly pictorial nature of the Oriental mind and spiritualize the teaching. Clearly, there is justification for this, but to interpret much of His teaching as figurative does not dispose of all the elements found objectionable. Two ways remain, according to Dr. C. J. Cadoux. The one he favours is to assume that Jesus's knowledge was "limited by the conditions of His race and education, that His eschatological teaching contains an element of human ignorance and error." The other is the way to which we believe we are led," reverently to accept the reported teaching of Jesus as a Divine revelation of the actual truth of things." Such an acceptance by no means commits us to abstaining from, or opposing or discouraging the processes of, historical enquiry, textual investigation and exegetical labour, whereby students endeavour to ascertain what was originally said, and intended, by our Lord, for it is part of our obedience to His authority that we spare no pains to find out what His pronouncements actually are and mean. Even such questions as to whether,

and to what extent, human interpretation is mingled with the Gospel tradition in our present documents, are not foreclosed by entire intellectual authority of Christ, though caveats may be entered from other considerations. No charge of obscurantism can validly be made against those who wish to know only and precisely what our Lord really said, and whose motto thereafter is, "whatsoever He saith unto you, believe it." It seems reasonable, not only to enquire, "Lord, what wilt Thou have me to do?" but also, "Lord, what wilt Thou have me to think?"

Dr. Cadoux's own position is one that ascribes to Christ an authority limited by fallibility. We admit the possibility of such an authority, for examples of it are found in the great teachers of the race. Apostolic authority is of this order. Fallibility, however, *prejudices* authority, whereas nescience only *limits* it. We refer to such nescience as our Lord stated concerning Himself in Mark xiii, 32. Here the nescience is clearly recognised and openly acknowledged: whilst therefore it limits His authority to that which He definitely claims to know and to teach, it actually strengthens the authority with which that teaching comes to us. Where the authority is held to be fallible, dubiety enters as to the general statements made by such a one. If Jesus believed that many would be ultimately lost, and would endure eternal punishment, and if this is "incapable of being harmonized with Jesus's picture of God as the *Father* of men or as the Shepherd who goes out in search for a single straying sheep," by what right do we select one of these incompatibilities as acceptable to our faith and reject the other? May not the painter of two incompatible portraits be unreliable in both? May not the fallibility affect the revelation of the Divine Fatherhood as well as that of Gehenna? To reject the teaching we find unwelcome, because it is inconsistent with other teaching we would prefer, is to accept the rule of the arbitrary. Dr. Cadoux realises the problem when he writes: "A revered Christian senior, with whom I was once discussing this question, observed that what we have to do is to judge Christ by Christ" (op. cit. 344). Our first impulse is to ask, "Is Christ divided?" If, however, this canon of judgment only meant that isolated details of our Lord's teaching are to be read in the light of the whole of His person and work, we should regard it as true and valid. Protestant exegesis has generally asserted that particular words of Scripture are to be interpreted by the general consent

of the Word of God; that could not be held, however, to justify the rejection of clearly-attested teaching, which was inharmonious with anyone's own conception, of the Divine Teacher. If the Christ, of our own preference is set as Judge over the Christ depicted in the New Testament, the final authority is clearly our own judgment.

It is objected that the attitude we advocate, of complete acceptance of the ascertained teaching of our Lord, whatever the consequences, means either that we "force the plain meaning of the supposed revelation, so as to cause the incompatibility to disappear," or shut our eyes to the incompatibility, or "dismiss certain indubitable facts or firm convictions of our own as erroneous because incompatible with Divine revelation." The two former methods we would certainly regard as wrong, but the third course of action seems to us the right one to take—with the qualification that the facts which clash with the revelation are, precisely on that account, not "indubitable." Further, account must be taken of the fact that, in other realms of knowledge, there are instances where apparently irreconcilable facts have to be tenaciously held, awaiting the synthesis which further information, and developments, may bring. Moreover, the matters, concerning which the chief difficulty is felt to arise, are matters about which only a Divine Revelation can give us knowledge, and to reject that because of "firm convictions of our own" appears unwise.

This, of course, is an appeal to faith, but as A. M. Fairbairn said, "Christ's authority lives to faith and does not rest on force." That means that His authority becomes inward, without becoming merely subjective. Our freedom has its proper exercise, yet we are delivered from any purely subjective judgment of Christianity; the latter is impracticable because (*a*) It has no constancy, but varies with varying moods and changing personalities; (*b*) it cannot be proclaimed with certainty to others, and having no authoritative commission cannot be missionary; and (*c*) it has no adequate sense of the Church universal. Dr. Denney wrote: "It is through experiences in which we become debtors to Jesus for meat and drink, for light and life, that we become conscious of what His Authority means." For the needs of body and soul, life and death, time and eternity, we are dependent on Him, and the realisation of our unlimited dependence makes us eager to acknowledge His unbounded authority.

Discussion.

The Rev. Chas. T. Cook said: Dr. Evans has made us his debtors for a singularly illuminating paper. There is no religious question more fundamental than the nature of Christ's authority, for our convictions in regard to it will determine our attitude to every vital problem in the Bible, and to every article of faith. The exposition of the theme presented to us this afternoon is the Evangelical reply to the extreme subjectivism of writers such as James Martineau in his *The Seat of Authority in Religion*, and Auguste Sabatier in his *Religions of Authority and the Religion of the Spirit*.

The unique authority of our Lord seems to have been one of the things that most astonished the multitudes. "When Jesus ended these words [in the Sermon on the Mount], the multitudes were astonished at His teaching: for He taught them as one having authority, and not as the scribes" (Matt. vii, 28). The scribes declared nothing on their own responsibility; they appealed always to tradition. As Dr. Denney says, "The message they delivered was not self-authenticating . . . . [Christ] spoke the final truth; He laid down an ultimate law."

On the subject of the Media of Authority (section VI), I am wondering how Dr. Evans would relate the ministry of the Holy Spirit to the "threefold cord"—the Bible, the Church and Christian experience. No doubt he equates the Holy Spirit in part with "the voice within" and the "inner light," yet it is quite certain that he makes some distinction, for he speaks of the danger of the inner voice misleading men.

In particular, I would like to thank Dr. Evans for dealing so cogently with the views of Dr. Cadoux who not only attributes ignorance to our Lord in many of His pronouncements, but error. Unfortunately, that point of view is widespread. It seems at times to make little distinction between the development of our Lord's consciousness and that of an ordinary sinful man. Indeed, if Christ was subject to illusion and errors of judgment, it is difficult to hold fast to His moral and spiritual perfection. The Apostle Paul, as Saul of Tarsus, is an outstanding example of how wrong thinking on matters religious leads directly to wrong actions.

In regard to the so-called Kenosis, the very form of the Pauline declaration, in Phil. ii, 7, is at least an implied rejection of many of the inferences from the words "He emptied Himself." Here we have no ordinary human limitation imposed by heredity and environment, but something vastly different—a voluntary "*self*-limitation." Only a pre-existent divine Being could "empty Himself" in the manner indicated in this passage, and I submit that the aphorism, "To err is human," has no relevance to One who was distinguished from other men not only by His sinlessness, but by the fact that His subliminal consciousness was that of Godhead. Moreover, as Dr. Evans points out, Christ's statement that He did not know the day or hour of His return "actually strengthens the authority with which His teaching comes to us." When a man tells us plainly of the limits of his knowledge, we can have confidence that he is making no affirmations unless he can speak with certainty.

Air Commodore WISEMAN said: Dr. Evans' very able paper is welcome because in a most realistic way it faces up to the ethical issues involved in the authoritative claims made by Christ. I submit that those claims were absolute; to sinlessness, to be the Truth, to be the Founder, Legislator and Judge in the Kingdom of God, to Deity. For a century it has been the fashion in some quarters to evade the issue by the introduction of the "Kenosis" and "Accommodation" theories. Many have wondered how long theologians could continue to hold these theories and at the same time accept Christ's statements about Himself. The effect of the first of these theories is to deny His knowledge, and of the second His truthfulness. Both deprive Him of His reliability and consequently His authority. In the minds of many the first implies a self-limitation of His knowledge, which made Him in many respects dependent upon "current Jewish notions" for His information; while the second theory implies that although He did know He accommodated Himself to the errors current around Him. It is sufficient to say that He spent His public Ministry cutting clean across the prevailing errors of His time. The accommodation theory implies that Christ knew the facts but accommodated His speech so as to bring them into accord with current errors. I am growingly astounded at the implications of this theory, especially as the men

who hold it are the men who say that when preaching or writing about a biblical subject they cannot feel absolutely honest unless they indicate that they have no belief in certain ideas promulgated by our Lord. This surely means that they themselves feel that they must maintain a higher degree of honesty than they attribute to our Lord.

Dr. Evans points out that Dr. C. J. Cadoux has abandoned the accommodation theory because it "is doubtfully ethical, and it would mean that He consciously indoctrinated His hearers with a number of very serious beliefs about God which He believed to be false."

In the end I believe that the other theory, the Kenosis, must also logically be given up and I think Dr. C. J. Cadoux has done this. In his *Pilgrim's Further Progress*, while writing of "the Lordship of Jesus," of "His unique goodness and power," and of His miracles, he refers to the "modern scholarly theologians" who retain the credal definition of Christ's Divinity "either by tacitly evading the whole difficulty, or by some form of the theory of Kenosis," which he defines as "a comparatively modern device, framed by non-Romanist theologians on the basis of Philippians, ii, 7," and he adds, "it is extremely doubtful whether a true exegesis of Philippians, ii, 7, furnishes any support for it; and there is certainly no other Scriptural or indeed any early non-Scriptural passage to warrant it." But Dr. Cadoux has not only rejected the Kenosis theory but the New Testament doctrine of Christ for he refrains from "the ascription of absolute Deity to Him," and his ideas about Christ do not differ from some forms of Unitarianism.

Thus, those who refuse to acknowledge our Lord's claims about Himself are in a dilemma, those who accept them have no need of the theories which rid Him of His authority.

Written Communication.

Rev. W. E. Dalling wrote: Many, doubtless, will express their thanks to Dr. Evans for this paper, but I would like to add mine for this real contribution to this most important subject.

May I submit the following remarks, in the hope that they may help towards the synthesis that is desired?

These comments refer to the apparent difficulty of harmonizing

Christ's teaching of eternal punishment with His teaching " of God as the Father of men . . .", and have two main points :—

(1) *That God's Fatherhood is essentially different from Human Fatherhood.*

As we are compelled to describe divine things by human terms, it is well to remember that " Fatherhood " is but a term of accommodation.

Because we cannot imagine a human father consigning his offspring to eternal punishment, we argue that eternal punishment cannot be harmonized with God's Fatherhood.

But there is this essential difference.

While human fatherhood implies that a life basically the same in nature is found in parent and offspring, the same is *not* true of God's Fatherhood in relation to humanity ; moreover, Fatherhood is but one of the many relationships existing between God and man.

Whether we consider God's Fatherhood in—

(*a*) Creation : Lk. iii, 38 ; Gen. i, 27 ;

(*b*) Nationalistic Relation to Israel : Deut. xxxii, 6 ; Is. lxiii, 16 ;

(*c*) Regenerative Power : Jn. i, 12 ; 2 Pt. i, 4 ;

we have no authority for claiming that there is a oneness of life between God and the human race, between God and Israel, between God and the regenerate, similar to the oneness of life shared by parent and offspring. Neither Adam, Israel, nor the regenerate, is God with all His essential attributes. The created can never have underived life. Thus, our conception of the Fatherhood of God must be very different from our idea of a human fatherhood.

(2) *That the Fatherhood of God in the Bible is a Concept with a varying content.*

We find three conceptions of God's Fatherhood in Holy Writ, already indicated in our (*a*), (*b*), (*c*) above.

In connection with (*b*) we find

1. That much of our Lord's teaching, *e.g.*, The Prodigal Son, is concerned with God's Nationalistic Fatherhood.
2. That many in Israel, who rejected Christ's teaching were told that the devil was their father.

We suggest that our Lord's teaching on the lost and their eternal punishment is in no conflict with the revelation either of the creative or of the nationalistic Fatherhood of God.

In connection with (*c*), God's Fatherhood by spiritual regeneration, our Lord's teaching is in perfect accord. Sonship through redemption and regeneration is the only state that gives eternal salvation and freedom from divine wrath. In Christ there are no lost. There can be no eternal punishment for those brought into such sonship.

We submit that the authority of Christ's teaching is upheld, for complete harmony is manifest in that :—

(*a*) Christ teaches that only those who receive Him and are regenerated, have the divine nature that is necessary to spiritual sonship.

