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A table of contents for *Journal of the Transactions of the Victoria Institute* can be found here:

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**PROFESSOR TYNDALL'S "FRAGMENTS OF SCIENCE
FOR UNSCIENTIFIC PEOPLE,"—in relation with
Theology and Religion.—By the Rev. W. J. IRONS, D.D.,
Prebendary of St. Paul's, and late Bampton Lecturer.**

A STORY is told by Professor Tyndall in his review of Dr. Bence Jones's *Life of Faraday*, which few persons of education could read without regret. It seems that Faraday was present during a conversation that passed between Sir Humphrey Davy and Wollaston, as to the connexion of electricity with magnetism. Wollaston had perceived that a wire carrying a current ought to rotate round its own axis under the influence of a magnetic pole. Something similar to this, indeed scarcely distinguishable from it, was noticed and announced by Faraday some months later; but, it seems, without any allusion to Wollaston, or to the conversation with Davy; and then there arose some jealousy, suspicion, and resentment. "Wollaston's ideas had been appropriated without acknowledgment!"

2. This, with another equally unpleasant anecdote about the analysis of hydrate of chlorine by Faraday, and the liquefying of another gas by Davy "in the same way," was allowed in the scientific world to irritate the mind of Faraday, one of the best and noblest-hearted of men. Outside the coteries, probably no one believed that Sir Humphrey Davy was jealous, or Faraday capable of the meanness imputed to him. The narrow-mindedness which belongs to the semi-educated will alone account for the development of the *odium scientificum* in such instances as these.

3. It were much to be wished that the tone of mind thus de-

Physical Science, and its rivalries. Example in Wollaston and Faraday.

Another example. Davy and Faraday.

tected were more rare than it is; and we doubt not that it will become so, in proportion as students of science attain a more liberal education the only cure. We deprecate, at present, the attitude of suspicion and disquiet, in some who in other respects deserve our gratitude for their labours in the arduous field of physical inquiry. With their love of truth, and fearlessness of investigation, at least in the department they have chosen, we have the most entire sympathy. We only wish for such scientific friends that spirit also which the leading daily journal recently ascribed to a distinguished moral philosopher of our time, that "earnestness of conviction which is without the least asperity or insinuation against opponents, and this, not from any deficiency of feeling as to the importance of the issue, but from a deliberate and resolutely maintained self-control, and from an over-ruling ever-present sense of the duty, on themes like these, of a more than judicial calmness." *

4. Rivalries, however, in the same departments of knowledge, are by no means unmixed evils, and not unfrequently correct each other; while jealousies among those who are workers for truth in different mines of fact, are as injurious as they are wholly unworthy. The real student of physical science, for instance, is engaged in examining the facts of the outer world, observing their arrangement, ascertaining what seem to be general laws, and defining specific tendencies. The student of moral science, on the other hand, whether as philosopher or theologian, has to do with the facts of the inner sphere of human consciousness, the energies and requirements of personality. Collision between those engaged in two such distinct fields must, we should think, be impossible, unless the one or the other were wandering from his proper duty, and mistaking his way.

5. In calling attention to a recent example of this kind of wandering, very noticeable in the recent popular and justly admired writer to whom we began by referring; we will endeavour to be sensitively on our guard against that which we complain of in others; being persuaded that the interests of truth and knowledge will be advanced by excluding from the lecture-room all side-long sneers at morals and religion, and from the theological chair invectives against rational inquiry and physical investigation. The writer to whom we allude, Dr. Tyndall, has issued a book on which we think it right, in the interests of both truth and

* The review in the *Times* of Mozley's Bampton Lectures on "Miracles and their Credibility."

goodness, to comment. It bears the very attractive title of *Fragments of Science for Unscientific People*. In the class so modestly, it may be compassionately, described, all perhaps are willing to be included who do not set up as original investigators and authorities; and Dr. Tyndall's book assumes, after all, no degrading amount of ignorance in his readers; some, perhaps, will even be flattered by the degree of knowledge, and the mental power, attributed to the "unscientific."

6. The first three essays, as we may for convenience call them, are on the "Constitution of Nature," on "Prayer and Natural Law," and on "Miracles and Special Providences."

The principles of the volume are expressed in these pages, and to these our primary attention will be given, though we shall by no means overlook the rest, as illustrating the same views, and pervaded, we must say, by the same spirit. If we ventured at all on criticism as to any scientific statements laid before us, it would not be because we differ from Dr. Tyndall, whatever he may suppose, as to the uniformity of natural law. The believer in Revelation is quite as ready as other men to affirm of the whole phenomenal universe, that which Scripture declares of the starry heavens,—"*He hath given them a law which shall not be broken.*" What we shall rather have to complain of in our essayist is his want of thoroughness in the appeal to facts; and we must be forgiven if we also demur to the *ad captandum* form in which he states his conclusions, and the irregular unscientific, and illogical appearance of his moral inferences.

Apparent mistake as to the grounds of opposition.

7. What we mean by the "want of thoroughness in the appeal to facts," is that Dr. Tyndall practically forgets that our experience brings us in contact with other realities, besides those natural, mechanical, and chemical facts with which his science is concerned; and that

An imperfect appeal to physical facts.

he thus unavoidably gives a fictitious prominence to his own specialities, when he would introduce them, surreptitiously, we should think, into the sphere of morals and religion. In the description of the "constitution of nature," attention, we would observe, is not directed, specifically, to the human body, its form or functions, but rather to the general framework of the universe, of which it at length is summarily said, that "*the whole stock of energy in the world consists of attractions, repulsions, and motions*" (p. 26); and yet, as if it were Dr. Tyndall's main object, he passes at once from this to ethics.

8. He had previously taught us, in his first sentence, that we can only "conceive of space as infinite," and that "the

* Psalm cxlviii. 6, "Pass beyond."

And then a sudden transition to ethics. quantity of force in *the universe*. is as unalterable as the quantity of matter," forgetting the whole world of thought, which as yet appears to have no ontological relation to space. And he proceeds to shut us up to this, and show in what sense it is affirmed. With the impressions produced on the reader's mind by these, perhaps necessarily, incomplete statements as to an "universe" of an unalterable quantity of force and matter—attractions and repulsions—Dr. Tyndall proceeds in his second essay to assail the Christian habit of prayer, as implying a possible change in this "constitution of the world."

With this in view, he gives us two of his experiences to show, as he conceives, the absurdity (the intellectual "savagery," as he would deem it) of "the idea of direct personal volition mixing itself in the economy of nature" (p. 31), and he congratulates himself and his friends, that they are not as other men are, and have "ceased at least to pray for things in *manifest* contradiction to natural laws" (p. 32), which he supposes theologians must needs do.

9. The first case to illustrate the position he takes up is that of a young Roman Catholic priest, whom he met at the auberge, near the foot of the Rhone glacier, who, in conformity with the custom of the Christian population, had arrived there to bless, or pray God to bless, the mountain pastures of the Valaisians. The priest had no idea, he tells us, that any miracle was to be done (p. 33), it was a simple religious service; and yet the charity and penetration of the essayist describe what this clergyman was about to do as "an official intercession" that "the Highest would make such meteorological arrangements as should insure food and shelter for the flocks and herds." Dr. Tyndall and "a Protestant gentleman who was present smiled at this." Very likely.

10. The next narrative equally stirs "a smile" at the expense of "an honest Tyrolese priest," who, fearing the calamity which seemed imminent on the probable bursting of a glacier, dam, went to the icy spot and celebrated the divinest act of his religious worship, the holy sacrament. The comment on this is that this "honest" and "ignorant" clergyman "firmly believed that in yonder cloud-land matters could be so arranged, without trespassing on the miraculous, that the stream which threatened him and his flock should be caused to shrink within its proper bounds;" the truth being, "that without a disturbance of natural law, quite as serious as the stoppage of an eclipse, or the rolling of the St. Lawrence up the Falls of Niagara, *no act* of humiliation,

But prayer is wrongly opposed to natural law.

And is not necessarily a sign of ignorance.

individual or national, could call one shower from heaven, or deflect towards us a single beam of the sun" (p. 33).

11. It is true that these particular examples of misplaced prayer are mentioned to caution us, lest in our prayers we "ask amiss," and not definitely to prohibit all prayer.

But this is a condescension, only for a time, to our infirmities; for a principle is asserted which Dr. Tyndall certainly refuses to limit, though, in these instances, it has only a particular application to one class of prayers. He mentions in a note, that in so applying it (p. 38), he had in view certain prayers for good harvest and fair weather, then recently ordered in our churches, and he praises the discernment of a few advanced clergymen who declined to adopt these prayers. If the uniformity of natural law is a bar to prayer in some cases, it is difficult for us to see how to refuse the principle in others. Some kind of prayer, indeed, as a sort of "emotional" outlet, to which we will again allude, seems allowed at times by Dr. Tyndall, as if an indulgence to almost pardonable weakness, but by no means as relaxing his assertion of a real physical necessity pervading all nature, inconsistent with all prayer, as commonly understood or used, in any of the conditions of human life.

