knowledge which consisted in the worship of and humiliation before intermediary beings, as angels, but had no power over the flesh with its appetites and lusts, St. Paul warns the Colossians. And in warning them he uses the very words of the man who had been initiated in the Mysteries. He speaks of 'entering on' or 'taking his stand on' what one had 'seen' (in the Mysteries). The whole passage, says Sir W. M. RAMSAY, consists of three connected and parallel warnings.

The first warning is in the eighth verse: 'See that there shall be no one who takes you captive by philosophy and empty illusion after the tradition of men, after the elemental powers or rulers of the world, and not after Christ.' After this warning there is a statement of the triumphant supremacy of Christ, the Head, over those elemental powers.

Then follows the second warning. It is found in the sixteenth and seventeenth verses: 'Let no one, then, make himself a judge [or critic] of you in meat or drink, or in respect of festival days: which are a shadow of things future, but the body [that casts the shadow] is Christ's.' After which in the eighteenth verse comes the warning against the man of the mysteries with his false worship and fleshly mind. Sir W. M. RAMSAY translates the verse in this way: 'Let no one cozen you of the prize of your life-race, finding satisfaction in self-humiliation and worshipping of angels, "taking his stand on" (ἐμβατεύων, a mystery word) what he has seen [in the Mysteries], vainly puffed up by his unspiritual mind, and not keeping firm hold on [Christ] the Head.'

'The language of Paul throughout the whole passage shows not only disapproval and condemnation of this mystic theosophy, but also a certain tone of scorn, or at least of lofty and absolute superiority. The man who could think and write in this strain moves on a plane of thought infinitely above the level of that philosophy, or (perhaps one should rather say) pseudo-philosophy. Both taught the way of salvation, or simply 'the way' (Ac $19^{9.23}$, etc.); but in the Mysteries the way was a literal path marked by a white poplar tree and other signs, which the soul learned through the esoteric and mystic lore, whereas in the gospel it was an idea, making itself into a driving force in the conduct of life; it was the intense, overpowering belief in a spiritual fact.'

The Biological Control of Life.[1]

BY J. ARTHUR THOMSON, M.A., LL.D., REGIUS PROFESSOR OF NATURAL HISTORY IN THE UNIVERSITY OF ABERDEEN.

THE idea of the biological control of life has probably been always—more or less clearly—in the minds of physicians and hygienists, but the focussing of it is distinctly modern. We may date it, in fact, from the work of Darwin and Pasteur.

Darwin changed a relatively static conception of the world of organisms into an intensely dynamic one, making the Evolution-idea current intellectual coin. The forms of life which seemed so stable were shown to be in racial flux—though the change might be as imperceptible as a glacier's movement. The *individual*, moreover, was shown to be modifiable or plastic under the influence of environment and function. Thus the whole aspect of things was changed. The outlook became kinetic, and this led on naturally to the practical idea of *the controllability of life*. If flowers and pigeons and the like can be controlled, and controlled so well, then why not human life also? If Man can evolve from out of a wolf the domesticated dog, the dependable guardian of the flocks, may he not hopefully try to evolve the wolfish out of himself?

[1] An Address delivered at the opening of the School for Christian Workers, Aberdeen, 14th October 1913.

But it was Pasteur who made the idea glow. He stands foremost among those who have been inspired to great achievements by the idea of the biological control of life. Beginning with the silkworm disease which was ruining the south of France, he advanced with sure step to such terrible maladies as splenic fever and hydrophobia, conquering by understanding. With object-lessons on a grand scale he convinced all the thoughtful that the days of folded hands and resignation were over, and that it was for Man, with Science as torch, to enter bravely into the fuller possession of his kingdom.

The Three Fates.

Among the influences that count in the shaping of a life, the biological factors are certainly fundamental, and it is no 'biologism' to confine our attention to these. To give prominence to one set of factors should not be taken to imply any lack of appreciation of others. Our business, *here and now*, is with the biological 'Fates.'