(*b*) He teaches that the unregenerate only are lost ; not sons by regeneration.

May not these brief comments point toward the synthesis of Christ's teaching that is necessary to an unqualified acceptance of His authority ?

Author's Reply.

In reply to the Rev. Chas. T. Cook's question as to the relation of the Holy Spirit to the Bible, the Church and Christian experience, I think the correct answer would be that these three are media through which He speaks but since each medium has a kind of independent subsistence it is conceivable that the Spirit may be limited by it, as a violinist would be limited were he performing on an indifferent instrument. If the Bible is ill-translated, or its text faultily ascertained or its meaning misunderstood by mistaken exegesis, the voice of the Spirit may not be properly heard. When a Church becomes over-organised, and in the degree to which all Churches are disobedient to the Lord, we find it difficult to " hear what the Spirit saith in the Churches." There are many instances where the clamant voice of a man's inner self has been mistaken for the voice of the Holy Spirit. In practice, though, he who strives to check what he thinks to be the inward prompting of the Spirit

by the concurrent testimony of the Church, and—most of all—by the written word, will find that he has sufficient light and certainty. Of the three strands in the threefold cord, the Bible is least liable to limit the Spirit Who speaks in it.

Air Commodore Wiseman makes an important point when he draws attention to the compulsion which some teachers feel to repudiate explicitly ideas promulgated by our Lord, whilst they yet suggest that He Himself refrained from explicitly rejecting contemporaneous ideas which He cannot possibly have held.

The Rev. W. E. Dalling gives a very helpful classification of the different senses in which the idea of Divine Fatherhood is used in the Scriptures. I should add the common employment of the term " son of . . . . " to indicate moral resemblance. I think however, that the distinction would not fully meet the case of those who regard Eternal Punishment as inconsistent, not only with the Divine Fatherhood, but with the Divine goodness. Put otherwise, they would say that such punishment would be impossible, not only to a father in the case of his son, but also to any good man in relation to anyone under his authority. Mr. Dalling will doubtless agree that the answer is manifold, including the arguments (1) that Fatherhood does not exhaust the relationship of God to man ; (2) that the human metaphor must not be conceived as fully adequate to set forth a divine fact ; (3) that the reluctance we feel to contemplate such a fate for anyone must be infinitely less than that felt by Him Who wept over Jerusalem ; (4) that He therefore would only have said such things if they were indisputable ; (5) that the fate of the lost should be set against the grace they reject ; (6) finally, that on such a theme revelation is our supreme source of information, rather than speculation, and the revelation about eternal punishment is as well warranted in Scripture as the Parable of the Prodigal Son.

872ND ORDINARY GENERAL MEETING

HELD AT 12, QUEEN ANNE'S GATE, WESTMINSTER, S.W.1, ON MONDAY, 28TH APRIL, 1947.

REVD. J. STAFFORD WRIGHT, M.A., IN THE CHAIR.

The following elections were made: Principal Andrew Martin, M.A., Ph.D., D.D., Fellow; Rev. Matthew Francis, M.Th., Fellow; Rev. W. E. Dalling, M.A., Fellow; S. Pattenden, Esq., Member; H. J. Salter, Esq., B.Sc., Member; Daryl Chase, Esq., M.A., Ph.D., Member; P. E. Purkiss, Esq., Associate; James J. Packer, Esq., Associate.

The CHAIRMAN then called upon Mr. P. O. Ruoff (in the absence of Mr. Leslie through illness) to read the paper.

PSYCHICAL RESEARCH IN THE LIGHT OF SOME RECENT DEVELOPMENTS.

By W. E. LESLIE, ESQ.

MEN feel an urge to systematize their experiences, to arrange them in some sort of order or pattern. The various special sciences are the patterns in which different sets of experiences have been arranged. Philosophy takes these sets of patterns and seeks to arrange them in one comprehensive pattern. Experiences which refuse to be fitted into any scheme produce a feeling of discomfort which may range from mild uneasiness to fear, or even horror.

Psychical Research seeks to investigate some of these intractable experiences. It asks whether certain alleged events actually happened, what was their real nature, and whether and how they can be correlated with other similar facts and with the general order of nature. Perhaps at this point I should give a description of these phenomena, but it is very difficult to define them. Their nature will emerge as we progress.

If research is to be more than haphazard it should follow some sort of ordered method, which, however, must be flexible, lest we fall into the error of shaping our material to suit our method. Perhaps it would be safest to start from the known and feel our way gradually into the strange and unknown.

It is also wise to keep in mind the possibility that apparently diverse phenomena may, in reality, be varying manifestations of some common principle.

Let us start with a very well known phenomenon—sleep. We are all quite familiar with it, and yet when we come to examine it closely we soon find that there is much that we do not know about it. Even from the physiological standpoint there is not yet agreement as to its nature. The sleeper seems to be unconscious, yet he dreams. A mother will sleep undisturbed by many sounds, yet a faint cry from her child will wake her. A soldier may lie down near his gun and sleep in spite of its firing, yet he may be roused by the sound of an approaching shell. Some, usually children, will get up, walk about, and perform purposive actions while asleep. There are cases in which problems which have baffled the student in the evening have presented themselves ready solved in the morning, as though some part of him had worked on them during the night. Sometimes this process has presented itself to the sleeper in dramatic form. Professor Hilprecht had been working on a collection of seals, and was puzzled by an incomplete specimen. During the night he dreamed that a priest came to him and told him that he (the priest) had been commissioned to engrave a seal, for which purpose he had had to make use of part of another seal. In the morning the professor, following this hint, found the missing part, and his problem was solved. An account of the incident will be found in the Proceedings of the Society for Psychical Research Vol. XII. Apparently the Professor had noticed the peculiarities of the seal subconsciously, and this reached his dream consciousness during the night.

This case is of special interest, for it suggests that there is in man a dramatizing activity which may be responsible for dream activity and for the form in which telepathic impressions sometimes emerge in consciousness. At times these are externalised as hallucinations or apparitions. There may also be a link with the mechanism of mediumistic "controls" and "communicators."

We have seen that in sleep "part" of the personality may be inactive, while other "parts" are alert. In this it resembles the hypnotic state from which it is sometimes indistinguishable. The state is often induced by the suggestion that the subject is falling asleep, and it may vary from a slight drowsiness with increased suggestibility to profound unconsciousness. So with sleep.

There are peculiarities of the waking state which seem to be due to a splitting of the ordinary personality into "parts." When we learn to play the piano every movement has to be consciously controlled. Afterwards most of these movements seem to take place automatically. There is an organized hierarchy of nerves and muscles functioning as a "part" of the self. This seems to happen in absentmindedness. Perhaps we set out to go to one place, and find that our feet have carried us to another. If our attention is highly concentrated on, for example, a book, other people may speak to us without attracting our attention. This can be carried further. If attention is highly concentrated it is possible to get into touch with the other "part" of the person—one might almost say the rest of the person, and get it to do simple actions without the knowledge of the "part" that is concentrated. It is easy to think of simple habitual movements in terms of muscular and nervous habit patterns: but something more is needed to explain these latter cases.

From "absent mindedness" to loss of memory is a short step. The condition is fairly common. Sometimes it lasts for a long time so that the patient may build up a new life in a strange place. Sometimes the new life alternates with the old. This sort of thing has been popularized by the story of Dr. Jekyll and Mr. Hyde. Such cases are so similar to those of multiple personality that it is difficult to draw the line between them. A condensed summary of the cases mentioned in McDougall's *Outline of Abnormal Psychology* (pp. 482–586) follows for the benefit of any who may not be familiar with the subject.

> *Mary Reynolds* wakened one morning in the condition of a newborn infant except that she could say a few words. She learned very rapidly. After five weeks she woke in her normal state knowing nothing of what had passed in the interval. She alternated between these states for many years.
>
> *Rev. Thos Hanna* had a bad fall. He also was found to be in an infantile condition on recovering consciousness. He also learned quickly. He began to dream of old friends unknown to him in his new life. Then for a week he would wake alternately as his old self and his new self. Then for a time he was conscious of both personalities until he was eventually cured.

Léonie was dull, melancholy, timid. Under hypnosis she became gay, lively, noisy, and called herself Léontine. Under deeper hypnosis there appeared Léonore, a serious and capable person who looked down on both Léonie and Léontine.

Félida X began to show hysterical symptoms at 13. After a short sleep she would waken quite healthy, but another sleep left her in the hysterical phase. The alternations lasted some years.

Marcelline's case was similar but her healthy phase had to be restored by hypnosis after each "relapse."

The B C A Case. This woman's symptoms began with her marriage. Her husband's sickness and death caused more strains, as did a severe emotional shock some years later. She developed three "personalities" called B. C. and A respectively. She was eventually cured, but B could be recalled under hypnosis.

Maria. Her troubles started with the tragic death of her father. She had premonitory symptoms for six years, and for the next two years two personalities controlled her body.

The Beauchamp Case. The original report on this case runs to nearly 600 pages and discloses the complicated relationships between three personalities B1, B3 (also called Salley) and B4.

The Doris Fischer Case fills three large volumes by Dr. W. F. Prince, but is outlined by Dr. T. Weir Mitchell in his *Medical Psychology and Psychical Research.* Here we have four personalities—Sick Doris, Real Doris, Margaret, and Sleeping Margaret. This last personality only manifests herself by speech during sleep. Sick Doris started with infantile knowledge like Mary Reynolds and the Rev. Hanna.

McDougall considered that these cases came under the heading of Abnormal Psychology. This does not mean that every detail can be given a psychological explanation: but that they do not give the impression that they cannot be related to the general body of psychological phenomena.

We must now return to the actions performed when the attention is concentrated elsewhere. Actions performed without the direction of the conscious will are called "automatisms." Some of them are quite familiar in "willing" games. An object is hidden in the room while one of the players is outside. He is then called back and asked to find it. Usually the hand of another player who knows where the object is is placed lightly on the searcher's head. He frequently finds the object without knowing how he has done so. No doubt many unconscious indications are given by other people in the room, but the chief factor is unconscious muscular guidance by the person whose hand rests on the searcher's head. In another game a watch is held by its chain by a lady and gentleman. It begins to swing in a way that is supposed to be connected with the sex of the players. They are both honestly convinced that they have not swung the watch, but that is what has happened. In yet another game a small pellet on the end of a thread is held inside a tumbler. It will swing and tap out messages. In another arrangement the pendulum is held in the middle of the letters of the alphabet arranged in a circle. It will then spell out words and phrases by swinging from letter to letter. The use of the Planchette is another example of unconscious muscular activity, as is also the motion of the diviner's rod. In all these cases the agent asserts most stoutly, and with perfect honesty that he has not attempted any movement. But if some step be taken to ensure that he cannot make any movement, nothing happens.

From planchette it is but a step to automatic script. The subject sits with pencil and paper, the attention is suitably distracted, and the hand scribbles or writes. Sometimes the involuntary movements are of the organs of speech—the person utters vague jumbled sounds or words, and sometimes complete phrases or connected discourses.

It often happens that what is spelled out, written, or spoken, purports to come from some outside source, usually a deceased person. At present, however, we have only been considering the nature of the automatic mechanism. Before considering the alleged communications from non-incarnate persons we must look at Telepathy and Clairvoyance.

Telepathy is the passage of ideas or emotions from one mind to another without the use of the senses. Clairvoyance is the ability to become aware of non mental phenomena without the

use of the senses. In a recent article Dr. J. B. Rhine has contended that most, if not all, the evidence for Telepathy may be due to Clairvoyance. (Journal of Parapsychology for September, 1944). Of course the alleged perception of non mental phenomena at once raises the philosophical problem as to whether such phenomena exist. Here are two simple illustrations of the sort of problem involved. Suppose a red ball is put in a box to make sure that a clairvoyant could not see it by ordinary vision. If she claims to "see" a red ball she is seeing something that does not exist, for the ball is not red in the dark. Or take an organ pipe tuned to "C" but not sounded. If the clairvoyant in another room claimed to "hear" the note "C" she would be hearing something that did not exist. Against this it might be said she was perceiving the colour or the sound precognitively or retrocognitively. As all experiments involving either Telepathy or Clairvoyance have been affected by the establishment of Precognition on a scientific basis we must see how this has been done. For a long time precognitive dreams have been recorded, but it is only quite recently that facts that can be submitted to mathematical analysis have been collected.