12. Let us now diverge for a moment from the atoms and molecules, the attractions and repulsions and motions of the universe broadly considered, to those which are to be found in the human organization, which Dr. Tyndall fully recognizes, of course, a little further on, but which he does not much dwell on till he has rejected certain kinds of prayer. He says (p. 120) that "*for every fact of consciousness*" (he having examined, of course, a very few), "*whether in the domain of sense, of thought, or of emotion, a definite molecular condition of motion or structure is set up in the brain.*" The relation "of physics to consciousness being invariable" (he continues), "it follows that, given the state of the brain, the corresponding thought or feeling might be inferred; or, given the thought or feeling, the corresponding state of the brain might be inferred." At the same time he almost contradicts himself by saying that his "molecular groupings, and his molecular motions, do not explain *everything*. In reality (he adds) they *explain nothing*."

13. It passes our power to imagine how Dr. Tyndall, with this admission that his science has no final explanation to offer as to the primary action or motion of either atoms or molecules, and saying that "attraction" and "repulsion" can only be described as "a pull" or "a push," a "pull" of which he knows not *what* pulls it, and

The objection to prayer cannot be partial.

But will reach to every condition of our life as men.

Unscientific character of this objection.

a "push" of which he is equally unaware *what* pushes it (p. 75), can, after all, be so confident against "prayer for favourable seasons;" or, if so determined against that kind of prayer, is not equally disposed to say openly that he "smiles" at every other kind of prayer. At all events, as a man of science, feeling, as he says, "a natural pride in scientific achievement"—(though we should have credited Dr. Tyndall with some higher feeling and aim than what seems to us so poor as this "pride,"—Newton's modesty seems better), he should shrink from making assertions which are found so entirely incommensurate with his inductions.

14. We shall not, if we are allowed to speak for ourselves, consent, for our part, to have it thought that we wish the *facts*

Its assumptions, not its facts, are challenged.

of science to be other than they are; we will only stipulate that in science, as in all things else, the assertions shall keep within the limits of the facts.

"But it is perfectly vain," triumphantly exclaims Dr. Tyndall (p. 92), "to attempt to stop inquiry as to the actual and possible actions of matter and force;" as if he were in bodily fear of some dreadful theologian very likely to attempt that feat.

We publicly affirm that we never yet knew any educated theologian who had jealousy of any facts of science. "But depend upon it" (continues Dr. Tyndall) "if a chemist, by bringing the proper materials together in a retort or crucible, could *make a baby*, he would do it." No doubt he would: and more—we, for our part, shall raise no objection to the fact, when it really takes place. Let it not be assumed then that we are, at the present point, the anxious opponents of "the chemist." Let him do, by all means, all that he can; though, after that, we should still inquire, what and whence was the primary endowment of those molecular attractions and repulsions which issued in their complex organization. We well remember the applause of the Theatre, when we gave Dalton, at Oxford, the honorary degree, which the "author of the atomic theory" graciously accepted. The theologians of the Isis surely evinced little of jealousy; but we are not therefore precluded from pointing out still the unscientific character of any approach to the assertion, or assumption, that we know all about the beginnings of vitality, or its inner nature, or its invariable treatment. Even if the Darwinian evolution were ultimately established as science (as Dr. Tyndall owns, p. 159), it would still remain true, that the human mind would seek to "look *behind* the germ" and "inquire into the history of its genesis."

15. When Dr. Tyndall thus confesses that "of the inner *quality* that enables matter to act on matter we know nothing,"

it is natural to us to ask how he knows even that it is a "quality" of matter at all? That is a pure assumption. If then, the human mind in its scientific imaginations is permitted to "look behind the germ," and think of "the genesis," or the pre-phenomenal origin, we cannot understand why religious thought may not also move in the same direction, without being subject to that unreasonable scorn which it is easy indeed to assume, but impossible for thoughtful persons to feel.

Dr. Tyndall tells us that some of the chemists recoil from certain of his notions as to atoms and molecules, while they are reverting without hesitation to the undulatory theory of light (—not yet, perhaps, quite triumphant)—(p. 136). He points out to them, we think rightly, the vagueness and impossibility of that theory, if the atomic system be denied. He bids us "ask our imagination, if it will accept a vibrating multiple proportion, a numerical ratio in a state of oscillation?" Let us ask him, in our turn, to be as clear and distinct as he would have his chemical friends to be. If he "will focus his seeking intellect so as to give definition without penumbral haze" (we use his own terms) "he will hardly be able to crown his edifice with such abstractions as motion and force,"—or "push," or "pull."

16. To our mind then, Dr. Tyndall's own admissions convict him of *inconsistency*, which is a very serious thing, as it implies a powerful *animus* stirring him to unreasonable opinions and dislikes. We appeal to himself and all competent thinkers, whether he has any right as a scientific man, or any foundation as a reasoner, when he indites a vigorous passage at page 93 of his book, as a sort of "Lay Sermon;"—for if we admit the first half of that passage, we shall find that we destroy all excuse for the rest. "If you ask me" (he says), "whether science has solved, or is likely in our day to solve, the problem of this universe, I must shake my head in doubt. You remember the first Napoleon's question when the *savans* who accompanied him to Egypt discussed in his presence the origin of the universe, and solved it to their own apparent satisfaction. He looked aloft to the starry heavens and said, 'It is all very well, gentlemen; but who *made* all these?' That question still remains unanswered, and science makes *no attempt* to answer it. As far as I can see, there is no quality in the human intellect which is fit to be applied to the solution of the problem. It entirely transcends us. . . . Behind, and above, and around all, the real mystery of this universe lies unsolved, and as far as we are concerned, *is insoluble.*" Such being the avowal of science; the writer then goes off into

theological and ethical advice, and tells us what we are *not* to see or think of as possible, either "behind, above, or around" the "phenomena of matter and force" (*i. e.* "pull and push"). We are told that we are "*not* to see in the phenomena of the material world the evidences of Divine pleasure or displeasure;" and here an excuse is even found for denouncing a superstitious view of the Scotch Sunday, and strange to say, *à propos* of nothing, the "Thirty-nine Articles"!—which are made to rhyme with "particles," in a verse of that strangely conservative-revolutionist, and most illogical thinker, Mr. Carlyle.

17. This sensational style of writing is not only unsuitable to "scientific" men, but scarcely complimentary to the logical faculty of the "unscientific." It is as clearly unreasonable as Dr. Tyndall's assumption that he knows all about the antecedents of motion, which he takes for granted (in the most self-contradictory way) in such frequent sentences of his book as that, for instance, in which he declares that "the dispersion of the slightest mist by the special volition of the Eternal, *would* be as much a miracle as the rolling of the Rhone over the Grimsell precipices and down Haslithal to Brientz" (p. 35). If these ethical sallies were at all necessary to the scientific explorations, we might be more patient of them; but being wholly gratuitous and out of place, suitable only for "young men's debating and mutual improvement societies," we firmly protest, as reasoners, against their inappropriateness, self-contradiction, and we must add with all respect, their unworthy tone.

If the facts of science be really such, when thoroughly examined, as to supersede human prayer and Divine volition altogether, no doubt the facts will prevail, and prayer be at length unknown among civilized men. Meanwhile, it is not too much to ask that the facts be stated, as far as they are known, with as much exactness, and as little metaphor as possible. As yet, they appear to some of us to leave that very hiatus which the "hypothesis of prayer" might require,—even though it were "prayer for fine weather."

18. But it is right now to point out that in viewing the physical order of nature as a whole, we have no right hitherto to pronounce that there is such absolute and rigid uniformity, such absence, we mean, of all approach to spontaneity, as the thermodynamic philosophy would assume. There are signs that there, at least, may be other facts. The consideration of the human organization already referred to (*sect.* 12) may open further possibilities of exception or addition to merely mechanical law. In localizing the functions of human life, physiology, no doubt,

*Its haste to
attach ethical
conclusions.*

*And eagerness to
overstate scientific
inductions.*

advances with increasing precision. The general assignment of digestion to the stomach, of circulation to the heart, and of breathing to the lungs, has become very specific; and far minuter knowledge may be regarded as certain. But there is much less completeness when we come to ascribe to the brain the functions and phenomena of thought.

19. An organ truly ascertained to be such, shows its relation to its functions by its fitness. Thus the orifices and valves of the heart are clearly adapted to its office in the system. This kind of fitness, however, is not Especially as to the human organization. ascertained in the least, and it is difficult, as Dr. Tyndall allows, to conceive that it ever can be, in respect of the brain (p. 121). Though we do not, as in Buffon's time, regard the brain as mucous substance of an unimportant character, yet there is nothing apparently in its structure to suggest the process of thought, as we have seen the contents of the cranium lying before us in a basin,—nor even to vindicate altogether the Cartesian notion that the pineal gland is the seat of the soul. Let us ask how far physiology has proceeded in its analysis, and we then may discover how much remains unapproached.

It would seem fairly certain, for instance, that the cerebral organization is enlarged in proportion as intelligence is manifest in animals. In accordance, too, with the form of brain, and the folds spread over its surface, there probably are different degrees of intelligence. There may also appear to be increasing complexity of organization in the higher animal varieties.

20. We may readily accept all this, and much more, on the testimony of the scientific physiologist, until we have further light. The conditions of life are, no doubt, physiologically similar in the cerebral and other organs. And the physiology of the brain. The blood conveys nutrition, warmth, moisture. Let the blood diminish its flow, and the activity of the organ is at once affected. On a total withdrawal of blood we should expect that the brain would cease to act. A modification even of the temperature of the blood has sensible effect on the brain. (Some of us are certainly more equal to intellectual exertion when we are, as we express it at times, "warm through.")