The first Fate is *Heredity*—to wit, the relation of organic continuity between successive generations. This relation, which is maintained by visible germ-cells, determines the inheritance—all that the living creature is or has to start with in virtue of its hereditary relation. In the strict sense the organism is, to begin with, inseparable from its inheritance, *is* at first the inheritance. When the bundle of gifts from ancestors forms a new unity in the fertilized egg-cell, *there* is already the organism *in potentiâ*.

'Bless not thyself,' said Sir Thomas Browne, 'that thou wert born in Athens; but, among thy multiplied acknowledgments, lift up one hand to heaven that thou wert born of honest parents, that modesty, humility, and veracity lay in the same egg, and came into the world with thee.' 'A man,' as Heine said, 'should be very careful in the selection of his parents,' for Heredity, the past living on in the present, is the first Fate,—and the greatest of the three.

The second Fate is *Environment*—all manner of surrounding influences that play upon the living creature and that the living creature plays with. Some make deep dints—the tempests and famines of life; some give light touches—the sunshine and the rain. Space and food, air and light, scenery and art, home and school, and much more are included in the idea of environment in the widest and most scientific sense. Environment is the second Fate, and it comes a better second than many people think.

The third Fate is *Function*—what the creature does or does not do, the influence of use and disuse, of work and play, of exercise and rest. When we consult a book like Arlidge's *Diseases of Occupations*—a grim curiosity for future ages—we realize what an important factor function is for evil as well as good in human life. 'By force of striking,' the French saying is, 'one becomes a blacksmith'; and there is an equally true saying in *Faust*: 'What you have inherited from your ancestors, use it if you would make it really your own.' In the language of the immortal parable, we must trade with our talents.

Before we leave the metaphor of the Three Fates, let us ask if there may not be *four*. We know that a swallow born and bred in Britain flies south at the end of summer 'to warmer lands and coasts that keep the sun,' probably to West Africa; and the Aberdeen University Bird Migration Inquiry has helped to prove that such a swallow may return in the following spring to the farm-steading where it was born, thus illustrating a wonderful constitutional homesickness. That it can make the double journey successfully is partly, perhaps mainly, due to its inheritance—it has a brain legacy predisposing it to successful migration. It is also in part due to its functioning, to its early discipline in flight. It is also in part due to its environment, *e.g.* to the nutrition which gives it strength to fly, and to the environmental stimuli which pull the trigger of its migratory instinct. But is there not something else—a fourth Fate, of a more shadowy kind? We mean the cosmic factor, which is quite uncontrollable by the creature itself, which offers or withholds opportunities. We mean, in the case of the swallow, the inexorable trend of things which does not seem to care for individual migrants, which meets some with a fatal storm and offers others a fair haven. It is difficult to deny that one of the factors in our own life is a giving or withholding of opportunities, which we at any rate have nothing to do with.

The Heredity Factor.

Returning now, let us consider each of the three factors in turn, beginning with heredity. It seems almost a contradiction in terms to speak of heredity

in a lecture on 'The Control of Life.' Is there anything *less* under our control than our inheritance? Have we not to take what we get and be thankful? The study of heredity is apt, of a truth, to leave one fatalistic; the inexorableness of hereditary persistence is often awesome. Our start in life is no haphazard affair, but rigorously determined by our parents and ancestry. Besides the general race-characters, all sorts of peculiarities, trivial and important, normal and abnormal, bodily and mental, and, especially, well-defined, crisply marked 'unit characters' reappear and reappear —generation after generation, sometimes for centuries. The hand of the past presses heavily.

There are three notes that the biologist must make on the fatalism of heredity. The first is that the hereditary relation works both ways. It may handicap us with ancestral weaknesses, but it also secures to us the entail of a big common stock of wholesome human qualities. We may not be pleased with the shape of our ear, but let us be thankful that it is a *human* ear. We may not be so controlled and gentle as we should like to be, but the ape and the tiger have died down considerably. The hereditary relation secures the transmission not only of serious handicaps and taints, but also of the big gains of the past (which seem always, strange to say, to have been made *not by the individual, but by the germ-plasm*). The results of individual blows and buffetings, of individual thrift and savings, of personal wear and tear, do not seem to get into the racial treasure-box, whose unpacking is called development.