Mr. G. N. M. Tyrell constructed an apparatus consisting of five boxes each of which contained a small electric bulb that could be lighted by pressing one of five keys. The "subject" being tested had to try to open the box in which the lamp was alight. To avoid telepathic leakage from the mind of the operator as to which key had been pressed, they were connected to a mechanical selector consisting of an arm passing over five metal contacts. The arm rotated in a closed box. When a key was pressed the arm stopped and lit whichever lamp was connected with the stud it was in contact with at the moment. To this was added a mechanical recorder. Every time a box was opened a corresponding mark was made on a travelling strip of paper. If the box contained a lighted lamp a second mark was made beside the first. As a precaution against light leakage or the perception of heat from the box a delaying device was used. The selector picked out a lamp to be lit, but it did not light unless and until that box was opened. When this happened the mark recording the opening of the box began a little before that recording the lighting of the lamp. With this apparatus over 10,000 experiments were made. The odds against the results being due to chance varied from 10,000 to

one to billions to one—the latter with one specially successful percipient. With this lady it was found that when she did not know the "delay action" device had been switched on its use made no difference to her score. She found no more difficulty in guessing which lamp was about to light, than in guessing which was actually alight.

Another series of experiments was devised by Mr. W. Whately Carington. A series of drawings was hung up in his study in Cambridge, one drawing each evening at a predetermined time. At the same hour a number of friends co-operating in the experiments made drawings of anything that came into their heads. The results were submitted to mathematical analysis to compare them with what might have been expected if chance alone had been at work. It was found that the number of "hits" far exceeded chance expectation. But it was also noticed that the number of "hits" made on the drawing exhibited the day before, and on that to be exhibited the day after were also in excess of chance expectation. Hits on a drawing exhibited a night or two before could be explained as a delayed emergence of an impression made at the time on the subconscious. But the knowledge of what was going to happen a day or two later raised very difficult philosophical problems. (S.P.R. XLVI and XLVII).

Mr. S. G. Soal, meanwhile, had been carrying on card guessing experiments for some five years with results that were little, if at all, above chance expectation. Mr. Carington suggested that he should examine his records to see whether there had been successes in guessing the card before, or the card after, the one actually guessed at. It was found that this was the case, and that the number of "hits" was far in excess of chance expectation. (S.P.R. XLVI).

We have thus three independent groups of experiments, each of which shows the existence of precognition. Those who are interested may refer to the lengthy accounts of the precautions taken and of the mathematical methods employed.

The recognition of precognition has complicated the technique of psychical research in other ways. At one time it was thought that if the experimenter did not know *at the time* whether the guesses of the percipient were right or wrong telepathy was ruled out as the source of the percipient's knowledge. But it is now necessary to insure that the experimenter shall not know the correct answers either before, during, or after the experiments,

to rule out the operation of precognitive or retrocognitive telepathy. A very neat little apparatus has been devised by Mr. Denys Parsons to meet these conditions. It has a vertical chimney that will hold 200 coloured counters—like the sweets in a penny-in-the-slot machine. At the bottom are compartments corresponding to the colours of the counters, and a lever which will sort the bottom counter into any one of the compartments at will. The counters are thoroughly mixed without being seen, and, still unseen are fed into the chimney. The percipient then sorts them into what he guesses are the proper compartments by means of the lever—of course without seeing them. Afterwards the number of red counters in the red drawer and so forth are counted. In this way the total number of correct and incorrect guesses is known, but the success or failure of each individual guess is not known at any time. At the time of the report 24,000 trials had been made, but the results did not show any significant difference from chance expectation. Other experiments have been devised but the results have not yet been published.

These developments suggest that some of the experiments designed to differentiate between telepathy and clairvoyance were defective, but the existence of extra sensory perception (usually abbreviated to ESP) may be regarded as established.

The evidence for it being now so strong many think all future research should aim at throwing light on its nature, and the factors affecting its operation. Mr. Whateley Carington in his *Telepathy* (Methuen 1945) after detailing experiments that are a model of scientific method, works out a very comprehensive theoretical explanation of telepathy and related phenomena. Basically he seeks to extend the theory of the association of ideas—even to hauntings !

A case reported recently by Dr. F. von Neureiter, Professor of Forensic Medicine at Riga, may shed fresh light on Telepathy. (S.P.R. XLVI. H. Ehrenwald M.D. *Psychopathological Aspects of Telepathy*). A young girl diagnosed as suffering from " developmental aphasia of agrammatical type " was found to repeat words and phrases silently thought of by her mother and others. It is, of course, *possible* that the disease and the paranormal phenomena are unconnected ; but if, as is probable, they are related, are both due to a common cause, or is one caused by the other ? An attempt should be made to discover whether other sufferers from the disease have similar powers.

So great is the interest aroused by the philosophic implications of precognition that Professors C. D. Broad and H. H. Price contributed a Symposium at a Joint Session of the Aristotelian Society and the Mind Association in 1937. Dr. Broad suggested that there might possibly be two dimensions of time. Mr. J. W. Dunne's theories have not been very well received by philosophers. Mr. H. F. Saltmarsh has argued that as the present moment is not a knife edge for experience, but extends over a small period of time, it may be that in our subconscious the " present " has a larger spread ; so that an event which is future to the conscious mind might be present to the subconscious. There are two difficulties: having knowledge of an event which has not happened and therefore does not exist, and the absence of any causal chain between the event and the perceiving mind. I think a theory put forward by Mr. C. A. Richardson in his *Happiness Freedom and God* may help. His argument is stated at length in mathematical form, but roughly he suggests that future events are really probabilities. As they come nearer to the observer some of them become more probable. Some have a probability that falls short of actuality by an infinitesimal quantity. Then there may be a jump of the kind dealt with in Quantum theory and the probability becomes a fact. The paths of other event-probabilities do not pass through the position of the observer, and so do not " happen ". This may help us to understand precognitive dreams where the dream modifies the event. In a case reported by F. Myers a lady dreamed of her coachman falling on to his head in the road. In the event the lady realized what was about to happen and called to someone to catch the coachman as he swayed and fell. (*Science and Psychical Phenomena* by G. N. M. Tyrrell p. 48).

In my paper on Telepathy read before the Institute in March, 1924, I suggested that minds of persons exist in some sense apart from space, so that minds a long distance apart in space might nevertheless be in " contact " with each other. If minds exist apart from the space co-ordinates of the space-time-continuum we should expect that they also exist apart from the time co-ordinate. Suppose a mind perceives a point-event in the continuum by some means other than those which ordinarily link us all so closely to the continuum (I mean the mechanism, whatever it is, of ESP) the location of the event on the time co-ordinate might be perceived with some dimness.

It might be difficult to tell whether the event was past present or future. This fits the results of statistical experiments, but precognitive dreams or prophetic declarations might be due to special factors which we are not at present in a position to explore.

The many things which we have looked at so far form part of the background against which we must consider the evidence for human survival. Our senses enable us to function in a world of space and time. Now we are faced by rigidly scientific evidence that there is a realm beyond or apart from the phenomena to which we are accustomed. We are like fishes out of water. This is so disconcerting that many scientists cannot bring themselves to investigate the data which have been so laboriously accumulated. But it is not only the philosophy of science which has been disturbed. At one time we thought we knew what the question " Does man survive death " meant. But the word " survive " is a time term. It implies a before and after position on the time co-ordinate. If man exists apart from the time co-ordinate can the term " survive " be fundamentally applicable to him ?

With these things in mind let us turn to the phenomena cited as evidence for " survival."

In " Book Tests " a communicator at a seance will tell the sitter to go home and pick out a certain book on a certain shelf, when a message will be found on a certain page. But the nature of the " message " is often not very precise, and there is uncertainty as to the number of the page, for some books have introductory pages which may or may not be counted. Still a comparison with a series of dummy tests does suggest the presence of supernormal knowledge. But why suppose it is obtained through non-incarnate minds ? Why should such minds be better able to cognize the passage in the book than incarnate minds ?

" Cross Correspondences " offer much stronger evidence. It was mentioned earlier that matter written automatically sometimes purported to give messages from other minds—usually non-incarnate minds. In the " Cross Correspondence " scripts the communicators claim to be a group of classical scholars. They profess to collaborate in producing a series of literary allusions in the script of a group of automatists. The allusions are obscure, and imply a very extensive knowledge of Greek and Latin literature. To put the pieces of the puzzles together requires an erudite interpreter. It is said that only

those who knew the communicators in life can fully appreciate some of the points. To the layman there seems to be much room for the subjective element. As in the case of the Book Tests a control experiment has been carried out, and it is reported that the results differed widely from the actual phenomena. Numerical assessment of the results is almost impossible, but those who have made the closest study of the scripts (and particularly those who knew the "communicators") are the most impressed by them.

The procedure at ordinary mediumistic "sittings" is fairly well known. The medium first goes into a trance which may vary from a slight dreaminess resembling light hypnosis, to an almost complete loss of ordinary consciousness. Both states seem to have much in common with hypnosis and sleep. The medium then shows symptoms like those of multiple personality, except that the personalities claim to be deceased persons. One personality usually calls itself the medium's "control" and acts as a "master of ceremonies." A very elaborate attempt has recently been made by Mr. Whately Carington to determine the nature of these personalities by qualitative methods, using Free Association Tests. It is held that the pattern of reaction times and response words forms a kind of psychological "finger-print." The tests were given to a medium, her control, and some communicators. After prolonged discussion of the results it was agreed that nothing had been established—except possibly that in this particular case the control was part of the medium. (S.P.R. XLII, XLIII, XLIV).

Communicators often make statements about facts which, it is supposed, would be known only to them. An attempt has recently been made to estimate the part chance might play in the statements being correct, and it was found that the odds were enormously against chance as the explanation. (S.P.R. XXIX). This establishes supernormal knowledge, but not that that knowledge came from deceased persons. It is almost impossible to give strict proof of such origin, since anything that was known to the deceased when alive may have leaked into the subconscious minds of others then alive and living at the time of the sitting. Or there might be retrocognitive telepathy between the mind of the medium (or a sitter) and the mind of the communicator before his death.

But while ESP by the living cannot be ruled out, its operation becomes a very complicated matter. We have to suppose

an enormous mass of information concerning hundreds of people reaching the subconscious mind of the medium, and becoming available when required. The Law of the Parsimony of Causes requires us to seek for the explanation that makes the fewest assumptions. In an age dominated by mechanistic materialism the theory of personal survival of death seemed very improbable. But now we find we know so little of the nature of man, of the external world (if it exists) and of the relation of the one to the other, that dogmatism as to the effect of death seems out of place. Unfortunately we often have to use the terms "probable" and "improbable" in this connection without assigning any numerical value to them, and the probabilities are rarely assessed upon the immediate data. Most people approach our subject from the standpoint of some philosophic or theological school: an ordered system of data and inferences. Suppose, for example, that a person held that we are surrounded by demons constantly intervening in our affairs. Such a person would think a theory that many of the things mentioned in this paper were the work of demons. That is a perfectly reasonable and proper attitude provided it is recognized that the probability springs from the person's general beliefs, *and not from the particular facts we have under review.*

Nothing has so far been said about what are called "Physical Phenomena." Here, unfortunately, research has been very difficult because of the amount of fraud that is met with. One example of the best kind of work may be mentioned. The experiments were carried out by Dr. Osty and his brother with the medium Rudi Schneider. An infra red beam was arranged to play on a light cell in the circuit of a galvanometer, the movements of which were recorded on a moving strip of paper on which the medium's breathing and a time base were also recorded. It was found that the intensity of the ray varied rhythmically with the medium's breathing.

The view that matter can be acted upon in some way at present unknown has recently been supported by some statistical experiments that can be submitted to mathematical analysis. In 1943 the American *Journal of Parapsychology* began to publish a series of experiments in which it was "willed" that randomly thrown dice should come to rest with a certain face uppermost. This effect is said to be due to psycho-kinesis (abbreviated to PK). These experiments are reviewed, and some English

experiments described in Part 170 of Vol. XLVII of the Proceedings of the S.P.R. This is a small Part. It is published at 2s., and any who are unfamiliar with the Proceedings might care to purchase it. Dr. R. H. Thouless considers that the reality of the effect has been abundantly proved by the American experiments. Experiments in this country have not yielded very clear results.

I hope this Paper may have given some readers a rough idea of what Psychical Research is all about: but I hope I have also made them realize that no reliable judgments can be formed on the subject without a careful study of the evidence. There is no substitute for a knowledge of the Proceedings of the S.P.R., which can be consulted in most of the larger Public Libraries; but I would recommend the beginner to read *Science and Psychical Phenomena* by G. N. M. Tyrrell (Methuen) 1938.

Discussion.