In addition, too, to the law of general circulation, there is some local law of action and repose, in the examination of which, however, we seem stopped. It is in this local department we find the action of the nerves. While the muscular system acts mechanically, the nervous system and the glands, which act chemically, we are told, are subject to this local law. The brain is no exception to the general law of the circulation of the blood, nor to its local adaptations. In all this, however, we have arrived at no analysis whatever of the thinker, or the thought;

but simply traced the *de facto* residence of the higher consciousness, and the instrument of its action.

21. In reply to certain physiologists who wished to resolve intelligence itself into animal heat, Fernard Papillon, if we may trust the writer in the *Revue des Deux Mondes*, denies that there is any such assimilation of the nervous and muscular system as this would imply.

And the nervous system generally. He urges that the nerve has a kind of self-action, almost spontaneity, which the muscle has not. The muscular fibre never contracts of itself,—it needs to be stirred. The nervous cellule, on the contrary, has an active power of its own. Thus the muscular action may be calculated; and not so the nervous. We seem to be here on the very borders of something beyond determinate, mechanical materialism. At times, indeed, the nervous vitality rules the whole animal power, interrupts, suspends, or otherwise influences changes of heat and motion, and seems to defy all attempt to reduce cerebral life to mechanism. Without supposing this diagnosis to be final, we cannot help feeling that it suggests enough of the unknown to restrain the theories of a hard, all-comprehending materialism, such as Dr. Tyndall needs (p. 92).

22. Thus much, then, is abundantly clear; that in the great kosmos, as well as in the microcosm of the human organization, there are countless points where other and unseen agencies are at work, and that we know of nothing to hinder the calling into new action those invisible powers to the existence of which, in some form, science itself bears witness almost as a necessity of reason. It discovers but a superficial view of facts, then, to reason from the uniformity of certain natural laws against the spontaneity of the genesis, not of one, but even of countless beginnings of action. And this suffices for the whole "theory of prayer." Of course prayer implies a moral world acting on the physical, under the rule of a Moral Governor, and that no doubt is at the bottom of the objections raised. But prayer does not necessarily imply the least change in the elements or the laws of the kosmos, but only the change of *primary* direction by the Ruler of all, or by the manifold powers or forms of originate life ordered by Him.* It contradicts, then, no law, it absolutely requires the intervention of no miracle, to affirm in the universe a place for prayer, so that it need be no fanaticism to assert that even universally "the eye of the Lord is over the righteous, and His ear is open to their prayer."

* See the address on Darwinism, delivered to this Institute in May last, Sections xvi. to xx., &c.

23. There is no need that we should encumber the present simple discourse with any lengthened examination of the argument of Professor Mozley on "miracles," to which Dr. Tyndall so earnestly objects; because it does not stand in our way in the least. It appears to us that Professor Mozley denies the *mathematical necessity* of any "order of nature" that we are acquainted with. Science rightly assumes the order of nature, but has no right to assume its necessity. Nature may, conceivably, have been other than it is, and may therefore be hereafter quite different. "Behold I make all things new" involves no mathematical contradiction, so far as we know, as Mr. John Stuart Mill would himself admit; and we can hardly imagine that any mathematician disputes this, which seems to be the basis of Professor Mozley's argument. With the development of the professor's thoughtful exposition of his subject, especially as to the probability, object, and proof of miracles, we are not here concerned; and we might agree rather at times with Dr. Tyndall in his view that "phenomena are associated with their natural causes" (p. 31), and his openly confessed dissatisfaction with "mere sequences;" in nature. Yet he is inconsistent even here; for, to reduce all nature to necessity is to deny primary causation, or to seek for it beyond the material universe.—But we are treating now of Prayer as capable of holding a place in the system of nature, and we have no need at all to pursue the subject of miracles.

24. One practical remark, however, of Dr. Tyndall must arrest us before we conclude, because it is an appeal to facts, and by facts alone can we stand. He says he believes that, if tested by experience of its results, its "material benefits" (p. 45), prayer would not "last a decade" among us. Now, we are quite aware that the subject of "answers to prayer" is one of frequent difficulty even to religious persons, and it would not be possible in this place to enter upon it; but it must not be forgotten that thoughtful and patient inquirers have arrived at the opposite conclusion from Dr. Tyndall's. In the nature of the case, no one could, however, exactly judge of the answer to any particular expression of human desire, reverently offered to the Moral Ruler of the world, except the man who had so prayed; and the experience of religious persons has, in all ages, been strikingly uniform as to this. Perhaps there is no class of facts in all human cognizance so unmistakable as this which Dr. Tyndall unconsciously appeals to; and the actual connection of prayer with the realities of life is, humanly speaking, the very stronghold of its power.—And this will lead us to point out how the "pure materialist's" science entirely leaves out of consideration all facts except those of sensible

There is no question of the miraculous here.

But of facts,

observation, and takes therefore a most incomplete view of truth and reality.

25. Dr. Tyndall tells us that one of his critics made a mistake in attributing "wit" to him for saying that he took with him to Switzerland "two volumes of *poetry*, Goethe's *Farbenlehre*, and the work on Logic by Mr. Bain." And of the widest range of facts. Possibly his critic supposed Dr. Tyndall to regard logic as light reading, or had met with logical treatises of a fascinating ambition, and more allied to imagination than to strictly "rational" literature. If so, we can certainly sympathize with the critic, and see how he came to misunderstand Dr. Tyndall's ambiguous sentence. But we shall intend no "wit," and fear no mistake however, in pointing to poetry as a witness to *facts*, and facts which will refuse to be ignored. We ask men to look for instance at the Psalms of David—those marvellous poems of the heart of man addressed to the ear of God. "Hear my prayer, O God!" "From the ends of the earth I cry unto thee!" "O thou that hearest prayer, to thee shall all flesh come!" Such are utterances of human nature always calling aloud for Divine intervention; and the book that contains them has been the world's handbook of devotion, more known and used and loved not only than any other book, but more than whole libraries, these three thousand years.

What a book of *facts* is that Book of Psalms! What a key it is to the history of a vast moral world, known in its fulness to Him only who "seeth in secret." Take Dr. Tyndall's word, that in a world of necessary causation, all this means *nothing*—that prayer is an "emotional" operation of so unreal a kind, that a decade (p. 45) ought to see the end of it, and what are we to make of all these, the widest range of the *facts* of our nature, in the midst of which every attempt at induction is so insignificant and vain!

26. Now, we are not complaining that men of mechanical or chemical science do not make it their business at the same time to be moral philosophers, and students of the Facts most unfairly ignored. facts of human nature; but we have a right to complain of their meddling with what they will not take the trouble to understand or investigate. We have a right to complain of their practically ignoring facts which they acknowledge to be co-extensive with our existence (p. 46), or treating them as unrealities. If it be a fact, as none will question, that wherever man is found, in some way "behold he prayeth," we have a right to complain at the attempt of chemists to teach the generation now rising up, and teach with a supercilious air of authority too, that the whole universe, of which we form a part,

consists only of atoms and molecules "satisfied, or unsatisfied." When Dr. Tyndall admits the facts and then disparages them, as if they were ineradicable fancies, he seems to us like the resolute self-deluding theorist who, shrinking from nothing, exclaimed—"Well, I don't deny the facts, but if the facts be so, as you say, then so much the worse for the facts"!

27. A world without prayer seems, no doubt, to be necessary to the moral ideal of the materialist; but he will never get it in the present state of existence. Dr. Tyndall must have some such ideal, for he does not despair of retaining the virtues commonly "termed Christian," A world without prayer. even as a pure materialist (p. 166). He says that he has "as little fellowship with the atheist, who says there is no God, as with the theist, who professes to know the mind of God;" and he acknowledges with Immanuel Kant, "two things fill me with awe; the starry heavens, and the *sense of moral responsibility in man*"! (p. 167). Yet we are to gather from another passage (p. 36) that "the moral responsibility" that so awes him is something independent of that "Free-will" in man which was asserted by Professor Mansel in his Bampton Lectures; though Dr. Tyndall still uses the word "will" (p. 106), and in some sense appeals to it!

28. If Dr. Tyndall could have abstained from what seems, we fear, his besetting habit of fine writing, he might have told us something more clearly of the kind of moral or rightful responsibility which is, after all, the offspring of "necessity." Appeal to the "emotions and affections." But when he approaches this subject he talks persistently in metaphors. It is somewhat trying for plain people to reason with one who tells them that "round about the intellect sweeps the horizon of emotions;" or, that "the circle of human nature is not complete without the arc of feeling" (p. 104). We would ask, are these "emotions" and "feelings" to be exercised on *facts*?—or, on unrealities, that is, fancies contradicted by facts? Elsewhere he warns us of an "incongruous mixture of truth and trust" (p. 48); here he refers us to what he deems the sphere of our "emotions," for our morality and our religion,—leaving us to expect that we shall there find ourselves in that land of shadows. "Appeals to the affections are reserved for cases where moral elevation, and *not historical conviction*, is the aim" (p. 47). We ask, as to these "affections and emotions" which, we are told, are "eminently the court of appeal"—(another metaphor in place of straightforward statement)—"in matters of real religion," are they *true*? We confess that this moonshine style of writing on such a subject is worse than that too well-known "pictorial

sketching" which prevails just now on some of the highest subjects, where exact truth is most wanted. Does not Dr. Tyndall know that the human mind is such that it will at last discredit and distrust "an emotion" which clashes with what it has found to be *true*?