The second thing which mitigates the fatalism of heredity is the fact of variability. Like only *tends* to beget like. There is racial inertia, but there is an equally deep tendency to divergence. For there is always in some measure a rearrangement of qualities at the beginning of every new life; we might say a recrystallization, if the word did not suggest (quite erroneously, as recent discoveries have shown) something too static. The fact is that the germ has an inherent creativeness; it makes experiments in self-expression; the results are the most precious things in the world, what are called variations, mutations, new departures, idiosyncrasies, eccentricities, individualities, originalities. When they are out of harmony with the rest of the creature, they are called freaks or cranks; when they are ahead of the race, they are called genius. In their finest human expression they mean reachings forward towards Superman.

While we do not know the recipe for genius, and cannot give a prescription to induce originality, we have from the experimental side the suggestion that decisive changes in 'nurture' seem to stimulate germinal creativeness. And of this we are quite certain—that, given a promising new departure, we may fail to make anything like the best of it if the nurture is not likewise evolving. Good nurture gives a progressive variation more chance of realization, success, and transmission. What a pitiful waste it is when a fascinating new plant is choked in a sluggard's garden!

The third point against the depressing fatalism of heredity is that the natural inheritance always requires a definite nurture if it is to develop. There is a minimum nurture without which it will not develop at all; there is an optimum nurture with which it will develop to the full; between these two extremes there are all grades. The seeds sown in the garden were good enough, but it was too far North for them, they did not even germinate; the seeds of another kind grew into miserable shrivelled plants; the seeds of another did 'fairly well'; the seeds of a fourth found the nurture congenial and stimulating, and developed into splendid plants which delighted the gardener's heart. Now we have nurture under control, and this is 'the other side of heredity.'

Development is the expression of the hereditary nature—the opening of the buds, the cashing of the legacy, the making visible of the implicit—call it what you will, it is a unique process. The great commonplace which we are emphasizing is that the components of our hereditary 'nature' require appropriate 'nurture' if they are to develop, and *this nurture is largely under our control.* Admirable qualities in the inheritance may never be realized, because the nurture is insufficient or inappropriate. We shake our heads reflectively in such cases, and say: 'He never got his chance, there was more in him than people thought.' The nurture was inadequate.

And, of course, there is the other side to it—that undesirable qualities in our inheritance may also be inhibited in development. Some of us must confess with the poet that we are 'stuccoed all over with Quadrupeds,' including some Reptiles. But happily these may remain largely unexpressed if we refuse them the appropriate

nurture. And this is part of the Control of Life.

Thus, to recapitulate, we have to counteract the fatalistic impression which careful study of the facts of heredity engenders, by recognizing (1) that along with defects of will and vices of blood we inherit a share—more or less generous—of the wholesome human qualities; (2) that like only *tends* to beget like, for each new life is in some measure a new beginning, a forgiveness and a fresh start; and (3) that while our inheritance is outwith our control, the expression of the inheritance in development is dependent on the nurtural conditions, which are within control.

It must also be pointed out that while we cannot choose our *parents*, we can more or less choose our *partners* in life. And this is controlling heredity. We have also, as parents, a great responsibility in regard to the partners whom our children may choose. The days of maidens shut up in fortresses are past, but there is no coercion in the effective garrisoning of the affections against the attacks of the ignoble and unworthy. And this again means controlling heredity. The inheritance from the past—often tragically remote—is beyond control, except in so far as it can be, to some extent, furthered or hindered in its expression by a control of 'nurture'; but the inheritance transmitted to the future is in some measure within control, since the mating of fittest with fittest, of fit with fitter, and of fit with fit can be encouraged, while the mating of fit with unfit, and of unfit with unfit, can be discouraged.

The Environment Factor.

The living creature, especially when young, moves over a succession of anvils on which different hammers play — mechanical, chemical, physical, and even animate. Environment includes space, food, air, light, weather, climate, and more besides, and every one knows how it grips life. 'There was a child went forth every day,' Whitman tells us, 'and whatever that child saw became part of him for a day, or for a year, or for stretching cycles of years.' 'As is the world on the banks, so is the mind of man.' The environment factor is powerful, and it is controllable.