The Chairman (the Rev. J. Stafford Wright) after thanking Mr. P. O. Ruoff for his reading of Mr. Leslie's paper, said: We are most grateful to Mr. Leslie for the way in which he has compressed such a wide range of facts into the limited space at his disposal. He appears to have covered the whole field, with the exception of what is commonly called Psychometry. In Psychometry the sensitive takes an object, and from contact with it can discover facts about the past, present, and future of its owner, or of others who have had any special contact with it. Dr. Osty did some practical work work in this branch of Psychical Research, and in the last few years Dr. J. Hettinger has given the results of experiments in two books, "The Ultra-Perceptive Faculty," and "Exploring the Ultra-Perceptive Faculty" (Rider).

Since Psychical Research has now established itself as a branch of science, it is important that some Christians should be in touch with the work that is being done. Apart from the further nail that it has driven in the coffin of Materialism, its investigations into precognition have an important bearing on predictive prophecy in the Bible. It is, for example, no longer possible on scientific grounds to deny the possibility of such things as the naming of Josiah or of Cyrus centuries before their birth.

I should like to comment on the closing paragraphs of Mr. Leslie's paper. In approaching the question of the identity of the alleged

communicators at seances and elsewhere, the Christian, who accepts the Bible as God's revelation, is bound to have a certain bias, in view of the emphatic Biblical condemnation of spiritualism. But, even apart from the Bible, Psychical Research suggests that many of the messages need not be taken at their face value, Mr. Leslie (at the bottom of page 193) feels that the theory of E.S.P. by the living is a very complicated matter. This is not necessarily so, if, as appears likely, communion is possible between mind and mind at the subconscious level.

Let us suppose that A visits a medium, or clairvoyant, M. Their contact establishes a link between the two at the subconscious level, and at this level some at least of A's thoughts and experiences are drawn into M's subconsciousness, and from there emerge into M's consciousness as thoughts or words. M differs from most of us in the capacity to draw up into consciousness a part at least of what is in the subconsciousness of another. A, B and C, without this gift, are likewise linked in their subconsciousness, though they do not realise it. Each person may be thus likened to a telephone exchange, with fresh lines being added continually, though reason and experiment would suggest that normally only those lines with which we have some special associations become effective.

When A goes to M, M is not only linked to A, but through A's "exchange" may be connected up with another "subscriber," B or C, and thus perceive something of him. Suppose, however, that B has died. His "line" at A's "exchange" does not go dead, though it does not follow that the discarnate B is at the end of it now. A characteristic of this subconscious level is, as Mr. Leslie has shown, that the normal time sequence, with its rigid distinction of past, present, and future, is not operative. It is thus likely that, even after B's death, M can still make contact with B's "line" through A, as though B were still alive. Here the telephone analogy breaks down. Reception at M's end is never more than partial; no clairvoyant or medium is infallible. M must always express as best he can what seems to him to be coming through. If M knows, or believes, that B is dead, the messages will clothe themselves in M's mind in a form suitable for a person "on the other side." The source is the living B via the link A, but the form is an alleged message from the dead B in the clothing given to it by M's mind.

It is worth quoting from the autobiography of one of the most introspective mediums, Mrs. Eileen Garrett. On page 168 of " My Life as a Search for the Meaning of Mediumship," she says, " In examining my own process of clairvoyance, I have become aware that I draw the knowledge which helps me build the images of the dead relatives and friends of those who need help, from the subconscious minds of the sitters." And again on page 185, " I began to wonder whether the whole structure of mediumship might not depend on a form of telepathy, and whether the medium does not draw information for communications from the subconscious mind of the sitter."

Cross Correspondences, mentioned by Mr. Leslie on page 193, are, I think, the hardest to explain on these lines, but I believe that, in cases where demonic interference is ruled out, it is along these lines that the true explanation will ultimately be found. The theory accounts for much that is puzzling in spiritualistic and clairvoyant communications.

WRITTEN COMMUNICATIONS.

Mr. G. N. M. TYRRELL wrote: Thank you for your interesting paper. I find my own attitude on the theory of precognition is rather that of rejecting *all* theories and having nothing to put in their place!

I have not read Mr. C. A. Richardson's book, but I must confess that I find it difficult to believe that cases of precognition are to be explained as subtle estimates of probability. By " probability " we mean inference based on knowledge of present facts, and I cannot convince myself that inference has anything to do with precognition. There is also the difficulty that some of the precognitions go into minute detail, and this detail is the result of human choice. I cannot quite imagine what sort of data the precognising subject must get hold of to enable him to infer that A will slip on a banana skin in Alpha Street when he could better have reached his destination by going along Beta Street.

One thing I am suspicious of is the assumption people readily make that the subject precognises an event *in* the space-time world, *directly* by a sort of time projected act of perception. This is on a par with the assumption that telepathy is a direct acquisition of someone else's conscious thought, again by a means analogous to sense-perception. You rather suggest this in the sentence beginning " Suppose a mind perceives a point-event . . . " on page 191 of your paper.

The statistical type of experiment does suggest this ; but I think that all these experiments are a dangerous guide to *theory*. All the rest of the evidence points clearly, to my mind, to E.S.P. as not being at all analogous to sense-perception but as being one case of the emergence of material from the " unconscious " or subliminal region of the self. In this subliminal region I suspect that contact *is* made with the space-time event in the future, or in the case of telepathy, with the conscious thought in the agent's mind. The source of all the information is in something which lies *behind* the space-time-world events.

That, it seems to me, is the point of view which the evidence supports, and the one which we should have in mind when we plan experiments or devise theories.

This, I am afraid, is not a very helpful comment. But then my own opinion is that we shall never understand precognition by means of our existing stock of ideas. We need conceptions which are at present foreign to us. That is why I doubt the competence of mathematical theories to deal with the subject.

Dr. R. H. THOULESS wrote : I have read your paper with interest. The view about future events as being mere probabilities before they happen is the view I hold myself which I have often expressed verbally but never (I think) in writing. . . . . I think it gets over some but not all of the difficulties of precognition (which I am convinced does take place).

Dr. S. G. SOAL wrote : I have not yet read C. A. Richardson's book, but for myself I find such a theory very difficult to apply to the supposed phenomena of precognition. Surely there are an infinite number of *possible* futures and of these a large number would possess about equal probabilities of being realised. How is the clairvoyant able to pick out the one that actually happens out of such a large number ?

If one draws a red counter out of a box containing equal numbers of counters of five colours, how has the future event of drawing a red counter a larger probability than that of drawing a yellow counter ?

If visual clues are not possible I can't think there is any greater probability. Yet this is the kind of thing the clairvoyant does.

With regard to Von Neureiter's case, have you read Hans Bender's very important article in the *Journal of Parapsychology*, March,

1938 ? . It seems practically certain that the case was one of auditory hyperesthesia. The mother in giving encouragement vocalised the next word. This was detected again and again by the phonetic experts of the Commission, when the girl was isolated from the possibility of picking up these whispers and vocalisations the phenomena did not occur.

Professor H. H. PRICE wrote : Precogniton is one of the most difficult subjects I know ! The idea that precognition is to be explained by means of the notion of Probability is obviously an attractive one. But the question is What *sort* of probability ? (The word " probability " clearly covers several rather different meanings, *e.g.*, in one sense of the word, all probabilities are by definition measured by fractions, in another they are not. The Laplacian concept of probability is different from the one expounded by writers on the Frequency Theory, etc.). I think that what you say is plausible so long as one is using the word " probability " in an ordinary common-sensical way, not susceptible of exact measurement, as when one speaks of the probability that the train will be late, or that it will rain before sunset to-day. It is this same (non-measurable) notion of probability which lies at the basis of such conceptions as " a danger " or " an opportunity," likewise as such conceptions as " easy " and " difficult " (it is possible that you will fail unless you make a good effort). Now I think that we may conceive of probabilities of *this* sort as being somehow inherent in objective facts and situations ; and we may suppose that some minds have the power of becoming aware of such probabilities precognitively—*e.g.*, of precognizing that such and such a future event will involve or contain a danger of a particular sort for Mr. A, say, a danger of his being struck by lightning, or again an opportunity for him to meet Mr. B.

I think a further step is now required. Precognition, whatever it is, seems to be a function of " the unconscious." Now it looks as if unconscious mental processes make use of a symbolism of *mental images*—which may or may not be translated into verbal symbolism at the conscious level. And a symbolism of mental images (a pictorial as opposed to verbal forms of representation) has one very peculiar feature. The distinction between past, present and future cannot be drawn in it ; if an event is pictorially represented it must

be represented as *present*. More important still, what logicians call "modal" distinctions—those between actual, possible, necessary and probable—cannot be represented in pictorial symbolism either. If something is to be represented in such a symbolism at all, it must be represented as *actually existing*. (Cf. a railway poster of a health resort. The sunshine, blue sky, etc., are in fact only probable, and not very highly probable either; but the poster has to represent them as actual—thereby misleading the simple-minded traveller.)

It follows that if "precognita" are in fact only probabilities then—dangers, opportunities, etc., they will none the less be represented as actual "cast-iron" happenings owing to the nature of the symbolism which the precognising part of our mind employs. (Also, the precognising subject will not be able to distinguish past, present and future—which perhaps accounts for the queer remarks of mediumistic people about the "unreality of time.")

I think it is necessary to add this further point about the necessary limitations of image symbolisms, if the Probability Theory of precognition is to be made as plausible as it can be made. Whether, even so, it will really work, I am not by any means sure. And (to come back at last to your paragraph) will it even begin to work if we start from the *Physicist's* notion of probability, which (*a*) is a *frequency* notion—in talking about probabilities he is roughly talking about "averages"—(*b*) is applied primarily to *microphysical* occurrences, whereas precognition is concerned entirely with *macroscopical* ones (*e.g.*, the fall of a coachman from his seat). And if it should turn out that the microphysical happenings which physicists talk of are somehow "logical constructions" out of large scale macroscopical observables (as Idealists and Phenomenalists think)—then where are we? At any rate, the whole epistemological problem of the reality or the "status" of microphysical entities is on our hands. Whatever the right solution of it is (for myself, I prefer a more Realistic one; but the difficulties of it are very great, and some of the Physicists themselves would not agree with me) I ought to say, however, that I have not read Mr. Richardson's book; perhaps he clears these matters up.

I hope you will not think it impertinent if I say that the Address as a whole seems to me an admirably clear and balanced outline of the field of Psychical Research.

Professor C. D. BROAD wrote: I have not read Richardson's book, and I must confess that I do not understand his theory as summarized on p. 191. As it stands it seems to be self-contradictory. First we have the statement "future events are . . . probabilities." Then it is said: "As events come nearer to the observer some of them become more probable." If we combine the first statement with the second, we get, "As probabilities come nearer to the observer some of them become more probable." I cannot make sense of this. What is meant by a *probability* coming nearer to an observer? And what is meant by a probability becoming more probable?

I should have thought that what is probable is always a proposition, *e.g.*, the proposition that it will be raining tomorrow. And I should have thought that the probability of any proposition was always a relative to some other proposition or set of propositions, *e.g.* "relative to the fact a proposition that the glass has been falling rapidly this evening it is highly probable that it will be raining at noon tomorrow," but by tomorrow morning at 9.0 a.m. the glass may have risen again, and relative to *that* fact it may be highly *im*probable that it will be raining at noon tomorrow. Perhaps Richardson means only that in some cases a person may successively become aware of a series of data such that the probability of a certain kind of event happening at a certain time in the future is greater and greater with regard to each of these successive data.

There is one other small point. I note that at the bottom of p. 190 you describe Neureiter's case as "recently reported." This is hardly correct. Neureiter's pamphlet appeared in 1935, so the case must be earlier than that date. I do not know whether he was a careful and trustworthy person.

Mr. C. A. RICHARDSON wrote to say: That, in the outline of his theory on p. 191, it should have been said that all future events become more probable as they approach the observer—not merely some of them and that the phrase "an infinitesimal quantity" should read "a finite but very small quantity." Apart from this he thought the general idea had been conveyed as accurately as was possible in so small a space.

AUTHOR'S REPLY.

I thank the Chairman for his kind remarks. I left out Psychometry because I was not satisfied that telepathy was excluded from

the experiments. I still think it possible to push E.S.P. explanations of "communications" to a point where one feels that any explanation is being thought to be preferable to the hypothesis of communication from the dead. It may be that Mr. Wright thinks the Bible teaches that the dead cannot communicate with the living, and that, therefore, "communications" must come from non-human sources. I do not think the Bible so teaches, but I felt I ought not to limit my arguments to those who accept its authority.