29. Our essayist partly explains perhaps his reasons for adopting his present style of treating these subjects. He thinks that "philosophy is forsaking its ancient metaphysical channels"—and that (if we may try our hand at continuing his metaphor), he may deal with its shallows sportively among the flowery meadows. We think he is mistaken. We will change his metaphor a little. The battle of thought will ultimately rage in those deep places which come close up to the walls of science; and a confident style of writing, even when accompanied by the great merits of Dr. Tyndall, will not be a match for careful thinking on great subjects,—thinking "right on," as straight as mathematics,—with good natural "Barbara Celarent" at hand to help.

We think, too, it is the part of a just philosophical inquirer to represent even those from whom he differs with an equity which they themselves will recognize. We wholly refuse the antagonism which Dr. Tyndall sometimes affirms, and always implies, between men of science, as such, and men of prayer. We feel it to be offensive in purely scientific addresses to have the statement that the "Lord God formed man of the dust" called "a grand old legend" (p. 97), or the words "God saw all that he had made, and behold it was very good," a "grand old story" (p. 99), or to have the same term, "grand fellow" (p. 74), applied to Kepler, apparently to link his illustrious name with the spirit and tone of Science against Prayer. As to this last reference, does not Dr. Tyndall know that Kepler was eminently a man of prayer, and was not only an enthusiastic theologian (like Sir Isaac Newton and John Locke), but worked out all his sublime deductions as *acts of devotion*?—Will Dr. Tyndall accept Kepler's laws as results of prayer? He must: for certainly Brewster says that John Kepler prayed for Divine help and guidance in all his special scientific investigations. If the "working men of Dundee" had been told of this, they might not readily have thought prayer so contemptible.

30. We cannot help thinking that men of science and men of prayer might afford to shake hands together over Kepler's laws. We speak of those who, like Dr. Tyndall, are worthy of the name, for as to others, the inferior spirits of the scientific world, who simply raise a chorus of laughter at the hope and thought that science may one

Rivalries of
theology and
science should
end.

day shut the prospect of a glorious future against a suppliant world lying at the gate of the Eternal,—we care not to speak of them now. So again, there are the rank-and-file of science, collectors and sorters of facts, and nothing more, with no elevation of thought whatever; we can only wish for them an advance in education—perhaps a course of Greek and Latin to brighten their wits. But the bickerings of real thinkers on either side ought to come to an end. It ought, too, to be seen that as surely as oscillations of Uranus detected a far-off planet, and Neptune was revealed at last where the Divine hand had ordered his path unseen as yet, so a confessed want in science, when it tries to trace the path to the origin of all phenomena and spring of all power, points with unerring finger to perturbations which may reveal the spot where the action of the Divine will be found. We “look beyond and behind all the forces of nature;” and even the modern doctrine of the “conservation of forces,” just telling that the sum of the phenomenal remains the same, again teaches us to look beyond the material organization,—even to the pre-phenomenal source of motion, and seek the only answer to the question—“Who made and orders all these?”

31. That the present scientific results are surely leading the way to a higher religious Philosophy, and will conduct to an advanced Ontology, we have no doubt. At the same time it should be confessed that the present *vague-ness* of religious belief, that is, absence of dogma in the true sense of the term, is one of the causes of unbelief among some of the best intellects of our time; though we think the logical results of that unbelief will at length react on the higher religious philosophy. The more earnest, real, and logical science becomes, the more we shall have reason to rejoice. There are no words in Dr. Tyndall’s book more to be prized than these, with which we make to him our closing appeal:—We have “but one desire—to know the truth; and but one fear—to believe a lie” (p. 167).

If it is still for a while to be part of our trial that half-digested theories of science, and “private interpretations of scripture” are to be put in continual collision by less than half-educated minds on either side, let us have patience. Our forbearance may not be misplaced, if we pause in pressing on those who seem now to be antagonists; in order that they may have the opportunity of recovering themselves. It is enough for the present, to point out that no one established scientific fact or thoroughly sure scientific theory, has ever been found to contradict the Bible fairly interpreted by common sense.

On the other hand, let us not be over eager to deduce the knowledge of God from nature, lest while we fail to convince the positive atheist, we put the Christian on the wrong track. For the knowledge of God, so far as nature can suggest it, is, after all, as Pascal simply yet finely expresses it, "barren and useless without the knowledge of Christ."

The CHAIRMAN.—I am sure we all desire to return a cordial vote of thanks to Dr. Irons for his able paper.

Rev. J. HILL, D.D.—As to the subject of this admirable paper; in the first place, I think that we very much over-estimate Professor Tyndall, who has acquired, as it were, a sort of factitious character. I grant that he is a careful experimentalist in the particular subjects in which he has distinguished himself in the world of matter; but in going beyond these, he is altogether a mere trifler, and I think that our lecturer and the public at large, for some reason for which I cannot account, have exalted a man who is a skilful physicist, and a cautious dealer with matter, into a person whose opinions are worthy of consideration upon points which he has not mastered, and in reference to which he is, in reality, no authority whatever. Professor Tyndall is not one of those who have advanced weighty and valuable opinions on the science of the mind; therefore, when he puts forth theories about prayer being opposed to an invariable law, I would ask him, whence comes the law of which he speaks, and is that law superior to the Law Giver? (Hear, hear.) It is in point of fact atheistic to suppose that a law can exist which will counteract the power of Him who made that law. Surely the Being who made the law has the power to abrogate it, and as He has made a law for the regulation of matter, and has determined His own mode of originating and governing the world, so can He alter and adapt the laws He has made to suit His own great purposes. Altogether, if we merely look at the natural world independently of the idea of revelation, we cannot conceive that the Author of that world, the Creator of the ends of the earth, should have laid down a law for the government of the world, and yet should be unable to suspend that law. The theory Professor Tyndall would lay down involves us in the idea of an irresistible necessity over all things. Those who are familiar with Homer will remember that even the Jove of the heathen was inferior to the destinies he was supposed to rule. So inadequate was their conception of the supreme power of the universe, that Jove was actually represented as putting the results of human action into a scale and weighing them in the balance of fate, in order to see how they would turn. We, in these days, have no such low estimation of the Author and Ruler of the universe, and we do not hold with the suggestion that the Great Author of all things cannot control those things which He has created. (Hear.)

Mr. F. WRIGHT.—May I be permitted to ask for a word or two of explanation with regard to a point which, probably through my own fault, does

not seem perfectly clear, and on which I think that all of us might profitably receive another word or two of counsel. It was partially with reference to prayer being opposed to the theory of Professor Tyndall, and to a fact which he is alleged to have ignored. The fact referred to was that David prayed, that all men have prayed, that we pray, and that in all time prayer has been an aspiration of the human heart, and it was said that these facts kicked against Professor Tyndall's theory, and that he had consequently ignored them. I have read the "Fragments of Science" pretty assiduously, and have arrived at much the same convictions and conclusions as those announced by the lecturer; but I do not remember that in any part of those "Fragments" Professor Tyndall either kicks against or ignores the facts alluded to by the lecturer. It is not that Professor Tyndall has disbelieved, or disallowed, or ignored the fact that men have prayed in all time; but that he disbelieves and ignores the statement of fact that those prayers have been answered. As far as I have understood Professor Tyndall, he has looked upon those who have prayed as persons who have prayed in vain,—as having been engaged in idle effort, so far as practical results are concerned. I should like to hear whether I am mistaken upon this point, or whether it is that there are some other facts in connection with prayer which Professor Tyndall may be rightly said to have ignored or disallowed.

Rev. J. MANNERS.—Some time ago, when the British Association met at Norwich, Professor Tyndall gave a very interesting address in his section, and alluded to crystallization, showing that there must be an external intelligence by which crystals were formed. I stated to him at the time that I thought all true science, dealing with causes and origin, had its basis in the spiritual, just as Egypt had its place in history; and to this Professor Tyndall seemed to assent most heartily. He stated that there was a great deal to be said upon the subject, but there were certain phenomena which he did not understand, but was convinced that there was a power or a principle which must be the *causa causarum* of those phenomena. I also gathered from the conversation I had with him that his mind was open to conviction, or rather it was open to inquiry, really, truly, and honestly, into the various causes of the phenomena, apart from what we ordinarily term mere materialism. For instance, I said, in reference to the formation of crystals—"These little particles do not arrange themselves of their own accord: there must be an intelligence, not in themselves, *per se*, but belonging to some superior power, which causes them to move or to be brought into certain conditions." I have not read his book, and do not know what he has stated with regard to prayer, and am not here as an apologist for him, but I do feel that if we rightly understood each other, and if he were here this evening, he might be able to show that his views of true science, and the cause of certain manifestations, would be in harmony and not in any sense discordant with the truth of the Holy Scriptures. I may just say another word; I think that if people would only be content to wait a little, and deal with phenomena as such, and with facts as facts, it would be much better. I once asked a gentleman of high scientific attainments and

great reputation, "When you go into the law of gravitation, or of light, the lines in the spectrum, &c., do you endeavour to determine whether the principle which is at the root of it all works upon its own responsibility?" His answer was, "We have nothing to do with that; we do not go into that at all." Well, that is just what I say. Take an abstract law as such, and what is it? Put this question to the highest authority you like—to La Place, or any great man of science—and they will acknowledge at once that Nature must be pervaded by a Divine intelligence which superintends and directs all these things, that they are not ruled and controlled by any mere abstract law which has simply been impressed on creation. I am certain that were we to compare notes with men in the highest realms of science, there are points upon which,—if really, and truly, and rightly understood,—they would not ignore the simple facts and truths recorded in the volume of Bible history. This, at least, is my firm conviction.