It is important to understand that the relation between organism and environment is manifold and complex—far more intricate and subtle than is usually supposed. We cannot attempt an analysis here, but it may be pointed out that the organism depends upon its environment for continuance and for proper development; that the environment pulls the trigger of the organism's possibilities; that the organism suffers dints—some shallow, some deep—from its environment; that the organism thrusts as well as parries; and that some environmental influences go so deep that they affect the offspring.

It is important both for clear thinking and sound action to have a firm, not a flabby grip of the relation between organism and environment. False simplicity always leads us astray. To take an illustration: Some people write down all the deteriorative characters of slum-dwellers to the bad housing, as if it were a simple matter of cause and effect. No biologically trained mind can accept this view; all these relations are complicated. Let us think of it for a moment. There is often to start with types of low mentality and vitality; they get forced into unhealthy trades; they acquire occupational depression; they form the habit of taking the usual shortest way out of Slumdom; they get all wrong with their diet; the mothers have to go out to work at low wages; the children are neglected; the force of social suggestion is strong against them; the marriages are often casual; there is often much inbreeding; all sorts of arrears accumulate—physical, physiological, and moral—and finally the dwellers in darkness lose heart altogether.

And as it will not do to say that the slums produce the slum type, so it will not do to say that the hereditarily slummy types make the slums. The truth is a combination of these and other partial truths. We cannot simply say that the peculiarities of deep-sea animals are directly due to the strange conditions of the deep sea, nor that pre-adapted animals sought out the refuge of the great abysses. The biological truth is a combination of these two positions. An inferior type gravitates to the slums, and the slums make their badness worse. Yet in spite of the encrustation of deteriorative modifications on the parents, and the arrested development of many of the children, some of the latter do excellently well under new conditions, like plants shifted to a good garden. This lends hopefulness to the control and the obliteration of the slums and their influence. In illustration let us cite the general result of an

inquiry conducted in Birmingham by Miss Mary Horner Thomson [1]—an admirable piece of work which should be multiplied throughout Britain. Miss Thomson studied the records of 265 children, mostly of 'the lowest class' (Class A, fourth below the poverty level), who had been sent to institutions and trained. She found that 192 (72 per cent.) turned out well; that 44 (16 per cent.) were doubtful; and that only 29 (less than 11 per cent.) were unsatisfactory, and of these 13 were defectives. These figures afford eloquent evidence of the controllability of life.

The Function Factor.

What we have said in regard to the influence of surroundings applies also to the influence of function. Without appropriate activity the organism cannot develop aright. Unnatural activities lead to structural evils. There are well-known occupational diseases and malformations. Through lack of exercise an organism often drifts into degeneration. The training of animals sometimes has very remarkable success. In education we make pathways in the brain along which thoughts can travel quickly. Habit becomes a second nature. There is no need to emphasize the general importance of function as a factor in life. And it is controllable.

Lead-poisoning may be taken as an instance of the injurious influence of dangerous function. It used to wreck the health and shorten the life of the mothers, killing one unborn child after another. It used to result in weakly, rickety, epileptic, short-lived offspring, in dwarfed infantile survivors—men of 21 looking like boys of 14—and so on, in horrors that make us all ashamed, for we are all involved willy-nilly. Now the instructive fact is that, thanks to men like Sir Thomas Oliver, the pernicious wastage has been in great measure brought under control. With the abolition of female labour in white lead factories, with improvements of conditions, with various *nurtural* changes, the terrible state of affairs to which people submitted with pathetic depression on the one hand, and callous lack of initiative on the other, has been greatly alleviated. Moreover, it seems to be the case that, in spite of the dreadful loss of life and *individual* damage, the *racial* effects are relatively slight.

[1] *Environment and Efficiency: Birmingham Studies in Social Economics.* Longmans, Green & Co., 1912.

Our point is the general one that, while our inheritance is beyond our control, what we make of it is largely within our control, for environment and function are both very controllable. We can even get more out than is put in, enriching ourselves by trading with Time.