I am deeply indebted to the distinguished writers who have been kind enough to reply to my request for help on the subject of precognition—particularly to the late Prof. Price who wrote when seriously ill. I thank Dr. Soal for calling attention to the doubtful character of the von Neuriter case. I had no idea that the S.P.R. would publish a case with no indication that it was under grave suspicion. My faith in the Society's Proceedings has received a shock.

In spite of the great interest inevitably attaching to "survival," I feel very strongly that far more important are the indications that reality is deeply and fundamentally different from what we have supposed it to be. Our minds are so adapted to living that we can hardly form any conception of the reality in which we live and move and have our being.

Since the Paper was read, G. N. M. Tyrrell's *Personality of Man* has been published as a Pelican Book. *The Experimental Situation in Psychical Research*, by Dr. S. G. Soal (F. W. H. Myers' Lecture, 1947, S.P.R.), should be read.

873RD ORDINARY GENERAL MEETING

HELD AT 12, QUEEN ANNE'S GATE, WESTMINSTER, S.W.1 ON MONDAY, 12TH MAY, 1947.

R. E. D. CLARK, ESQ., IN THE CHAIR.

The following elections have been made: E. J. J. Daley, Esq., Fellow; A. Oakley John, Esq., M.B., B.S., M.R.C.S., L.R.C.P., Fellow.

SEX MORALITY.

By D. R. MACE, Esq., M.A., B.Sc., Ph.D.

WHATEVER demerits this paper may have, it can at least be claimed that it is upon a topical subject. The question of standards of sexual conduct is a burning one at the present time; and there is hardly a field in which there is more confusion of thought or controversy in discussion. The social life of our time has been characterised by a widespread and startling landslide away from the traditional Christian standards of sex morality.

I must begin by defining the scope within which this paper will attempt to discuss the subject. Sex morality covers a very wide field. It might be taken to include problems of purely personal morality, such as masturbation and homosexuality, and also problems more directly within the sphere of social morality, such as prostitution and illegitimacy. Some of these questions will arise incidentally in the course of my paper. But the field which I wish to cover will be that of normal sex relations between men and women, meaning normal in the sense that no sexual deviation or perversion is involved. Within this field, I shall endeavour to show that the traditional Christian standard is still a valid one, and that it conforms to the best interests of individual life and of the welfare of the community. That is to say, it will stand the strictly utilitarian test.

Indeed, I believe it must do so. Sex is a phenomenon which, in human life, has significance only within the limits of this

material and temporal world. "In heaven they neither marry nor are given in marriage." That is the authoritative pronouncement which defines the limits of sex. Consequently, it is logical to assert that the right use of sex must conform to the conditions which obtain within the natural order. In certain individual cases it may be justifiable to renounce the fulfilments of sex for the attainment of a spiritual end. But for the generality of mankind, sex exists to be *used*. And since its use belongs properly and exclusively to this life, the conditions of that use must be agreeable to the ends for which human life was designed. It must make men and women happy and make them good. That we believe to be the divine purpose. And sex must be so used that it contributes to that purpose. To use it otherwise is to misuse it.

First, let us consider briefly how sex has in fact been used in human life and human society in the past.

It was believed by those who held the evolutionary theory of marriage in the last century—notably McLennan, Herbert Spencer, and Lewis Morgan—that there was a time when the human race passed through a stage of general promiscuity, when there was no clearly defined pattern of sexual behaviour such as we know in civilized communities. That theory is now no longer held. It could not be sustained in the light of ascertained anthropological and sociological facts. But it was abandoned only after a good deal of controversy; and that controversy stimulated a good deal of research. The result is that much information was amassed about codes of sexual behaviour both in ancient and modern society, civilized and uncivilized (a distinction, incidentally, not now capable of as clear definition as it once was!). Much of the result of this enquiry was assembled in Edward Westermarck's "History of Human Marriage," which established the hypothesis, now probably universally accepted, that no human society has ever existed in a stable and reasonably permanent condition, without having some clearly defined code of marriage and sex morality. This is the first elementary point at which it might be said that the study of anthropology and sociology in this field confirms the Christian teaching; namely, that no human society can survive in a state of sexual amorality. Some kind of defined code of sexual conduct is essential to community life.

But history has shown that there have existed many and different codes and standards of sexual behaviour. These have

varied largely according to the circumstances of the societies in question. The studies of Hobhouse, Wheeler, and Ginsberg, in their "Social Institutions of the Simpler Peoples," make it plain that conditions of life have tended to determine codes of sexual behaviour to a considerable extent. Thus certain patterns recur in the presence of certain environmental factors. This is of course what we should naturally expect. "Humanity has been led, in all ages," says Dr. Lofthouse, "by what it has from time to time considered to be its interest or advantage. Men do not sit down as Herodotus described the Persian nobles sitting down, to discuss under what institutions they shall live . . . they feel their way forward through the jungle of circumstance, not on the high road of theory."

Nevertheless, it is pertinent to ask whether, amid the medley of codes of sexual conduct which the study of anthropology and sociology reveal, there is any basic pattern which tends to fulfil, better than the others, the fundamental ends of human life. This question was taken up by J. D. Unwin; who, as a result of formidable researches, recorded in his "Sex and Culture," arrived at an interesting and, from our point of view, highly significant conclusion.

Unwin examined socially the principle enunciated by Freud that civilization arises from the restraints placed upon crude biological impulse, and the redirection of the resulting potential into cultural channels. Confining himself to the sex impulse, Unwin asked whether there was some particular code of behaviour which, more than any other, resulted in the highest output of what he called cultural energy. After a study of all human societies, ancient and modern, he came to the conclusion that there was. And his conclusion was that the standard in question was what he described as "absolute monogamy"—in fact, the Christian standard of chastity before marriage and fidelity after it. In his own words, "There is no recorded case of a society adopting absolute monogamy without displaying expansive energy. Whenever the evidence is complete we see that such a society, on arriving in the historical arena, was regulating the relations between the sexes in this particular manner." Then he puts the other side. "In human records there is no instance of a society retaining its energy after a complete new generation had inherited a tradition which does not insist on pre-nuptial and post-nuptial chastity."

I am not here concerned about details of Unwin's work—only his general conclusion. I am not aware that this conclusion has ever been seriously challenged, let alone refuted. And, from a sociological point of view, it means simply that, other things being equal, the society which accepts the Christian standard of sex morality will achieve the highest level of culture.

Now let us see how all this applies to the life and custom of our own time. In recent years, as I have already indicated, we have seen the Christian standard of sex morality seriously challenged as a valid principle, and increasingly ignored as a working code of behaviour. There is not time now to trace the long history of this movement, or to analyse the complex network of causes which have brought it about. Intellectually, it reached its culmination in the doctrines of the "new morality" which were much in evidence in the 1930's, but of which little is heard today. Its *practical* consequences are only now really appearing, in the free sex relations which are so widespread at the present time.

It would be idle to suggest, of course, that there have not always been serious departures from the accepted moral code. Lecky makes this clear when he says that "In all nations, ages, and religions a vast mass of irregular indulgence has appeared, which has probably contributed more than any other single cause to the misery and degradation of man." But what is new in the modern scene is the assertion that these departures from conventional morality do not, as Lecky suggested, lead to "misery and degradation"; but that they in fact result in the betterment of society. It is this contention with which I wish to join issue.

As it happens, there is sufficient evidence for us now to be able to see how this new attitude to sex is working out. No one knows precisely the extent to which, in Britain today, the standards of chastity and fidelity have been overthrown. But there are hard and indisputable facts which give us some indication. For example, the returns of the Registrar-General since 1938, when the Population Statistics Act was first introduced, enable us to estimate the number of extra-marital pregnancies which occur each year. In a statistical analysis published in 1945, I showed that, over a period of six years, the number of women becoming pregnant outside marriage each year in England and Wales was not much less than one-tenth of a million. These are, of course, only cases where neither the man nor the woman used any contraceptive, or those where the contraceptive

employed failed to prevent pregnancy. There is good reason to believe that this is a mere fraction of the total number of unmarried women who have sex relations. The total may well be as high as a million. And since in all there are only about four and a half to five million unmarried women in England and Wales, between the extreme age ranges of 15 and 49, it will be seen that the " unchaste " group may well be quite a large one. There is no reason to believe that the number of men who have extra-marital sex relations is any less.

This means that there are enough people in the community who have abandoned the Christian standard for us to begin to see how the new policy is working out. We cannot, of course, hope to see any of the long-term consequences to which Unwin pointed. He made it clear that it takes several generations for the decline in culture which follows the removal of sexual restraint to manifest itself plainly. But we may rightly enquire whether there are any more immediate personal and social effects which *can* be discerned. I believe the answer is in the affirmative.

Let us consider the social consequences first. The point which has become outstandingly clear is that, in our society, there is a close and inextricable relationship between the two standards of chastity and fidelity. Many exponents of the new morality tried to separate these. They proposed to allow free sex relations in youth *before* marriage, but to require strict fidelity *after* it. They made much of the fact that in certain South Sea island communities the young people are permitted to enjoy a period of sexual freedom, but after marriage are required to settle down to constancy in their subsequent relationships. But such a state of affairs is quite impossible in our society. In these tribal groups, the adolescents are generally separated off for a period into almost completely self-contained communities. In any case, marriage takes place very early, so that the period in question is necessarily short. In our highly complex society, on the other hand, the married and the unmarried of all ages are inextricably mixed up together. It is simply impossible to have one standard for the unmarried and another for the married. To permit sexual freedom to the unmarried group will inevitably mean a tendency for the married group to adopt the same code. Thus many young people accustomed to sexual freedom will find that, after marriage, they will desire to follow the same pattern—especially when marriage becomes difficult for any reason. And the man who is accustomed to make free

with women will tend, when he finds himself attracted to one who wears a wedding ring, to ignore this fact. So free standards among the unmarried will inevitably come in time to invade the security and stability of the existing marriages in the society in question.

There is, in fact, no need to assert this in theory. It is manifest in the life of our time. We have witnessed in recent years a lessening of respect for the marriage tie, so that men and women nowadays frequently do not hesitate to make amorous advances to persons of the other sex whom they know to be committed to a binding marriage relationship. And there can be no doubt that the abandonment of fidelity today is the direct and logical consequence of the abandonment of chastity yesterday. In fact the two standards are not separate ones at all. They are different aspects of one code of morality. This the Christian Church has always proclaimed. And the events of our times give it all the confirmation we need.

It follows therefore that the overthrow of chastity leads to the insecurity of marriage, and the consequent instability of the family. The results of this, in personal misery, in hardship imposed upon little children, in general social tension and unrest, are to be seen on every hand. I do not, of course, assert that the present disorder in family life is due to this cause alone; but I do suggest that the abandonment of the standard of chastity in our society in the period between the two wars has contributed directly and considerably to the present crisis in family life.

Now let us turn to the individual aspect of this matter. There is not time to go into the many complex psychological issues which are involved in the study of sexual behaviour. This would require another paper to itself. I can only point now to one or two salient issues which are worthy of our careful consideration.

I have referred to the fact that in simple communities marriage generally takes place soon after puberty. In such societies, the problem of pre-marital chastity as we know it hardly arises. The crux of the difficulty for us lies in the fact that an interim period must elapse between the time when young people become physically capable of sex activity, and desirous of it, and the time when they are emotionally and mentally sufficiently developed to embark upon the responsibilities of marriage and the maintenance of a family.

We shall achieve nothing by ignoring or minimising the problem which this involves for young people. And we shall do well to face the fact that this period has in the past been unwarrantably protracted for social and economic reasons which are not sufficiently compelling. To prolong unnecessarily the time when marriage is possible for young people is dangerously to exacerbate a human problem which is quite serious enough in any case. No enlightened Christian community will wish to neglect its duty in this regard.

Let us state quite simply the question which we have to answer. "Since young people may not marry for five, ten, or fifteen years after the sex impulse has become vigorously awake within them, why should they not be allowed to indulge it? It is a very powerful impulse, and its exercise leads to pleasure. Why restrain it?"

For centuries the stock answer to this question was that the unrestrained exercise of the sex impulse might well lead to a great increase of illegitimacy and of venereal disease. These possible consequences of unchastity were both very real and very formidable; and for all practical purposes they served the ends of keeping the community reasonably chaste. But now both of them have lost their sting. Illegitimacy, it is contended, can be prevented by the use of efficient contraceptives. Venereal disease can now be cured. So the twin bogeys which guarded the gates of chastity have been robbed largely of their terrors.

It is useless to pretend that this does not confront the Christian with a major crisis. If the negative prohibitions upon which his code has rested have now largely collapsed, the implication is that his code is no longer valid. Millions of people today are in fact fully persuaded of this. And they are acting accordingly.

