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No. 1

THE SCOTTISH PHILOSOPHY.

BY F. TRACY, B.A., PH.D.

[An Address delivered before the Philosophical Society, March 22nd, 1895.]

ONLY the briefest notice of this important school of thought is possible within our present limits; and in this brief notice, regard shall be had mainly to the doctrine of perception—chiefly indeed to the epistemological side of that doctrine—as it developed in the hands of the four leading representatives of the Scottish Philosophy—Reid, Stewart, Brown, and Hamilton.

The Scottish philosophy in general may be characterized as a vigorous reaction against the hopeless and suicidal scepticism, in which English empiricism had found its legitimate issue. Locke had declared that all the data of knowledge are contributed *to*, and in no sense constructed *by*, the intelligence: and therefore, that any idea which is not thus given—such as the ideas of substance, cause, and the like—must be resolved into a “tendency to suppose,” in reality into a baseless and gratuitous supposition. He therefore expressed himself as “inclined to think a science of nature impossible,” inasmuch as natural science, according to the empirical view, can have nothing to rest upon but these gratuitous suppositions. Nevertheless, he still unwarrantably retained an unknown material substrate, as cause of our ideas, as well as a spiritual substrate, as recipient of those ideas. Berkeley, logical on one side at least, abolished the material substrate, but, illogically, retained the

spiritual. Obviously the spiritual entity of Berkeley, on a purely empirical theory of knowledge, rested upon a foundation no whit more secure than did the material entity of Locke. Hence it was to be expected that Hume, with his keen logical powers, and his utter innocence of any scruples regarding the consequences to which his reasoning might lead, would not be slow to perceive the inconsistencies of both his predecessors. He abandoned both the material and the spiritual substrate, and reached a position of such thoroughgoing scepticism as left no justification for any science whatsoever.

These startling conclusions, set forth so clearly and forcibly, made men pause. Scepticism can never be more than a temporary phase of philosophic thought. Yet there seemed no radical flaw in Hume's arguments; and the question therefore arose, whether there were not some flaw in the premises from which those arguments were drawn. A double reaction ensued; the first in Germany, where Kant, roused by Hume's startling conclusions, set himself to reconsider, in a critical mode, the primary postulates of cognition, the conditions upon which the possibility of knowledge depends; the second in Scotland, where Reid, shocked by the moral anarchy, to which this intellectual scepticism was likely to lead, also set himself upon the consideration of first principles. "The doctrines of Reid and Kant are both avowedly recoils from the annihilating scepticism of Hume—both attempts to find for philosophy deeper foundations than those which he had so thoroughly subverted." Reid says, in the dedication of his work: "I never thought of calling in question the principles commonly received with regard to the human understanding, until the 'Treatise of Human Nature' appeared in the year 1739. The ingenious author of that treatise hath, upon the principles of Locke—who was no sceptic—built a system of scepticism which leaves no ground to believe any one thing rather than its contrary; there was therefore a necessity to call in question the principles upon which it was founded, or to admit the conclusion." He then goes on to say that he for one cannot admit the conclusion, because absolute scepticism is destructive, not only of Christian faith, but equally so of philosophy and science. He therefore proceeds to examine the principles on which this sceptical system is built; and

finds that it leans for its whole weight upon an hypothesis: viz. that nothing is perceived but what is in the mind that perceives it; that we do not really perceive external things, but only certain images and pictures of them imprinted on the mind, which are called impressions and ideas. "If this be true, supposing certain impressions and ideas to exist in my mind, I cannot from their existence infer the existence of anything else; my impressions and ideas are the only existences of which I can have any knowledge or conception; and they are such fleeting and transitory beings, that they can have no existence at all, any longer than I am conscious of them. So that, upon this hypothesis, the whole universe about me, bodies and spirits, sun, moon, stars and earth, friends and relations, all things without exception, which I imagined to have a permanent existence, whether I thought of them or not, vanish at once,

'And, like the baseless fabric of a vision,
Leave not a wrack behind.'

I thought it unreasonable, upon the authority of philosophers, to admit an hypothesis which, in my opinion, overturns all philosophy, all religion and virtue, and all common sense; and finding that all the systems concerning the human understanding which I was acquainted with were built upon this hypothesis, I resolved to inquire into this subject anew, without regard to any hypothesis."

Such is the *raison d'être* of the Scottish philosophy, as stated by one who may perhaps be called, for our purpose, its founder. Sir Wm. Hamilton, the greatest by far of the exponents of this school, states as follows the two cardinal points in Hume, against which the attack of the Scottish philosophers is directed: Hume maintains (1) that the notions of cause and effect, substance and accident, have no genuine necessity, or at best only a subjective one; (2) that the mind is not conscious of any real existence in perception; that its representations are no guarantee for anything represented. Against these two positions Reid reacts, and appeals from the "soaring genius and inexorable logic" of philosophers, to *common sense*, by which I think he means the ordinary naïve judgment and belief of the majority of plain men, as to the reality and externality of the objects of

perception, and the objective validity of the ideas of cause, substance, and the like.

The Scottish school, then, maintains that by self-observation of the operations of the mind—introspection—certain self-evident, necessary and universal principles are discovered, common to all men, by which their actions are regulated and their beliefs justified. These are the principles of *common sense*. Dr. McCosh claims for the Scottish philosophy the following peculiar excellences: (1) It proceeds on the method of observation, professedly and really; (2) It employs self-consciousness as the instrument of observation; (3) By the observations of consciousness, principles are reached which are prior to, and independent of, experience. "This grand characteristic of the school distinguishes it, on the one hand, from empiricism and sensationalism, and, on the other, from the dogmatism and *a priori* speculation of all ages and countries."