BISHOP M'DOUGALL—I only wish to say a word or two. I was brought up among scientific men, and thrown a great deal into the society of men of unbelief, and afterwards, when I went abroad, it struck me that I found existing among the heathen the very same kind of unbelief that we are now discussing, as to the question of prayer. If you go to the heathen, you find him worshipping a good power and an evil power. He worships the one for benefits, but he is led to be more particular in his worship of the Devil because he fears him most. If you say to him "Do you not believe in the one great Ruler who controls all things?" he will say "Yes; I believe in Him, and that He made all things; but now He sleeps." It seems to me that some scientific men, if questioned in the same way, would say something tantamount to "Yes, we believe in the Creator of all things; but it is of no use to pray to Him, because He sleeps." They have yet to learn to acknowledge that the great God never sleeps, but that His eye is over all things, and that He knows every thought and mystery of our nature.

Rev. C. A. Row.—I feel somewhat painfully placed with respect to this paper. I think it does not grapple with the real difficulty with respect to prayer either from the atheistic or the theistic side; or with the question how it is that prayer can be answered consistently with the maintenance of the laws of the universe. Even taking it from the theistic side, I thought that there the difficulty was, not that God cannot answer prayer, but as to whether He will interfere with the laws of the universe so as to make a direct answer to prayer. The Book of Psalms has been referred to. I do not suppose that Professor Tyndall excepts against the Book of Psalms; but what he does take exception to is the statement that the prayers which involve changes in the physical laws of Nature are answered. He would say that persons pray for things which are very extravagant. It is an undoubted fact that extravagant things are prayed for; but I cannot see in what sense you can allege it against Professor Tyndall that he ignores the fact of these prayers having been offered. What he denies is the fact that the prayers so offered have been answered. There is no doubt that Professor Tyndall has travelled beyond the limits of his facts as a simple student of

physics, and it does often happen that when men have a great reputation for one particular department of knowledge, they fancy that they can maintain the same reputation when they discuss subjects of a totally different character. I do not think, however, that the grounds stated to have been taken by Professor Tyndall—with whose book I am but imperfectly acquainted—have been fully and logically answered. I may be mistaken, having arrived late, and only read the paper since I have been in this room.

Rev. J. W. BUCKLEY.—I should like to put the question in this form : How are we to prove in any way, without taking Scripture into account, that there is ever any answer to prayer? We do not begin, as I think we ought, by proving the truth of the revelation of the Holy Scriptures ; but we start with a sort of loose idea that we can “by searching find out God” in these matters. I do not myself see how any amount of reasoning upon the point can prove that God has answered prayer. A man may say, “I prayed for this ;” but the question is, “How do you know that what has happened is an answer to your prayer ?” I do not see any process open to the human mind, apart from the acceptance of divine revelation, by which it can prove that answers are given to prayer. I therefore demur *in limine* to the discussion of the question whether God hears and answers prayer, unless the revelation of the Scriptures be admitted. We may, indeed, argue thus as to the *probability* that God answers prayer :—If you admit a God—a Supreme Being—at all, it seems to be a most unnatural thing to take up the notion as a truth, that He has constituted us as we are, with our bodies and minds, hearts and souls, so wonderfully formed, and yet that He has altogether withheld His mind from any communication with ours. I hold that this is an unreasonable way of looking at the matter ; that it is a very extraordinary position to take up. If we once admit ourselves to have been constituted, body and soul, by a divine, omnipotent, and intelligent Spirit, as I hold we must do, because we find ourselves here with remarkable faculties ;—if a Being superior to ourselves made us, we can reason on until our reason drives us to this irresistible conclusion, although the Being who is the subject of our reasoning is still totally incomprehensible ;—that there must have existed in the eternity past an infinite and all-powerful Spirit. And when we are driven to this by our reason, we find ourselves almost obliged to admit, that it would be a most extraordinary thing if we were shut out from all communication with that infinite and omnipotent Spirit. But then, by endeavouring to prove this communication, without asking whether this infinite Spirit has revealed anything respecting itself, we are, if I may use the comparison, trying to perform the play of *Hamlet* with *Hamlet* left out,—dealing with a question without touching the foundation upon which it must be based. I therefore demur to the discussion of the question whether prayer is answered or not, without taking the evidence of the Holy Scriptures into account ; because, if you shut the Scriptures out altogether, you are omitting one very considerable and indispensable element. I was glad to hear a gentleman, who has already spoken, say that Professor Tyndall admitted that there was something beyond what he could

account for. But that vague admission is worth little or nothing. We do not want Professor Tyndall, or any "ghost from the grave, to tell us this." We can, I think, account for all, if we have our faith based on reason. And reason shows that there must always have existed some great Infinite Spirit. And then comes the question, has that Great Spirit told us anything of Himself? and if so, how can that be left out of consideration?

Rev. J. H. TITCOMB.—The last speaker has expressed the truth from one side of the question; but I do not think he has approached it from the proper stand-point. What he has said is that which, as Christians, we all fully concur in, namely, that they who discuss the question of prayer ought to admit the truth of divine revelation. This no doubt is eminently satisfactory to those who are here to-night; but it is eminently unsatisfactory to unbelievers, and it seems mere child's play to talk in this way to people who do not believe. We meet on subjects like the present with persons who are outside our own range of thought, and who occupy a totally different stand-point from that on which we are resting. We must, therefore, go into the enemy's camp and attack our opponents where they stand, dealing lovingly, and faithfully, and honourably with them; but at the same time trying to show them that there are difficulties in their own path, and endeavouring to win them over to ourselves. I did not intend to have spoken at all in this discussion; but I could not refrain after what had been said, because I felt it desirable to point out that gentlemen who engage in these matters, meeting as members of a scientific society, ought to deal with such opponents on ground totally different from that of Scriptural belief.

Rev. S. WAINWRIGHT, D.D.—I think that there is obvious ground for us to show that from the stand-point Mr. Titcomb has very properly put down, there is, on scientific grounds, no room for a foothold against what we maintain to be the doctrine of prayer. I hope that Dr. Irons will deal gently with me when he rises at the end of the discussion, if I say that I do not go so far as he has in some respects—while in others I would go beyond him. I think the worthy lecturer has somewhat failed to do justice to himself. I find passages in the paper he has read which contain the germ of a thoroughly complete and crushing refutation of Professor Tyndall's argument; but there they are, waiting, I suppose, for some Darwinian process of evolution to bring them into their final stage of development at some future time. I find in the paper one of those pleasant sentences in which it is said that Professor Tyndall speaks of the relation of physics to consciousness as invariable, and the lecturer says that Professor Tyndall almost contradicts himself. I say that the Professor directly contradicts himself when he says that "the forces which have been present are insufficient cause for all these phenomena." I say that they are altogether insufficient. Coleridge, who thought much on the subject, says there are times when the soul ceases to feel its own impotence, except in regard to its conscious capacity to be filled with the Redeemer's fullness. This may be a delusion on Coleridge's part, and the millions who endorse it may be mistaken; but whether this be so or not, I maintain that they have this consciousness, and I claim that it should be dealt with as a real and ob-

vious fact. It is there that I think it possible to recognise the position Dr. Irons has taken up in speaking of the psalmist. What I understood Dr. Irons to say was, that as a mere matter of fact, man had been praying all over the world, and in all ages, and that this psychological reality must have had the same cause. I have been accustomed to think a good deal of that remark of Coleridge's, in which he asks "Where did the atheist get his idea of the God whose existence he denies?" And I want to apply that thought of Coleridge's to this subject. You will never find an atheist who will be able to answer this question satisfactorily to himself. You say to him, "You deny the existence of God; but where did you get your idea of God? What put it into your head to deny the existence of such a being? Whence came the idea you have formed of the God you deny?" He will probably answer, "I got it from my mother." But then comes the question, "From where did she get it?" There must be an entity to account for the idea. Now I wish to put this question in the same way. Nothing could be more pertinent or just than that, when we get into our pulpits, we should take the scriptural ground upon such a subject; but here we come to maintain the position that the Scripture itself being assailed has nothing to fear when before the tribunal of Science. We take up then the argument of our antagonists, on which it is sought to put the question of scriptural belief, and on examining the grounds of these arguments we find that they prove nothing. You find it to be one of the characteristics of man that he is always found with a capacity and a tendency to prayer, and that he is the only being in whom we find that capacity and that tendency. There is no animal below man in which we find that capacity, and we have never found a single variety of man that is destitute of it. In all ages, and in all parts of the world, we find man yielding to this "superstition," which we are told ought to be exploded in ten years. Professor Tyndall says the relation of physics to consciousness is invariable; but it is clearly not so, for Christian men come into a state of consciousness which they attribute to the spiritual action of an unseen intelligence with whom they believe themselves to be in communion. But at all events they have the consciousness which they are quite certain is not due to physics or to physical causes; and until Professor Tyndall has made his case good, he has no right to draw the conclusion he asks us to adopt. He admits that the molecular groupings he refers to explain nothing in reality. Well, if it be the fact that they explain nothing, we want to know, what is the use of them. There is no man more competent than Professor Tyndall to come into court and state what he believes; but I must object to the conclusions he has arrived at on this subject. I object to much that one reads and hears put forward in this sort of tone. It is often said that people who admit the operation of a law ought of necessity to admit also a law-giver, and that the law-giver has power to change, or abrogate, or suspend his own law; but this admission is very seldom made. On the contrary, we are standing front to front with a system which says that every particle of matter has its own properties, which are capable of making a bubble in the crucible, and that at all events those properties reside in the particles; but another party says "No;

they do not reside in them ; they have been impressed on them." The object of all this is to shut out God from the world, and to assert that there is no God. Now, we face all this rightly when we say, " We will not allow you to assume that there is no force you have not investigated until you account for the origin of the germ or particle, for the genesis of what is behind and beyond the germ." A sufficient answer to all these scientific speculations is that they are assumptions which are based on nescience, and if a man asks " How can God interfere in matters that are going on in the world ? " my answer is " When I am as great as God, and as wise and infinite as He ; when I have entered into the treasure-house of His wisdom, and grasped His infinitude, I will tell you what are the resources of which the Omnipotent avails Himself in order to interfere." At the same time, I think you will agree with me that, taking Professor Tyndall on his own ground, he has failed to prove anything that will tend to establish the conclusions he has drawn.