The result is that we are now gradually coming to see that the real case for chastity rests upon another and a deeper foundation. The fundamental evil of unchastity is being at last unmasked. It is that it destroys the security of marriage and the family.

We have seen this to be true socially. But it is also true personally. There is a growing consensus of opinion amongst responsible psychologists today that sexual freedom before marriage results in impairment of the individual concerned for the achievement of a successful marriage relationship. This was recently stated quite baldly by the late Professor Ernest R. Groves, of North Carolina University—generally recognized as

America's foremost authority on marriage. In the introductory statement to his college course on Marriage and the Family, referring to the achievement of happy marital adjustment, he asserts that "pre-marriage experience is no advantage but frequently instead the chief cause of marital maladjustment."

The reason for this, in psychological terms, can be fairly clearly expressed. In the development of the love life, most of us pass through a stage of what Havelock Ellis calls "poly-eroticism." This means the tendency to rapid and frequent change of the love-object. The phenomenon is well known in adolescence. The boy or girl may fall in and out of love, in rapid succession, with a bewildering number of persons of the opposite sex. What is happening is that the emotional compass needle is swinging wildly in search of the true definition of the particular mate who will become the mature love-object of the individual concerned. But if the youth expresses these passing infatuations in sexual union with the persons concerned, or with some of them, the process of growth towards the achievement of emotional maturity and the clear definition of the proper love-object is arrested. The dynamic driving the personality towards adulthood is weakened. The result is that the growth of the love life ceases, and there is a "fixation" at the poly-erotic level. The individual consequently remains adolescent so far as his capacity to love is concerned. There are plenty of these individuals about, and their reactions can easily be studied. I think most psychologists will agree that these adult men and women who seem unable to extricate themselves from a promiscuous pattern of behaviour are always suffering from emotional immaturity. They are incapable of maintaining stable marriage relationships because they are always drifting back to the poly-erotic phase. Kipling expressed this with simple directness in the verse

> "I've taken my fun where I've found it,
> And now I must pay for my fun,
> For the more you 'ave known o' the others
> The less will you settle to one."

Of course it is generally contended that pre-marital sex relationships need not mean actual promiscuity. That is true enough in theory, but it is surprising how often it breaks down in fact. Probably the most exhaustive research yet undertaken in this field is the American enquiry by Bromley and Britton, published under the title "Sex and Youth." This revealed that,

among undergraduate men who had pre-marital experience, six out of seven had to be classed as promiscuous. That is to say, only one out of seven who had embarked on a sex relationship outside marriage had been able to resist the pull to further adventures. In youth, once the line is crossed, the tendency is to go the whole hog and follow the rapid, kaleidoscopic variations of the love-object. And once this habit has been set up, the damage is done.

However, there are those who, while they agree about the evils of promiscuity, contend that the risks must be taken. Their plea is that sexual experience is advisable as a preliminary to marriage, because it is the only way of testing compatibility between the partners. For example, a speaker in a B.B.C. discussion said that, in her opinion, two people who embarked on marriage without having slept together beforehand were asking for trouble. Do the facts substantiate this ?

Strangely enough, this argument is presented on two different and in fact opposite grounds. It is worth looking at each in turn.

First, it is contended that people must test their sexual compatibility before embarking upon marriage, because the latter involves a sex relationship. At first sight this is a very plausible argument. How can two people know themselves to be sexually matched, it is asserted, unless they try out this side of the relationship in advance ?

But, in fact, what *is* sexual matching ? It is an exceedingly difficult thing to define. Certainly it has little to do with the comparative dimensions of the physical organs. It might be said to relate to the strength of the sex impulse in the individuals concerned. But this again is a very difficult factor to determine. And, moreover, it is a factor which varies in every individual from time to time, and is particularly subject to emotional conditioning.

Of course, it could be contended that capacity to perform the sex act is important to successful marriage. No one will question this. So universally is this recognised that, if the act cannot be performed, the marriage can be annulled. So it might rightly be claimed that this remote contingency is allowed for. But in fact experimentation before marriage might hinder rather than help at this point. I have known cases where functional impotence has arisen in attempts at pre-marital sexual union when in fact probably all would have gone well had the couple waited

to embark upon their first intimacies within the more secure emotional setting of the marriage relationship.

If it is contended that two people should discover whether they can achieve harmonious sex adjustment before they marry, the matter becomes more complicated than ever. Those of us who deal with marriage problems frequently encounter cases where husband and wife take literally years before achieving the mutual orgasm which is regarded as the criterion of really satisfactory sex adjustment. Yet in the end, when they do arrive at it, it becomes the foundation for what is frequently an extremely successful marriage. And it is almost always found in any case to be dependent on the achievement of real emotional harmony and response. Experiments before marriage in such cases would almost certainly confuse the issue hopelessly.

The best way to see clearly the fallacy of this argument is to think of a hypothetical case in which this became the decisive factor. Here is a man who cannot decide between two women whom he regards as potential wives. According to the exponents of the doctrine of sexual experimentation, what he must do is to try out the possibility of sex adjustment in both cases, and settle the issue on the result of that experiment.

In point of fact, he may achieve comparatively good sex adjustment with one woman, and yet, in fact, he may have a superficial basis of personal compatibility with her. The result is that, as the marriage proceeds, and the personal quality of the relationship wears thin, the sex relationship, which is always a function of personal response, begins to deteriorate and may ultimately break down. In the case of the other woman, the underlying basis of personal compatibility may be much more satisfactory, and yet attempts at sexual experimentation may fail dismally. Yet, were he to marry that woman, the growing depth and richness of their personal fellowship would in time find expression in their sex relationship, which in the end would become much more satisfactory than in the other partnership. Therefore in such a case (and it is obviously a test case), to follow the advice of those who advise trying out sexual compatibility beforehand would actually lead to the choice of the least satisfactory of the two potential marriage partners.

The other ground on which the argument for pre-marital sex relations is preferred is not that the couple must test out their physical compatibility, but that on the contrary they are unable to judge of their personal compatibility so long as they are

tortured by unsatisfied physical desires. They are said to be blinded by sexual cravings, and therefore unable to see each other in a detached way. It is therefore argued that they should satisfy the physical craving, and thus be enabled to look at each other objectively.

It may be conceded that strong sexual desire is capable of obscuring rational judgment. But it is ridiculous to suggest that two people contemplating marriage, and seeing each other as frequently and under as many varied circumstances as people in that state generally do, are all the time in a state of urgent and clamorous sexual desire. Of course they are not. And the implication that satisfying sexual desire makes immediately for clear and detached judgment is highly questionable. It may result in all kinds of mental conditions, from heightened desire for repetition to nausea and reaction. In fact, it is a well-known psychological fact that the fulfilment of sexual desire tends to diminish the interest of the man in the woman, and greatly to increase the interest of the woman in the man. So in this sense it works unequally.

But the underlying principle in this contention is in any case seriously fallacious. It is that sex can arbitrarily be disconnected from the other elements of personal interaction, and dismissed from the picture by being physically satisfied. This is going back to a theory of sex which was much in vogue some twenty years ago, and which regarded it as a mere incidental act unconnected with the wider and deeper aspects of human personality. That theory can be said now to have been thoroughly and finally exploded from the psychological point of view. Therefore when two people embark upon a sex relationship they are inevitably deeply affected by it, and their judgment will inevitably be strongly coloured by the quality of the sex experience in question. This takes us back to the difficulty we have already discussed, that the achievement of a permanent and satisfactory harmony in the sex relationship often takes a long time, and is dependent ultimately upon the whole quality of the fellowship of the two persons concerned, at the other levels of relationship which are inevitably involved.

The argument might be pursued endlessly in the discussion of all kinds of specific instances. But perhaps I have said enough to indicate that, in terms of basic principle, the case for premarital experimentation has never been convincingly established.

In conclusion, let me quote the considered judgment of three of the leading American authorities in this field. I select American authorities deliberately because the study of this subject has been carried further in America than it has in this country—probably because the problem emerged at an earlier date and has reached more serious dimensions.

First, here is the judgment of Professor Norman Himes, whose written works make him a high authority in the field. "One of the greatest superstitions of our age," he says, "is that marriage needs a test of passion. Popular and unscientific literature on sex is mainly responsible for the prevalence of the notion. It is relevant to observe that the primary tests of successful marriage are not tests of passion at all, but rather tests of character and personality. . . . It is a common rationalisation of many young people that pre-marital sexual experience will enable them to adjust better in marriage . . . No good purpose can be served by fooling themselves with the belief that such conduct prepares them for marriage."

Secondly, here is Professor Hornell Hart—"The fear of some young people lest inexperience in sexual intercourse may leave them unprepared for marriage is groundless. The vital part of the love relationship is the creative interweaving of the personalities. This is a fine art. . . . When two normal people are able to achieve that art together, they may almost always look forward to deeply satisfying sex relations after marriage. . . . Pre-marital sex relations are likely to damage subsequent affection and to obscure the psychological and social aspects of the search for well-matched mates."

Finally, here again is Professor Ernest Groves—"I believe that no form of trial marriage can help youth to meet its pre-marriage problems, but instead, trial marriage is a menace to the idealism, ethical character, and feeling of commitment that successful marriage demands ; sex adjustment is not a technique, but an achievement through a unique fellowship which involves the total personality of both the man and the woman."

It will therefore be clear that there is no serious danger that our Christian standard in this matter can be finally overthrown. That we may depart far from it is possible and even probable ; but the further we do so, the more bitter will be the price which we shall have to pay, both individually and socially. There is already good reason to believe that, among more responsible people, the implications of that departure are being fully realised.

and an effort is being made to call a halt. In Soviet Russia, in America, and now in our own country, there is a marked tendency to return to the basic Christian standards which it was thought could be lightly overthrown and dispensed with. But this cannot be. And once again, the stone which the builders rejected is being brought back to become the head of the corner.

Discussion.

The Chairman (Dr. R. E. D. Clark) said: This paper of Dr. Mace is one of very great value and I should like to take this opportunity of thanking him for it on behalf of the Victoria Institute. He has presented his case with admirable lucidity and it is difficult for me, at least, to imagine any effective rejoinder from those who are opposed to his views.

No one would expect Dr. Mace to cover all the ground in so short a paper but it would be interesting to hear his views on one or two topics which he has not had space to mention.

First of all he has mentioned the twin deterrents to sexual intercourse in days gone by—fear of a child and of venereal disease. Is it possible that the theory of the inheritance of acquired characters may have been equally strong as a deterrent and perhaps in cases, stronger? At one time it was customary to paint harrowing pictures of how the sexual sins of the fathers would be visited upon the children.

Secondly, I. D. Suttie pointed out the extreme need for love in early life. Observation would seem to suggest that it is those young people who do not find love in their homes who seek for it elsewhere and, therefore, encounter sexual temptation. Must we not conclude that Christian parents should show a great deal more love to their children, and should continue their affection to a later age than is normal if the children are unlikely to be in a position to marry early?

Thirdly, Dr. E. J. Dingwall, in his *Racial Pride and Prejudice* has presented some evidence that racial prejudice is often due to sexual jealousy—the white man supposing that the black enjoys unlimited sexual freedom. I do not know whether this interpretation can be taken as authoritative but, if so, it might appear that the subject which Dr. Mace has discussed may be bound up with the recent rise of racial hatred throughout a large section of the world.

For, in the old days, it was customary to regard the blacks as "sinners," white men being proud of the sexual restraints of their civilisation. To-day, however, many white people imagine that they have a "right" to enjoy freedom in their sexual relations but are held back by the taboos of society—taboos from which the native is free. One would imagine that this changed outlook would be bound to cause an increase of sexual jealousy and, therefore, on Dingwall's theory, of race feeling. But I am not, of course, suggesting that race feeling owes its origin to such causes—the origin is to be found in slavery more than in any other factor.

Dr. A. OAKLEY JOHN said: May I ask for your opinion on this point. I can quote an actual case I have in mind, but would really appreciate a view concerning the general principle. Your Council, Dr. Mace, has as its object the treatment of people who are suffering from a "diseased" Sex and Morality, and I think it is fair to divide your work into prophylactic and curative. In the former part you strongly advocate premarital instruction both verbally and/or by suitable books. In the case I have in mind the fellow has read at least half-a-dozen fairly comprehensive books, and in spite of agreement with your views I am busy dissuading him from reading any more. He thinks he ought to get his fiancée also to delve deeply into the subject, but here again I was against it. The woman is the "passive" partner and though for successful marriage full co-operation is vital, is it not the duty (and privilege) of the husband to woo and teach his wife the art of love-making? Is not, therefore, a book such as Herbert Gray's *Men, Women and God* quite adequate for the woman?