Acquired Characters.

The changes wrought out in an individual organism as the result of *peculiarities* in environment or in function are called somatic modifications, or individually acquired characters; and most people are now aware that it is very difficult to find convincing evidence that these are ever handed on as such. If this be so, it is probably just as well, since many of them are on the wrong side of the account. Those that are useful can be reimpressed on each successive generation, and those that are prejudicial may perhaps be avoided. Thus the ameliorative control of function and environment are of incalculable importance, though individual modifications may not be transmissible as such or even in any representative degree.

While the facts at present known point strongly to the conclusion that particular gains and losses do not affect the main inheritance—what we may call the racial treasure-box—there is a rapidly increasing body of evidence which goes to show that deeply-saturating influences—long persisting—such as bad food and racial poisons, may gradually get at the physical basis of inheritance, and corrupt it. Perhaps sunshine and fresh air, on the other side, may gradually enrich it.

Criticism of Consumption.

In the control and amelioration of function much has been done in recent years, sometimes by employers, sometimes by the State. But much remains to be done, and it is always profitable to recall that there is a powerful instrument of progress within the grasp of every one—what economists call the criticism of consumption. That is to say, we can refrain from buying what we know to involve very prejudicial occupation, and we can give a preference in our expenditure to those products and to that kind of work which we know to be wholesome, or more wholesome than some other. If this is done persistently and consistently by sufficient numbers it inevitably makes for the control or disappearance of injurious occupations.

Selection.

Every one knows that Nature is always sifting, and we call this Natural Selection. More are born than can survive; the environment is changeful and callous; living creatures are in essence self-assertive, insurgent, and ambitious; for these and other reasons we have the struggle of existence in its manifold guise, and quick or slow elimination is always going on. When the elimination is discriminate we call it Natural Selection. The possessors of certain advantageous qualities survive longer than those who do not have them, and have larger families. Thus the relatively fitter survive,—fitter, that is to say, in reference to particular conditions of life. For the tapeworm is just as well adapted to its inglorious lot as the lark at heaven's gate. Let us take an illustration.

With silk threads Cesnola tethered 45 green praying mantises to green herbage, and 65 of the brown variety to withered plants. All survived for seventeen days, unnoticed by birds. But when he put 25 green ones among brown herbage all were killed by birds within eleven days, and of 45 brown ones placed on green leaves, only 10 survived at the end of seventeen days. In an evergreen country the green variety would become the surviving type; in a brown country the brown variety would survive. Not that one is better than the other, it is simply relatively fitter to the given conditions.

Such is Natural Selection, and in early days mankind was much in its sieve. Competition with wild beasts, changes of climate, scarcity of food, unchecked disease, and so on, sifted him, and we are the better of the sifting to-day. But, as every one knows, the whole trend of human evolution since civilization began has been to throw off the yoke of natural selection. There is still some of it left, as statisticians have proved, but the old thraldom has gone. We cannot return to the Natural Selection régime even if we would. It is in us to try to save life—when we get keenly enough interested at any rate. Let us take two or three instances of this control of eliminative processes. A hundred years ago people shuddered at the name of 'gaol-fever,' a terrible pestilence, which attacked judge and jury, prisoner and spectator at Old Bailey. We call it typhus fever now, but it is rare in England, thanks to the enthusiasm of the early nineteenth-century hygienists. It is a dirt disease, it can be controlled by cleanliness and sulphur. It is due to a microbe, not yet isolated, which is transferred from man to man by infected lice. As Sir Ray Lankester says, the so-called Angel of Death was the clothes' louse. We cannot but feel that it was almost contemptible to have submitted for centuries to this tyranny of dirt, but we are continuing to submit to similar things. We are slow to learn the lesson of the Control of Life.

But some progress is always being made. When a member of a household of fifty years ago was pronounced by the physician to have fallen into consumption, did they not practically shut the windows and open the grave, folding the hands in fatalistic resignation? Now, however, the ravages of this terrible scourge are being brought under some measure of control, and we know that if it is tackled early enough it may be eminently curable.