Mr. J. E. HOWARD.—As one who has been engaged in chemical investigations for the last forty-five years, I desire to say a few words. I am a believer in the efficacy of prayer, and am glad to have heard the remarks which have been made upon this side of the question from all parts of the room. I agree with the last speaker, that the subject has not been entirely probed to the bottom, and that some of the objections of men of science to the assertions of religious men, that prayer is answered, have not been altogether met. I do not know that they could be met except in this way ; that the deeper the researches of science, the more fully we enter upon the investigation of natural laws, the more shall we become convinced of our own ignorance. Before becoming wise a man must be convinced, in a certain sense, that he is a fool ; or at all events, that as the boundaries of our knowledge become extended, they but reveal the vast outlying space of our ignorance. I can see no difficulty in the question presented to us on this occasion ; it may be because I view the whole subject *ab initio* from a different stand-point to that taken by some men of science. I do not believe in a Being who has imposed laws upon atoms, in such sense that the atoms thus endowed with what we call *laws* should be more powerful than the Law-giver himself. If we think, as we must think, upon this subject, we find arising behind us the power of the Infinite, which has been so well described by Sir Isaac Newton in his declaration of faith in the omnipresence of God as the Being who governs all things, not as a soul of the world, but as Lord of the Universe. I cannot repeat that declaration without book ; but my view of the omnipresence and power of God is the same as Newton's ; and that, I assert, rises above and beyond, and far outweighs all considerations about laws, and the mode in which it may please God to act upon matter. If God be pleased to answer prayer, there is nothing that I know of in the constitution of matter which should prevent His doing so. It must surely be as easy for God to act upon matter, as it is for me to crumple up the piece of paper I hold in my hand. That God can answer prayer I am convinced. How he does it is another question which remains to be investigated.

Dr. IRONS.—I shall not detain you long in replying to what has been said, but will endeavour, as far as I am able, to direct my remarks to the point. Dr. Hill wished me to explain, how far the facts of prayer are practically denied by Professor Tyndall? Now, if he refers to my paper, he will find that at section 26 I use the words, "We have a right to complain of their practically ignoring facts which they acknowledge to be co-extensive with our existence," and I refer to p. 46 of Professor Tyndall's book, where he actually admits all that I have said, although he practically ignores it in other places. That must stand as my answer to the implied supposition that I unduly charged him with inconsistency. It seems to me that out of deference, and wishing to pay all respect, to a man of high eminence like Professor Tyndall, I have rather under-stated than over-stated the case. Dr. Wainwright has very truly observed the strength of our side. I have wished, if possible, to be what people might consider ultra-fair. I might, I am aware, have made the matter much more pungent, but not therefore more convincing to the mind of Professor Tyndall, and I wished so to express his position, that if he had been here he would have acknowledged that I had done him no injustice in any of my statements. This leads me to the answer I have to make to my friend Mr. Row, whose many duties have prevented his reading Professor Tyndall's book, or carefully reading my paper. He seems to have been under the impression that I was going to open a general discussion on prayer, and that all the conceivable objections to prayer were to be answered by me to-night. I was not aware that I had undertaken such a task. If you refer to the title of my paper you will see that there is not a word in it about prayer, nor should I have referred to prayer if Professor Tyndall had not done so in several places. I have really dealt with nothing else than Professor Tyndall's book. I am sorry Mr. Row is disappointed. I do not know whether the Council would have wished me to write a paper on the subject of prayer, and to notice all the possible objections to it; I doubt whether they would have entertained such a proposal if I had put it before them; but I had no such object. I knew that Professor Tyndall's book was doing a great deal of mischief, and I endeavoured to deal with its first principle—the necessity of fixed law pervading Nature. I there explained his inconsistency, and showed that he was obliged to make admissions contrary to his very foundations; and yet I am told that I have not answered him! Mr. Row must read Professor Tyndall's book. I am not content, however, to lie under the imputation that I have not, in principle, discussed prayer. I have indeed learnt a humbling lesson from every speaker who has addressed us to-night; for I have been made to feel tolerably certain that no author, however earnest, would willingly write a page if he could only see the shape his propositions would take in the minds of 99 out of every 100 men who read them. In this book-making world one gets driven into writing much which one might not, perhaps, be particularly anxious to do; and your honorary Secretary will bear me witness that I was by no means over-eager to come before you with this paper. I have done so from a sense of duty, and in deference to his expression of the wish of the Council. I hope at

least I have not said in it a single word which Professor Tyndall could justly consider offensive, or which, however misapprehended, scientific men can regard as evincing a wish to travel out of my proper course in order to attack them. I have shown what I deem to be certain of their weak points. Some of them have denied themselves the great consolations of religion, and I have been anxious, if possible, to win them over, and to show them that they are not so philosophical as we. We know their side, and they do not know ours. A large number of the readers of Professor Tyndall's book are among the clergy, for religious men gladly study scientific books ; but on the other hand I believe scientific men only take homœopathic doses of theology—*similia similibus*—they take only what suits themselves. I do wish we could only get them to read our side of the question. As to the gentlemen who have now addressed us, a few words. One inquiry brought forward was,—Where did the atheist get his notion, or how was he certain of his denial of the existence of God ? The speaker who took that line quite forgot that a large and most powerful school of unbelievers is as much aware as he is, that it would be the height of presumption to say there is no God. Herbert Spencer, who is as calm an unbeliever as you can find, rather says—"I don't affirm there is no God. I am simply between the two statements. Some say there is a God ; some say there is not. I only say I am not aware of it." Then, by another speaker, the universality of prayer has been denied. I can only say that I did not affirm more than I thought to be the fact. I affirmed man to be a praying creature wherever, *bonâ fide*, he is found ; but I did not mean to extend the observation to every member of the human race, inclusive of those who have been almost hunted out of their humanity. I do not think individual exceptions would alter the broad fact that man has an ineradicable tendency and capacity to pray. I have dealt with it as a theological fact ; but I have not attempted to push the argument beyond what I thought the premisses allowed. If any one thinks I have urged one argument unfairly, I should be glad if he would show it. I feel sure, at least, that Professor Tyndall would allow that I have done him no injustice. It has been said by another, that we should remember that scientific men admit that there is a germ of force behind phenomena, a something they cannot get at. I ask, whether I did not fully admit this ? and why did the speaker argue as if I had left out what, in fact, was one main consideration of my paper ? That inconsistency in men of science is the very point of my argument. I wish it to be understood, too, that I did not attempt or intend to prove that prayer was always answered, or that there was a specific kind of revelation to that effect. This was not my business. What I did show was, that Professor Tyndall's book contained nothing which ought to teach us the desirability of giving up saying our prayers. It seems that Professor Tyndall, when at Norwich, made so amiable and gentle a speech to one who addressed us to-night, that he almost persuaded that speaker that he was a Christian. (I may say that I have had this feeling myself, both about Professor Tyndall and Herbert Spencer, that at times they go so far towards the mark, and are so well-spoken, that I cannot help thinking they must, as upright, conscientious

and studious men, become, as some have already become, real Christians in the long run.) But that gentleman must not therefore mis-state the arguments in a book he has not studied. The argument in Professor Tyndall's book is against the possibility of an answer to prayer. That is the point I had to meet.—There are other points on which I might dwell; but they are simply mistakes, or personal, and it would be wrong to occupy your attention with what concerns myself alone. I can only thank you for the numerous attendance to-night, and for your kind sympathy and attention; and I trust it may please God to send His blessing upon what I have written, and what has been said.

On the motion of the Honorary Secretary, a vote of thanks was accorded to the Society of Arts for the use of their House.

The Meeting was then adjourned.

NOTE.

ON THE EXTENT TO WHICH PRAYER IS REPUDIATED
BY MATERIALISM.

SOME months have elapsed since the foregoing paper was read : in it Professor Tyndall's "fragmentary" treatment of the gravest of all subjects has been dealt with in a spirit of forbearance, and with the courtesy due to a man of science who had mistaken his way, and shown that he was not qualified for philosophical reasoning. His sincere "love of truth" (*Section 31*) was not doubted ; it was rather with some confidence relied on. If, then, he has placed himself and his cause, before all capable thinkers, in an unintelligible or embarrassing position,* the blame, at all events, is not with us.