Mr. CHARLES H. WELCH said: I am glad that Dr. Mace has spoken so highly of the moral code of sexual morality found in the Old Testament, and I feel that the following note may be of interest.

Recently I had occasion to investigate the usage of the Hebrew *chata* and its derivatives, translated "sin," and turned to the book of Genesis, feeling sure that there would be many and varied occurrences of this word. To my surprise I found that only one company are called "sinners" in that book, namely, "the men of Sodom," their sin being called "very grievous" (Gen. xii, 13; xviii, 20). Apart from rather general references such as the attitude

of Joseph's brethren, the possible consequences of the suretyship of Judah, and the offence of the baker who had been cast into prison; the two outstanding references to specific "sin" are limited to sexual transgression.

The first occurrence of the verb "to sin" does not occur until the twentieth chapter, and we have to wait until we arrive at the thirty-ninth chapter for the second occurrence. In Ch. xx we read that Abimelech had taken Sarah, Abraham's wife, and had been "withheld from sinning" by Divine intervention (Gen. xx, 6, 9). In the thirty-ninth chapter the word occurs in connection with Joseph and Potiphar's wife, a "great wickedness and sin against God" (Gen. xxxix, 9).

This is but one of many similar items which go to establish the doctrine of the "two seeds" ("Cain was of that Wicked one" for example), a subject too vast, however, for the present moment.

Dr. MACE replied briefly to the points which had been raised.

WRITTEN COMMUNICATION.

Mr. P. W. PETTER wrote: I have read this paper with much interest and am in complete agreement with it.

Religious restraint unfortunately is having less and less effect upon those who have turned away in unbelief of Divine revelation. Apart from this, the strongest argument, to my mind, ever put forward against promiscuity is that from Trade Unionism; something as follows:—

The, what I may call, "Union" price to be paid to a woman for sex-intercourse is care and maintenance for life. This of course is only tolerable where there is mutual love, but any less price is to pay less than the recognized "Union" price. And any woman who accepts less than this is what Trade Unions call a "Black Leg" and is doing herself a grave injustice, and what is even worse lowering the price and doing a great injury to her fellow women.

I recognize, of course, that sex-intercourse is not all that a man receives for care and maintenance for life. A good woman will return far more than the man can give. But sex-intercourse is the essential condition for which nothing less than care and maintenance for life is the proper payment.

874TH ORDINARY GENERAL MEETING

HELD AT 12, QUEEN ANNE'S GATE, WESTMINSTER, S.W.1, ON THE 2ND JUNE, 1947.

AIR COMMODORE P. J. WISEMAN, C.B.E., IN THE CHAIR.

The following elections have been made: Rev. J. W. Wenham, M.A., B.D., (on transfer from Member), Life Fellow; Rev. Roderick J. Wilson, M.A., Member; C. L. L. Binder, Esq., B.A., Member.

PRESIDENTIAL ADDRESS.

THE BIBLE AND CRITICISM.

By SIR FREDERIC G. KENYON, G.B.E., K.C.B., D.Litt., LL.D., F.B.A.

IN addressing you for the first time as your President at the Annual General Meeting of the Institute, I feel that my first obligation is to refer to the loss that we have suffered in the death of my predecessor, Sir Charles Marston. No one could have been more devoted than he to the principle set out as the third of the objects of the Institute, as stated in its prospectus: "In humble faith in one Eternal God, Who created all things good, to combat the unbelief now prevalent by directing attention to the evidences of the Divine care for man that are supplied by Science, History and Religion". In him this took the form especially of an ardent championship of the authority of the Bible. He was always on the look-out for evidence which seemed to him to confirm the accuracy of the Bible record; and he devoted much of his ample fortune to the search for such evidence by archaeological investigations, and the publication of their results both in scientific and in popular form. He took a general interest in archaeology, as was shown in his Presidency of the Shropshire Archaeological Society in the neighbourhood of his home at Wolverhampton; but Biblical Archaeology held the first place in his heart and mind, and in "Who's Who" he described himself, not only as "Manufacturer, Politician, and Traveller", but as "Biblical Archaeologist", and the list of his publications shows where

his main interests lay. Besides a book on "The Christian Faith and Industry" (a subject of very vital importance to-day) they include "The New Knowledge about the Old Testament" (1933): "New Bible Evidence" (1934); "The Bible is True" (1934); and "The Bible Comes Alive" (1937). The last-named was concerned with the results of the excavations at Lachish, which were financed jointly by Sir Henry Wellcome (and after his death by his Trustees), Sir Robert Mond and Sir Charles; and it is with these excavations and with those at Jericho, likewise promoted by him, that his name will be especially connected. He supported these researches liberally: he left the scholars who conducted them free in the planning of the works and the interpretation of their results; he accepted their results, and then whole-heartedly utilised them in impressing on the general public their value as confirming the accuracy of the Bible records. He claimed no expert knowledge as a scholar for himself; but he grasped eagerly at such results of scholarly research as seemed to him to strengthen the cause which he had at heart.

It is in the attitude taken towards the results of investigation, whether archaeological or literary, that differences are apt to show themselves among students of the Bible. Some seem always anxious to accept views which discredit the Bible as a correct record of events, or which throw doubts on the traditional authorship, date, and authenticity of the books of which it is composed. To them the non-traditional view is always to be preferred. Others take an exactly opposite standpoint, upholding both the authenticity and the accuracy of the Bible in the most rigid sense and treating all critics as enemies who must be resisted on all points. Others again try to find a *modus vivendi* between the results of research and criticism on the one hand and the Bible records as they have come down to us on the other. There was no doubt as to where Sir Charles stood. He was definitely on what would in present-day terminology be called the right wing of Biblical scholarship. He accepted without qualification, and indeed sometimes (in my opinion, over-emphasised, whatever seemed to "prove the Bible") and he tended to ignore or under-estimate evidence on which sceptical critics relied for their adverse views. As between what are called "fundamentalists" and those who are often inaccurately described as "higher critics" (a term which properly applies to all who occupy themselves with the interpretation, as opposed to the text, of the Bible, but often

restricted to the most "advanced" or left-wing of such scholars), there is no doubt that Sir Charles was nearer to the fundamentalist wing, because he held that the left-wing critics weakened the authority of the Bible, and consequently lessened its influence on the mind of the present generation. In this attitude I think he represented the views of many members of the Institute, and perhaps of the Institute as a whole.

Now I think I owe it to the members of the Institute to make clear my own position in this respect, just because I approach the question from a somewhat different angle from that of my predecessor. I was, indeed, very reluctant to accept appointment to the office to which you have elected me, and it was only under repeated pressure from your Council that I eventually consented. It is not that I differ in the very least from the fundamental proposition of Sir Charles and those who are like-minded with him, namely the authenticity, trustworthiness, and vital value of the Bible. These I affirm most strongly; I deplore anything that weakens the authority of the Bible; I regret the diminution, only too evident, in the practice of Bible reading; and I recognise that hostile left-wing criticism has largely been the cause of this. But I differ somewhat as to the way in which such criticism should be met; and in order that there shall be no misunderstanding I think it right to take this opportunity of stating my views as to Biblical criticism in general. If they are not acceptable to you, it would be much better that I should not be your President.

The difference is not one of principle, but of emphasis and of manner; and it is due to a mode of interpretation of the Bible which, as I hope to show, has not always been followed by the Church, and which is in no way vital to Christian belief. In the first place I would recall the first object of this Institute, as formulated at its first Annual General Meeting in 1867 and printed in our *Journal of Transactions* to-day. It runs as follows:

> "To investigate fully and impartially the most important questions of Philosophy and Science, but more especially those that bear upon the great truths revealed in Holy Scripture: with the view of reconciling any apparent discrepancies between Christianity and Science".

Science, I take it, in this declaration of purpose, includes historical science and literary science, as well as natural science:

and the object of the Institute is thus affirmed to be to show that the results of human intellectual inquiry are not incompatible with the divine revelation contained in the Bible and incorporated in the Christian faith. Now, if two parties are to be reconciled, the first stage is to see how far each can go towards meeting the views of the other without sacrificing its own principles, and whether there are indeed any irreconcilable differences between them. It is not wise to begin by treating the other side as an enemy bent upon one's destruction, or to disallow the validity of its claim to be listened to. In the present case, the first point to be settled is whether the human intellect is to be allowed free play in its examination of the Bible records, as it is in the investigation of natural science or of other ancient records. It is obviously a more hopeful beginning if one does not feel obliged to deny the validity of the other side's basis of operations.

Now, it cannot be denied that there was in the nineteenth century on the one hand a school which argued somewhat in this manner: The Bible is the Word of God; the Word of God cannot be otherwise than wholly true; therefore every statement in the Bible must be accepted as literally, wholly, and permanently true; and if the human intellect, following out its own inquiries, arrives at any different results, those results are inacceptable. Over against these assertions were set the results arrived at by natural science and historical and literary criticism, which only became active in this field in the course of the same century. There can be no doubt that these results were incompatible with the view of the Bible as above set out, and that the natural tendency of the human intellect to accept its own conclusions shook the credit of the absolutist interpretation of the Bible. The question therefore at once arises, Is the absolutist interpretation the only legitimate and Christian interpretation admissible, and must the conclusions of natural science and historical and literary criticism be disallowed as invalid?

The weak point in what I have called the absolutist interpretation is its claim to know exactly in what form God would choose to communicate His will to mankind. He might, no doubt, have revealed it in a form which would be open to no doubt, and which would be applicable to all states and all ages of mankind. To the human mind it is difficult to understand how this would be possible; how the primitive Hebrew or the

aborigines of Australia could have been addressed in the terms of the cosmogony of Copernicus or Newton or Einstein, or the moral teaching of Amos and Isaiah, of St. Paul and St. John: but it is not for us to say that it could not have been so. But it is clear, on the slightest consideration, that in fact He did not choose to do so; and it is easy to see why we should not expect it. It is clear that the Bible records have not reached us without some corruption in passing through human hands. There are in the first place variations, and not unimportant variations in the form in which they have reached different peoples. The Jew has them in the Massoretic Old Testament; the Greek Church in the Septuagint Old Testament, and a New Testament which is often not in accordance with the oldest MSS; the Roman Church in the Vulgate; the Abyssinian in the Ethiopic version; we ourselves both in our Authorised and in our Revised Version; and all of these are dependent upon hundreds of manuscripts, no two of which have an absolutely identical text. Which of these is the authoritative form of the Divine revelation? Next, in the substance of the revelation we see manifest evidence of variation, of progress, of adaptation to different stages of development. The revelation of Jehovah to Abraham, as the God of himself and his descendants, is not the same as the revelation of Him to the great prophets as the God of all peoples, claiming the allegiance of those who did not yet know Him, nor as the revelation of Him through Jesus Christ as the Redeemer and Saviour of the world, when the Law was supplemented by the Gospel.

The conclusion which we are entitled to draw from these considerations is that we are expected to use our human faculties in the interpretation of the record that has come down to us, and that we may expect to find human frailties in the transmission of the record, and a history of development in the revelation itself. And it is natural that it should be so. In the more important province of conduct, God has not imposed His will upon us. He has left us free agents, and lays upon us the responsibility of ascertaining His will, of interpreting it, and of following it. Why should it be otherwise with the interpretation of the books in which His revelation of Himself is recorded, which have come down to us through the agency of fallible men? We are in fact told as much by St. Paul: "For 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. But we have this knowledge in earthen vessels" (2 Cor., iv, 6, 7). That is the caution which we have to bear in mind.

If this be so, if we recognise the legitimacy of inquiry and criticism, we are plainly in a better position to deal with those who claim the freest right of criticism, and have a far better chance of bringing them over to our view than if we denied them the right of being heard at all. And it is my assured conviction that, by the acceptance of such liberty of criticism, not only are we able to treat critics as colleagues and not enemies, but that the authority of the Scriptures is strengthened, and we gain a fuller and richer understanding of their meaning.

There is nothing new or revolutionary in this point of view. It has not been held by everybody in comparatively recent times, but it is in accordance with the teaching of many of the ancient Fathers of the Church. There was in early times much difference of opinion as to the books constituting the Canon. The Jews drew up their Canon of the Old Testament about A.D. 100, excluding a number of books (those now constituting our Apocrypha) which had formerly circulated on an equal (or nearly equal) footing with the books which they accepted. The Greek Church continued to accept these, which had always been present in the Septuagint. The Roman Church, departing from the opinion of Jerome, included them in its authorised edition of the Vulgate. The Ethiopic Church includes them and adds to them the Books of Enoch and Jubilees. Our own Church, since the time of Coverdale, has followed Luther and Jerome in accepting the Jewish Canon, relegating the other books to the Apocrypha. The Syriac Church likewise originally omitted the Apocrypha, but subsequently incorporated them. In the New Testament the Syriac Church originally omitted Revelation, 2 Peter, Jude, and 2 and 3 John. All these books were in the time of Eusebius still regarded as of doubtful authenticity. Revelation was also omitted by the Egyptian Church. Hebrews was not regarded as Pauline in the Western Church, though it was in the Eastern.