We have already referred to Pasteur's object-lessons, and our thoughts pass from him to Lister and Koch, and to their successors in the sublime task of the control of disease. We think of malaria and Malta fever, of diphtheria and plague, all coming under control. It is interesting to notice how many of these triumphs of control illustrate Darwin's central conception of 'the web of life,' for malaria is wrapped up in the bundle of life with the mosquito, and plague microbes with rats and their fleas, and sleeping sickness with Tse-tse flies and the big game whose blood these suck.

What a fine instance, on another line of work, is the thyroid gland treatment. That small paired body which was originally a nutritive gutter on the floor of the pharynx has been transformed in the course of evolution into a blood-gland, an organ of internal secretion, and to it has been handed over one of the keys of bodily and mental health. If it goes wrong there is goitre and cretinism. And the point illustrating our theme is the well-known one that great alleviation and provisional cure can be effected by injecting into the patient an extract prepared from the thyroids of domestic animals, or even by giving him their thyroids to eat. The ancients advised the coward to eat of the heart of a lion; on a higher turn of the spiral we control cretinism by a similar prescription.

Changes of Outlook.

Time brings interesting changes! Speaking of cockchafer-beetles and the famines which their ravages sometimes brought about in bygone days, Professor Giard recalls the fact that it was the spiritual, not the scientific, authorities who used to deal with them. 'In 1479 they were summoned before the ecclesiastical tribunal of Lausanne and defended by an advocate from Fribourg. After deliberation, they were banished from the territory. *O tempora!*' In this we have a sort of diagrammatic, and therefore extreme, illustration of ancient methods, in which the control of life was attempted but not along the lines of Science.

Another phase, still extant a few years ago, may be illustrated by reference to locust plagues in South Africa. The critical moment in dealing with these voracious insects, which find a countryside a garden and leave it in a short time a desert, is while they are still foot passengers and wingless. They travel in great armies, but with concerted action they can be destroyed in millions. Thus the crops may be saved and the multiplication of the locust race checked. Everything depends, however, on concerted action, on sending word of the approach of an army, and on forming a cordon to stop the march. Now only a few years ago quite a number of religious and worthy Boer farmers—unconsciously impious—refused to join in with the Anti-Locust League, giving for their reason that it was attempting to stay the hand of God!

As we have been trying to illustrate, we have now entered upon a very different phase, in which the scientific control of life is recognized as an obligatory responsibility. In face of what is evil it is one of the means which we *must* use. Not in regard to disease alone, but in regard to depressing environment, ugliness, and dirt; in regard to dangerous and deteriorative occupations; in regard to poverty and unemployment, and, in short, all manner of objective evils, we have a determination—rapidly growing stronger in our midst—to get at the facts, to understand the operative factors, and to put brains into the task of betterment. Knowledge is foresight, and foresight is power. Science is for the amelioration and control, as well as for the enlightenment of life. To have this conviction strongly is surely to show no profane depreciation of the things of the spirit which are outwith the scientific universe of discourse.

Cautions in Conclusion.

There is satisfaction in healing the sick and preventing wastage of life, but there is no gainsaying the danger of being cruel to future generations by being kind in the present. There is a risk of helping too much, of coddling the undesirable and unwholesome so that they get strength enough to multiply. There is the tragedy of spoiling good stock by permitting the infiltration of bad. This is a large and difficult question, but we may be allowed to say three things. (1) In a number of cases the diseases with which man is successfully coping are *indiscriminate* in their elimination. They thin the ranks, but there is no 'singling.' The checking of such diseases will not, therefore, encourage the survival of the unfit. (2) In the present state of social sentiment and scientific knowledge there can be no question of social surgery or of accepting Plato's proposals for the purgation of the community. But what can be done is to work back to the old and wholesome idea of pride of race, and to work away from anything that tends to encourage the multiplication of the diseased and the unwholesome. (3) The commonplace must be borne in mind that man is a very complex being and not to be ticketed like a homogeneous commodity. Many of those who are seriously handicapped by inheritance, and who ought not to be encouraged to have offspring, are in other respects very valuable citizens. The social surgeon speaks in a high and mighty way about weaklings, and no one can wish that they should multiply, but the use of the term requires discrimination. Many who have been weak in body have been strong in spirit, and have played a great part in history. As poets and artists, reformers and preachers, many weaklings have been among the 'makers and shakers' of the world.