Whatever else may afford to be "fragmentary," love of truth cannot. It may be that Professor Tyndall is so fully occupied in his own particular, though somewhat narrow, department of work, that he has no time to give himself thoroughly to philosophy : but if so, he should not capriciously diverge from subjects which he handles with ability to trifle with those for which he shows no aptitude, and in which he refuses to qualify himself. In one respect he has an advantage on his side in such a course ; just as a lecturer on chemistry, at some young "Institute," attracts popular applause by the apparatus which he exhibits, with all the experiments, the explosions, and the lights, which contrast so strikingly with some less charming lecture on history, or jurisprudence, on a previous evening,—and, for the hour, "he may do anything,"—so it is to be feared that there is around Professor Tyndall a mentally juvenile circle of listeners, ready, with *abandon*, to enjoy that which sparkles, and unwilling to take much pains with the graver subjects on which his hasty light only flashes for a moment. Professor Tyndall, of course, may again write, in his bright way, "Fragments of Science for Unscientific People" ; but we are absolutely precluded from issuing Fragments of Thinking for the Unthinking Classes. Our subject restrains this ; and if it did not, yet there are some of us who are so constituted that it is a necessity for us to be thorough, even in the enunciation of a principle, or the expression of the briefest proposition.

But further than this : If there be one thing more than another which wins the philosophic theologian to the lecture-room of the physical-experimentalist, it is the common "love of truth" which makes them brethren ; and if in any case this be questionable—if the "love of truth" turn out, on either side, to be a love of experiment, or of *à priori* prejudice, a thinker finds himself very soon in un congenial society. The professed "love of

* See note, page 136.

truth" which is not entire, seems profane to those who occupy themselves seriously with the deeper problems of our being.

In considering the book of the Professor in the preceding address, it was felt that the principal interest of the audience would probably be concentrated on the second chapter of that book, on *Prayer and Natural Law*. But the task imposed on the lecturer was the review of the teachings of the Professor's volume as a whole, which precluded the possibility of entering into much detail as to any part of it. To indicate the *animus*, to exhibit the pervading tone, and in some sense detect the moral object of the work, was a more arduous task than to point out the illogical character of certain parts; and it was all that was possible within the assigned limits. Enough was said, it is hoped, to convict the erroneous hypotheses and fragmentary assumptions of the Professor's essays, so far as they touched philosophy or religion. As the paragraphs of the address are numbered, it will be sufficient to refer to them, and not quote them, in the following remarks, which are intended to show to all experimental physicists, that neither on moral nor religious questions can they accept Professor Tyndall's guidance without giving up *reason* as well as religion. We shall thus supply, in some measure, a defence of prayer as the habit of the Christian life, which Professor Tyndall and others have ventured so unscientifically to challenge.

Let it at once be noted that, as to all the first principles of his reasonings, the Professor has the greatest inconsistency: the results of which must be pointed out. He states that the *whole stock of energy in the world* consists of attractions, repulsions, and motions (*Section 7*). He rejects as an absurdity all "direct personal volition" as affecting this world; and here he so expresses himself as to deny alike the will of God and of man (*Section 8*). He then illustrates his view by two anecdotes, in which he despises two Roman Catholic clergymen for using prayers for God's blessing on the fruits of the earth, and for favourable mountain weather, as though they expected a miracle; while he admits that they did not, and does not see that he ought to have suspected that he had misapprehended their "theory of prayer." Instead of this, he only ridicules them for going contrary to his own theory (*Section 9, 10*.)

After this general view of the universe—this explanation of what the "whole stock of energy" in the known *rerum natura* consists of, and this exclusion of all will or "volition," to make his theory complete, he somewhat contradictorily admits that, after all, the molecular groupings and molecular motions which were the whole "energy" in the world, "explain nothing!" He even descends from his lofty-seeming terminology to speak of this world-wide stock of "energy" as a series of "pushes" and "pulls," without any cause. Now here, at least, was a *hiatus* in his system, where "volition," one would think, might supply a want; and had he been a philosopher, instead of an experimentalist only, he would not have hesitated at once to suspend his theory that there was no *possible* place, except in the imagination of a "savage," for the supposition of volition "in the economy of nature." (*Sections 12, 13*.) Professor Tyndall, of course, admits that there

is something which "enables matter to act on matter," and then he assumes that it is "an inner quality" of matter, of which we know "nothing!" (Section 15.)

It would seem to require courage of an unusual kind (or, perhaps, a suspicion that materialism had been too strongly expressed) to enable Professor Tyndall after this to quote a popular story of some saying of Napoleon I., as to "Who made the starry heavens?"—and then to wind off with words which might afterwards be quoted to hint that there is a materialism which is not necessarily Atheism!

The inconsistency between the Professor's principles of Universal Materialism, and such a reference as this to a Supreme Volition, is transparent, even though it should, for the time, save the Theism of here and there a speculator. Professor Tyndall is obliged to own that in the universe, which he at first describes as so bound fast in fate that the "relation of physics even to human consciousness is invariable," (Section 12), other and unseen agencies innumerable are constantly at work, beyond all the "molecules" he can tell us of! Religion, however, we remind him, requires no further concession at first than a place for the "unseen agencies." So also prayer needs no more: but the Professor, we conclude, does not perceive this, because he has not studied the subject. If he would not think it too theological, abstruse, and hard, we would suggest he might begin by reading Mr. Croll's careful paper, entitled—"What determines molecular motion—the fundamental problem of nature?"

A love of truth, and a love of thoroughness, oblige us to dwell somewhat longer on the inconsistencies of this materialism in its controversy with religion. When pressed at any time by the charge that the absolute material necessity of universal nature destroys all reasonable religion, the materialists under our Professor's teaching will answer that, even if theologians quietly consent to give up their rationality, they still may rule supreme in the splendid domain of the "emotional." This means, apparently, that men may hope, and fear, and love, and so on, as irrationally as they please. Of course, this may suit the Professor; but it looks to thinkers like insult, and a mockery of the whole subject. For the plain answer is this:—Are not these "emotions" as entirely subject to your "material laws of the universe," as all the physical phenomena around us? If they are so, with what rationality and consistency can we be referred to the "emotional" for a religion beyond the domain of science?

The clergymen whom the Professor praises for refusing to pray for fine weather, most probably are as illogical thinkers as he is; otherwise, they would see that he has furnished them with premisses so comprehensive as to sweep away *all* their prayer-books, and something more, in the conclusions. They have yet, perhaps, to discover that no ingenuity can make a reasonable place for any part of religion, if it be granted that the constitution of the universe is unalterable in every particular, and cannot but be exactly what it is. Any simple example taken from Scripture, or from any book of devotions in any of the churches, might bring this very closely home to a religious mind.

Let any reflect, for example, on such words as these—spoken by a prophet to God Himself, and expressing a truth for us all—“Thou wilt keep him in perfect peace *whose mind is stayed on Thee*, because he trusteth in Thee.” Let this be rationally examined on the principles of universal and unalterable materialism, and the result is of this kind :—

‘The man who knows the unalterableness of every element of existence, may have a *quiet reliance on this knowledge*, come what may ! If, through any defect of his own, he has not this reliance, he may be unreasonable, but yet his own unreasonableness (if that word be at all admissible) is a part of the necessity of his original constitution, and so of his present condition ; and, therefore, it is not unreasonable, but natural, and is even an inevitable or necessary result ; and, therefore, so, it is to be acquiesced in, as really at the same time *reasonable*—even if unreasonable—which, of course, is absurd !’

Advise a person thus reflecting to have recourse to the “emotional” in his constitution, and surely you do not greatly help him, but rather complete his confusion, because he remembers that all human “emotions” are under the same universal law, and they cannot be stirred even by “volition ;” for volition cannot, by any but a “savage,” be supposed to “mix in the economy of nature.” And is he, a good materialist, to turn “savage” in order to keep his religion ? Or, can he, indeed, who is fixed, “turn” anything ?

The truth is, whether they perceive it or not, Professor Tyndall, and the deriders of prayer on his grounds, deny a moral world altogether ; but they do not like to admit it even to themselves. In words we find the Professor even contradicting himself thus :—

“Besides the phenomena which address the senses, which our mind can penetrate, there are laws and principles, and processes which do not address the senses at all ; but which must be, and can be, spiritually discerned.” (See p.p. 74 and 121.)

Could a treatise on the “Power of Prayer” begin with better words ? What then becomes of that totality of “the energy” of the universe which was described as so entirely materialistic ? Professor Tyndall is challenged to answer this. The verbal contradiction seems complete—the inconsistency simply irrational ; but the writer even here does not “speak out.” We complain of all the essayists of this class, that they say and unsay ; and (like the poet’s account of fear) they

“Back recoil, they know not why,
E’en at the sound themselves had made.”

Is it too much to ask for clear heads and honest hearts in those who venture before us on subjects like these ? A perception of the meaning of that which they oppose is the least we can require of them. Before they assail it let them state to themselves, at all events, what our “hypothesis of a moral world” implies—even a vast society of moral agents, individual springs of action, under the moral rule of one Supreme moral Being, the ultimate administrator of all righteousness. (See the “Analysis of Human Responsibility”) ; for until they have mastered this thought, they are not capable of

judging a great moral action, such as true prayer is, from the religious and moral point of view ; and their criticisms are only excused from profanity by being convicted of blindness.