That the text also was regarded as uncertain and open to discussion is shown very clearly by Origen's Hexapla edition of the Greek Old Testament, in which he tried to reconcile the Hebrew and the Septuagint texts. What is more important, however, is to note that differences of interpretation were also freely admitted. It was as clear to Origen as it is to us to-day

that there were customs represented as tolerated in the earlier books of the Old Testament which could not be reconciled with the morality of later ages. Chief among these were the polygamy of the patriarchs and the indiscriminate slaughter of defeated enemies, including women and children. It was the perception of these difficulties which led Origen both to affirm that Scripture has a different force for different ages and for different readers, and to propound the theory of multiple interpretations which might be applied to it. He maintained that every part of the Bible admitted of a threefold interpretation, literal, moral and allegorical. This doctrine had a most wide-reaching and disastrous effect on the exegesis of the Middle Ages. While the school of Antioch, under Theodore of Mopsuestia and Chrysostom, maintained the literal and common-sense interpretation of the Bible narrative, the principle of allegorical interpretation accepted by the great authority of Augustine flourished widely in the West, and led to extravagancies which often amounted to absurdities. The schoolmen of the Middle Ages added a fourth method of interpretation, which they called anagogic or mystical; and of all four methods the literal was regarded as of least importance. By one or other of the remaining methods any proposition which the writer wished to maintain could be justified. To quote a single instance, the word "water" might signify the simple element; but it might also signify sorrow or wisdom or heresies or prosperity; allegorically it might mean baptism or grace, and anagogically it might stand for eternal happiness.

It is thus plain that throughout the history of the Church a rigid literalism of interpretation has been by no means always prevalent or universally accepted. In this country we owe it to what in nearly every respect has been an unmixed benefit, namely the enthusiastic reception of the Bible which was one of the results of the Reformation. History tells us that when the Great Bible (the work of Tyndale and Coverdale) was placed by royal command in 1539 in every church, the common people flocked in crowds to read it. The Geneva Bible of 1560, in its smaller form and more readable type, brought it into the homes as well as the churches, and rooted it firmly in the hearts and on the lips of all classes. The allegorical interpretations were completely swept away, and the books of the Bible were read exactly for what they said. For the most part this was clean gain: but there was also an element of loss. Among the common

people, and especially among the strong Puritan party, there was no acquaintance with critical methods to replace the liberty of interpretation which had been used and misused in the Middle Ages. They treated every part of the Bible as of equal authority and of universal application. They had even a special preference for the Old Testament, and freely quoted the denunciations of the Midianites or the Amalekites as applicable to their own conflicts with their fellow-countrymen.

Less regrettable than such intolerant excesses as these, but equally uncritical, was the habit that established itself of applying Biblical texts wherever they seemed verbally applicable, and treating them as of universal applicability and authority, without reference to their original context. And this literal, uncritical interpretation and use of the Bible became so incorporated in the general method of approach to the Bible that any questioning of it was regarded as an attack on the Bible itself and a denial of its Divine inspiration and its authority as a guide in life.

It was this spirit which came into violent contact with modern developments in science and in critical scholarship. It is not always remembered how recent these developments have been. It was only in the nineteenth century that they struck heavily on the accepted views which had become traditional. The average Englishmen had been content to read his Bible (and he *did* read it) with unquestioning acceptance, and had indeed little means of comparing it or criticising it. It was therefore a shock when geological discoveries were found to be inconsistent with the literal understanding of the seven days of Creation, and with the chronology of Archbishop Usher which had been imbedded in the margins of our Authorised Version so long that it was almost received as part of the sacred text. Literary criticism also, such as scholars had developed in connection with classical texts, when applied to the books of the Bible, suggested hitherto unknown modifications in accepted views as to the dates and methods of composition of these books. The growth of our knowledge also of the ancient world raised questions which bore upon the history of the Hebrews as recorded in the Old Testament. It therefore became necessary fairly to face the question whether the conclusions arrived at by human intelligence could or could not be accommodated to an interpretation of the Bible record which a Christian could without disloyalty accept.

This is precisely the issue which the Victoria Institute was founded to investigate: not to uphold one particular theory of Bible interpretation, but, in the words which I have quoted already, to seek to reconcile any apparent discrepancies between Christianity and Science. What I have endeavoured so far is to show that the Church throughout its history has not confined itself to any one method of interpretation, but has tried many ways to fathom the depths of the teaching inscribed in the Scriptures. Personally, I believe that this can best be achieved by keeping an open mind with regard to the results of criticism: that it shows a truer faith in God to use to the full those intellectual faculties which He has bestowed upon us, and to believe that they cannot ultimately lead to conclusions irreconcilable with the truths of revelation. It would be dishonouring to God to suppose that the faculties He has given us inevitably lead to false conclusions.

This is not by any means to say that all the assertions made by those who regard themselves as advanced exponents of scientific or literary criticism are to be accepted forthwith as assured truth. I would no more accept the assertions of Baur and the Tübingen school with regard to the dates and character of the New Testament books than I would the most extravagant allegorical exegesis of the Middle Ages. What I would urge is that science must be met by science, criticism by criticism, and that this can be done in sure faith that in the long run the truth will be found to lie on the side of Christian belief. It is not to be denied that this has not always appeared to be so: that plausible arguments have from time to time been produced which, if substantiated, would shake the authority of the Bible; but it is to be remembered that this is a world of trial and probation, and that our true course is to go forward with unshaken faith to investigate and challenge inacceptable conclusions.

Those who feel any doubt as to the validity of such confidence may well draw encouragement from the course of historical and scientific research during the past century. It cannot be denied that in the beginning of what may be called the age of criticism some very formidable assaults were made on the authority of the Bible. It was hard to reconcile modern cosmogonical and geological conclusions with the narrative of Genesis—impossible, indeed, to do so in any form which would

be accepted by the scientist. The Darwinian doctrine of evolution removed creative activity very far away and gravely reduced the action of Divine Providence in the world: and Science was then very sure of itself and of its power to solve all problems. Historical inquiry, with much new evidence derived from the records of the surrounding nations, made many people doubtful of the trustworthiness of the historical books of the Old Testament; and literary criticism, arguing that there was no evidence of the use of writing before about the eighth century B.C., maintained that no confidence could be felt in the detailed accounts in the books of the Octateuch of events many centuries earlier, and of laws and customs far too elaborate to be attributed to so primitive a people.

To meet such arguments, faith and perseverance in research were needed: and they have been abundantly justified. The cocksureness of Science has suffered rude shocks. Scientists have found many gaps and uncertainties in what seemed the smooth and easy fabric of Evolution. Archaeology has proved that writing was known and freely used long before the age of Moses, and that codes of legislation at least as elaborate as his were current as early or earlier among adjoining nations. Literary discoveries have established the first-century date of the books of the New Testament, and have satisfied scholars in general of the truth of their traditional assignment to their respective authors. In every respect the authority of the Bible, from the most severely scientific point of view, stands higher to-day than it did a century ago. The faith of those who believed in the face of difficulties has been vindicated.

I feel therefore that we who believe in the Bible have everything to gain by meeting hostile criticism on its own ground: by not treating it, indeed, as necessarily hostile but as legitimately raising questions which require investigation. And we shall do well, I am sure, not to overstate our case or to use arguments which will not stand examination. That has, I think, been a rather common error among champions of the Bible. To give a small illustration of what I mean: I remember many years ago dissuading Bishop Winnington Ingram, then head of the Oxford House in Bethnal Green, from using the argument that the story of the destruction of Pharaoh and his army in the Red Sea was proved by the fact that no mummy of the Pharaoh Meneptah had been found: first, because there was no certainty that Meneptah was the Pharaoh of the Exodus; next, because

the book of Exodus does not say that Pharaoh was himself drowned; thirdly, because his mummy might still turn up; and, finally, because it would prove nothing whether it did or didn't, since if he were drowned his body would probably be washed ashore. So also, to revert to the discoveries for which our late President was largely responsible, I do not think the Lachish letters contribute anything to the confirmation of the Bible. They are interesting, as a sidelight on the last years of the Kingdom of Judah and as mentioning individuals known to us by name in the Bible record; but they have to be explained from the books of Kings and Jeremiah more than they serve to explain them. On the other hand, the Jericho excavations, if rightly interpreted by Prof. Garstang, give valuable confirmation to what have been thought questionable details in the book of Joshua; and the Ras Shamra discoveries, so far from showing, as some people hastily claimed, that the religion of the Hebrews was similar to that of the Canaanites, prove, it seems to me, exactly the contrary. They are extremely valuable as showing what was that religion of Baal which the worshippers of Jehovah were combating throughout the history of the kingdoms of Israel and Judah, but in doing so they prove the immeasurable superiority of the latter creed.

It is not my purpose to-day to review all the results of modern archaeology and criticism, but to claim, as consistent with full loyalty to Christianity and with the principles which the Victoria Institute was founded to assert, a method of interpretation which regards the Bible as a *progressive* revelation of God's education of His people, developing and expanding from primitive legends through the training of the Patriarchs and Judges, on to the grander and more spiritual conceptions of the Prophets, and culminating in the revelation of Jesus Christ through His disciples and Evangelists; not immune from human frailties in the transmission of the record, but preserved by His Spirit from error in the essence of what the record enshrines, the revelation of the nature and will of God. Not all persons will interpret the record in the same way. The freedom which one claims he must allow to another. One man may believe that the book of Daniel is a contemporary record of actual fact, another that it is a second-century composition of tradition, romance and history disguised as prophecy; but each may recognise the sincerity of the other and be prepared to consider his arguments with good temper and without contempt.

Liberty of investigation, an open mind, charity towards our opponents, and faith in the victory of truth: these are the principles I claim as the true spirit of the Victoria Institute. With them I believe we may go forward and "greet the unseen with a cheer".

Discussion.

The Chairman (Air Commodore Wiseman) said: I am sure that you wish me, on your behalf, to voice your thanks to Sir Frederic Kenyon on this the occasion of the delivery of his first Address as President of the Institute. His papers as Vice-President have enriched our Transactions. As you are aware it has been a tradition of the Victoria Institute that the Presidential Address is not normally subjected to discussion as are other papers read before it. The Chairman of the meeting is, however, expected to make some observations.

In the paper to which we have just listened our President has shown himself a true critic in the exact meaning of the word, that is he has acted as a judge, placing the evidence in the scales with absolute impartiality. The careful restraint, the sober judgment are, of course, in accordance with the immense learning which has characterised his work over so long a period, particularly in connection with textual criticism. He has wisely called our attention to the primary purpose for which our Institute was brought into existence. As stated in our Constitution we are not called upon to assume an attitude, but to investigate "fully and impartially" and I trust that we will heed his reminder of this postulate. I am very sure that the only way that we can meet one-sided and merely destructive criticism is by a more balanced and constructive criticism certainly not by mere denunciation, still less by vituperation.

Sir Frederic has referred to the tendency on the part of some to use arguments which will not bear examination, so cannot help our case. He instanced the desire of Bishop Winnington Ingram to use the proposition that because the mummy of Meneptah had not been found it was evidence of the destruction of the Egyptians in the Red Sea. Only recently the Victoria Institute received a letter from a venerable Archdeacon asking whether we had any information about a story which had been broadcast to the effect that Noah's

Ark had been discovered in an almost complete condition on a lake near the summit of Mount Ararat. Because the repetition of that story in the form given would have done great disservice to the cause of truth, I informed our correspondent of some of the obvious errors in the story. This is not the place or the time to go into these in detail. We can never serve the cause of truth except by truth. That this type of misjudgment is not confined to one side has been clearly shown by our President when he pointed out that the alacrity with which some scholars claimed the Ras Shamra discoveries as revealing a strong similarity between Hebrew and Canaanite beliefs. As Sir Frederic has stated, they prove "exactly the contrary."

Our President's pre-eminence in the field of Textual Criticism and his distinguished contributions in the field of archæological knowledge lends impressive weight to his pronouncement in this Address: "In every respect the authority of the Bible, from the most severely scientific point of view, stands higher to-day than it did a century ago."