In scores of different ways men and women of goodwill are working towards the increased healthfulness of the body politic, and it is surely very seldom that any piece of sound work misses of its fruition. But if results are to be lasting, and if they are to be commensurate with the energy expended, there must be more concert in action. There is need for more strategy. Thus, *keeping to biological progress*, as we have done throughout, knowing well that there are others, it is plain that

there must be a correlation of at least three kinds of endeavour—that which aims at the improvement of the organism or breed (Eugenics), that which concerns itself with the amelioration of the environment (Eutopias or Euthenics), and that which takes to do with the betterment of functions, especially occupations (Eutechnics).

The inheritance is the seed-corn; 'nurture' in the widest sense is the soil and the sunshine, the wind and the rain. Nurture can create nothing, but without it nothing can develop aright. We cannot make a silk purse out of a sow's ear, but we may trade with our talent so that it become five, or perhaps even ten talents.

The Great Text Commentary.

THE GREAT TEXTS OF ROMANS.

ROMANS XI. 33.

O the depth of the riches both of the wisdom and the knowledge of God! how unsearchable are his judgements, and his ways past tracing out!

1. In these words the Apostle, carried along by the force of the survey which he has been taking of God's purposes and manifestations of grace, expresses the adoration, both confident and joyful, which it awakened. It was not some single aspect of the subject, not even one of the great conclusions to which it led, that produced this exaltation of spirit, but rather the total impression made upon him as he reviewed the manifold wisdom of God in creation, providence, and grace.

2. There is an intensely modern note in the passage. It shows the workings of a mind which felt as we do 'the burden of the mystery of all this unintelligible world,' and yet found rest in the intuitions of faith. That is a characteristic of the sacred writers. The Bible is never aloof from the conflicts of man's soul; never delivers its revelations as occult oracles which demand a blind acceptance. As it spoke to men in ancient time by living words which found an echo in their hearts, so in its later unfoldings of God's will it keeps itself in close touch with man's spirit, and, as in our text, is adapted to the movements of thought and the new problems which face us to-day. And when in the centuries to come science shall have made surprising discoveries far in advance of anything now attained, and the developments of Providence in the history of mankind shall have introduced new wonders in God's ways, the old words of the Bible will have lost none of their significance, but will only have received fresh and more forcible illustration: 'O the depth of the riches both of the wisdom and the knowledge of God! how unsearchable are his judgements, and his ways past tracing out!'

I.

THE RICHES OF GOD'S GRACE AND WISDOM.

The Apostle has already expounded God's plan and method of grace, and has traced its working in the call of Abraham, and the opening of the door to the Gentiles. It is the greatness of the grace and wisdom revealed in the Divine dispensations that now fills his mind. But expression fails him; for words are always too poor to convey our deeper thoughts and emotions; there is in them an incommunicable element which baffles all our efforts at uttering it. We are obliged to fall back upon imagery, using the things of earth and sky as symbols of the ineffable and unseen.

1. The riches of God's grace and wisdom are seen in *the obstacles which had to be overcome in effecting man's redemption.* These obstacles are only partly known to us. Some are hinted at in Scripture, but nowhere fully unfolded. It is only by the use of a reverent imagination that we can obtain insight into them, or even discover them. But that man's sin created what, speaking after the manner of men, constituted a great problem, is sufficiently obvious. Sin had to be condemned, and yet the sinner forgiven and saved. The interests of righteousness affecting both God and man had to be maintained, and yet love accomplish its perfect work. God's own nature had to be satisfied—a thought which brings us up to the deepest mystery. But these and all other difficulties were overcome, and the Cross of Jesus Christ at once reveals the freeness of God's mercy, and asserts the claims of the Divine Law in a way which has