On many grounds it may be well that the battle for Religion has been challenged on the field of Prayer ; because the issue must be both clear and comprehensive. Let no one imagine (as in a late university sermon) that there is any wisdom here in meeting the enemy half-way. On the side of the materialists there is no concession, no modification of the chain of universal necessity, no admission that a volition is conceivable in the "economy of nature." If they speak of prayer as the outlet of human emotions, they also make these emotions to be as truly subject to necessary and invariable law, as are the stars of heaven, or the winds and waters of earth. They know that to admit prayer at all, in the Christian sense, is to admit the Object of prayer, even God, as the moral Governor ; and the idea of God they pronounce "unthinkable, (which may be said of *all the precedentia of thought, as well as of being*"). We can, on our side, admit no less than that to negative prayer, on their ground, is to negative all religion.

To show the denier of prayer that he is shut up to Atheism is to oblige both sides in this controversy to understand their ground ; no slight gain for those who would avoid meaningless wrangling ; such atheism, too, it will inevitably appear, as must deny all morality, as well as religion,—so far as morality depends on volition, or the individual origination of action. We may press this fearlessly home, because the facts of human life and action will eventually always assert themselves and bear down the theorist. Our ethical philosophy must stand on the facts of human nature ; fact alone can determine whether there be a "moral world," in the Christian sense of the words. (See "The Whole Doctrine of Final Causes.")

One illustration shall briefly express what we all mean by a moral world, so that we may confidently leave any one to consider it and compare it with all his experience. Every one may determine for himself whether there is a class of "facts" not mechanical, or not distinctively or principally mechanical ; a class which we usually express by the term moral. Let the case be this :

A man overtaken by some heavy and crushing calamity, overwhelming himself and all who were most dear to him, obtains a sudden and wholly unlooked for alleviation. He may have obtained it in a variety of ways. First, we will suppose it may have come to him in a course of events uncontrolled by either friend or stranger, and perhaps it had come as inevitably, in fact, as the calamity itself had previously seemed to come. Or next, it may have been that the alleviation came through the intervention of the love of some one who deeply cared for him. Or thirdly, the same alleviation may have reached him through the gratitude of a dependent, or of one to whom he had formerly been good ; or fourthly, through the stirring, in many ways, of a "sense of duty," or supposed duty, in others ; or again, through a desire of some one to repair a previous wrong ; or again, in recoil from some plotted malignity ; and so on. There is no need to multiply hypotheses. The alleviation is a fact in each case, we will suppose, quite complete and unequivocal.

The question here arises then, what is the effect on the mind of the receiver? Simple gladness or satisfaction at the alleviation that had come would not, could not, be the entire result in any case but the first supposed. In none of the other cases would the man have the *same* feeling. Various shades of feeling, quite distinct from the mechanical result, would show with delicate accuracy the man's inward and personal appreciation of his deliverance, in some relation to his deliverance—feelings which he would think it *base to disavow*, feelings which belong to his own character, and the value of which he would simply be ashamed to think *wholly* mechanical. On these feelings the man might, or might not, rightly act according to a high standard; but he would know that he *ought*, and he would not like to think his own volition was in such case “excluded from the economy of nature.”

We shall say no more at present as to the “conception of a moral world,” which, we have observed, every one must form before he discourses on the Christian theory and practice of prayer. Enough is suggested, and more is not needed, to show that mechanical, or material causes will not explain all phenomena, and that will, and personal intelligence, have some place in our world. Materialists appeal with confidence at times to Mr. Herbert Spencer as their “thinker.” Will Mr. Herbert Spencer's admission that religion is, *per se*, a fact not to be ignored, satisfy Professor Tyndall? Or will Max Müller's painful “Science of Religion?” Or shall we ask him to ponder a little the words of Mr. John Morley, in his recent book on Voltaire, as we have seen them quoted:

“There is an unknown Element at the bottom of the varieties, whether we agree to call that element a Volition of a superior Being, or an undiscovered set of facts in embryology.”

Truer thinkers than the experimentalists can thus conceive a possible place for that “volition,” the announcement of which is the announcement of the “moral world,” which Christianity and humanity alike assert.

Then, finally, let us think of Prayer as the act and habit of an Agent who originates thought, will, desire, and who is one of a community of such agents, mutually acting on each other, beneath a moral Supreme Governor, whose rule is inseparable from the conception of a vast Community of such responsible agents. (See again “The Analysis of Human Responsibility.”)

As Christians, we derive our notions of prayer from Christ our Master. He has taught us that prayer is the expression of our will, and so discovers our own character. Nothing so truly determines *what we are* as our real wishes. If we put our wishes into words, they are either petitions to men, or prayers to God. In the latter case, we have to consider that, putting our will into words before our Supreme moral Governor, we are speaking to Him who also has a will as to everything; and as He is our perfect ruler, we ought to defer to His will in expressing our own. We secure the higher morality of our own acts of will by conforming in detail to the Supreme will. To Christians the ascertainment of that Supreme will is no impossible or unrewarded aim of the faith and the reason; just as the conscientious ethical effort of any

man is also followed, in things natural, by a growing success in virtue. Effort from the individual, as the frequent spring of action, however subtle in its origin, is a *fact* vindicated in its results. The Christian attempt to conform to the All-perfect is thus encouraged by both the precept and example of our Master.

"After this manner pray ye," is His first precept and instruction for prayer; and its first movement is towards placing man in his true relation at once with God his Father. "Thy name be hallowed—thy rule or kingdom prevail—Thy will be done, as in heaven so on earth;" this is the preliminary condition of all prayer. *All* is to be "after this manner." And His own last personal example of prayer before he died is this, "Not my will but *Thine* be done." The very coarse supposition of the deniers of the moral world—that we in our prayers are to attempt to give law to God, is their own travestie. Even our effort in prayer to rise to the Divine goodness so that we can even believe we are reaching it, "in prayer believing," is still guarded by this,—“Ye ask and receive not if ye ask amiss, to consume it on your lusts.”

And thus we do not shrink from the examination of the broad question as to the whole subject of definite answers to prayer, if once it be based, as Christ has based it, on this moral foundation. A grand answer to such inquiries is to be found indeed in the lives of all the Saints, both under the Old Covenant and the New. Elijah's prayer both for and against rain, is referred to in the New Testament expressly to tell us how "effectual" even in detail, may often be the prayer of the "righteous," i.e., of those who have brought their will to be one with God's. So Job's intercessions are truly "answered," because he had spoken of God "the thing that was right." On the other hand, St. Paul's prayer for deliverance from some special affliction, being in some degree "asked amiss," was answered not directly, he says, but in a way that brought his will nearer to God's will,—“My grace shall be sufficient for thee.”

What prayer, indeed, has actually done on the largest scale, the whole world can tell. Those few men praying in the Upper Chamber a few days before the first Pentecost set in motion causes which, by the will of God, have created Christendom, and (what is more than all that is commonly called Christendom) a line of "saints" from age to age who have lived above the world, and helped in ten thousand ways to raise the world also. And it is not in the Bacons and Newtons and Keplers alone—the world's giants—nor even in Athanasius or Anselm or Bernard, that we have knowledge of the dignity and moral power of prayer, but in humble hundreds of millions of a baptized world, whose countless utterances, "Thy will be done," have conformed them to that will, and calmed their lives, and cheered their deaths. But there are some things, even as to prayer, which St. Paul said it "was not lawful to utter"—the secret communings of the Spirit of Man with the "God who heareth Prayer." We speak but to Christians here. They have "fellowship" with God.

To conclude. There are no facts more certain, more universally recognized,

more indestructible, than the moral and religious realities of human consciousness. Among those facts the distinctively religious are the plainest. The *consensus omnium* as to the being of a Power superior to Nature is a fact. The conscious good of Being, and hope of Future being, are facts. The desirableness of Right-doing; the wisdom of a pure direction of our Will; the inward Peace of nobleness in action; the inward sense of Retribution for wrong;—these are “facts” which, as Mr. Herbert Spencer will yet teach his feeble followers, cannot be ignored in a true philosophy. Here it is that we see how the physical order of nature and the moral are distinct. Experimentalists insist that the physical order is a necessary whole; they would say, with emphasis, that all “molecules” are mutually dependent beings. But in the moral world we all recognize individual agency,—agency from itself, upon itself, and amidst, and upon the whole.

The Materialists’ philosophy is self-limited at the outset to the phenomenal. It begins with the contradictory assumption that there is no unphenomenal and no prephenomenal. Then it recoils from its assumption, on finding that it cannot detect the starting-point of phenomena, and is obliged to own a coming forth from the unseen.

Some reason that precedes reasoning; some *ego* that precedes thought and action, is as indispensable to Materialists as to us. And the moment they admit this, they have surrendered the entire pretended principle on which alone they can call in question the Christian doctrine and practice of Prayer.

Their Pantheistic-seeming phrases as to the “conservation of force,” or “conservation of energy,” will not help the Materialists in the least to evade our conclusion. The mutual “convertibility,” or the “conservation” alike attests the unseen power which “converts” or “conserves.” So, then, the Experimentalists’ denial of Prayer, as the Scriptures teach it, is not only a denial of Christianity, but a denial of all communion of man and God; and it is even a rejection of the primary admissions of science itself, and of facts of the world, both physical and moral.

WILLIAM J. IRONS.