Dr. Thomas Reid, who became professor of moral philosophy in Glasgow in 1763, gave to the world his philosophical views in two elaborate works, dealing respectively with the "intellectual" and "active" powers of man. He was a thoroughly honest, earnest, reverent spirit, who combined a fair order of intellectual ability, with such an intense moral earnestness, that Cousin speaks of him as the modern Socrates. The main point against which he directs his polemic is this doctrine of the empiricists, that the only objects of knowledge are "ideas or images in the mind." He saw clearly the necessity of claiming for knowledge more than a mere subjective validity, and he did not see that this could be done in any other way than by denying the generally-received philosophical maxim that knowledge is mediate. He will not have it that the external world is apprehended only mediately and by a process. External reality is immediately known, or, to speak from the other end, that which we immediately apprehend is external reality. "I am immediately conscious of the stars when I look upon them." "When I remember the smell of the tuberose, that very sensation which I had yesterday, and which has now no more any existence, is the immediate object of my memory." Perception, consciousness, memory, are ultimate, original, inexplicable faculties, operating immediately. In support of this position he

appeals from the reasonings of philosophers to the ordinary, unsophisticated convictions of mankind in general. In spite of all our learned philosophical analyses of perception, memory, etc., we are, after all, each of us, irresistibly convinced, by our common sense, of external reality, and of the events of our past experience. (It is scarcely necessary to point out that both Berkeley and Hume would freely acknowledge this "conviction of the ordinary intelligence," nor did they consider it at all incompatible with their idealism. They differ from Reid in feeling the necessity of explaining it, instead of accepting it as sufficient proof of the objective validity of perception.)

Reid, however, is not entirely consistent with himself all through. Under the influence of Berkeley, he confesses that we do not see the distance of objects, and admits that "certain appearances (*e. g.*, of seeing the distance of an object) must be resolved into habits of perception, which are acquired by custom, but are apt to be mistaken for original perceptions." The wonder is that he did not see to what this principle, once acknowledged, must by an "irresistible conviction" lead.

Reid's doctrine of perception, then, may be stated negatively and positively. Negatively, he declares :

(1) That we do not perceive by means of ideas, either in the mind, or out of it, coming between the mind and the object perceived ;

(2) That we do not reach a knowledge of external objects by means of reasoning ;

(3) That, in order to the conception of anything, it is not necessary to have some impression or idea in our mind which resembles it. (This, in opposition to Locke's doctrine of the Primary Qualities.)

Positively he analyzes perception as follows :

(1) Some conception or notion of the object perceived ; (2) a strong and irresistible conviction and belief of its present existence ; (3) that this conviction and belief are *immediate, and not the effect of reasoning*. Like Locke, he distinguishes between the primary and secondary qualities of bodies, but grounds the distinction upon a different principle. Locke's primary qualities are "such as are utterly inseparable from the body in what state soever it may be" (Essay ii. 8.) ; with Reid the distinction

is this, that our senses give us a direct and distinct notion of the primary qualities, and inform us what they are in themselves; whereas, of the secondary, our senses give us only a relative and obscure notion; telling us, not what they are in themselves, but only what they are in relation to us.

It is important to bear in mind, therefore, that when Reid speaks of perception as being *immediate*, he means, not that the *object* of perception is immediately present to consciousness, but that there is produced *somehow*, along with the perceptive experience, an immediate and irresistible conviction and belief of the present existence of the object. Obviously then Reid has failed to establish the objective validity of knowledge on a basis solid enough to satisfy any except those who may be content with the postulate of a "strong and irresistible conviction," which in turn is expressly declared to be "ultimate and inexplicable."

Dugald Stewart was born in Edinburgh, and studied philosophy there under Adam Ferguson. He also attended Reid's lectures in Glasgow. He combined mathematical studies with metaphysical, to such good purpose that in 1772 he was appointed, in his father's stead, to the Chair of Mathematics in Edinburgh, which he filled for thirteen years. He then succeeded Ferguson in the Chair of Moral Philosophy, a position which he retained for twenty-five years (1785-1810). His collected works were edited by Sir Wm. Hamilton, and published in ten volumes.

Stewart need not detain us long. Reid's pupil, he seems to have accepted Reid's philosophy as it stood. Of a cautious and timid nature, he avoided discussion and polemics, "caring more for an elegant and precise style, than for exact and careful analysis." He constantly refers to Reid, whom he seems to consider almost infallible. His attitude towards his master may be judged from the following quotation: "Dr. Reid was the first person to lay completely aside all the common hypothetical language concerning perception, and exhibit the difficulty in all its magnitude by a plain statement of the facts." He credits Reid with having shown "that the mind is so formed, that certain impressions, produced on our organs of sense by external objects, are followed by correspondent sensations, and that these sensations are followed by a perception of the exist-

ence and qualities of the bodies by which the impressions are made; that all the steps of this process are equally incomprehensible; and that, for anything we can prove to the contrary, the connexion between the sensation and the perception, as well as that between the impression and the sensation, may be arbitrary." Like Reid, Stewart claims that perception is immediate, and endeavors to explain how it is that philosophers have had recourse to the doctrine of mediate perception. They evidently supposed, he says, that there must of necessity be some medium of communication between the object of perception and the percipient mind, on account of the essential distinction between mind and matter. He himself, of course, does not admit this necessity.

An interesting result of this general standpoint is Stewart's doctrine, that reasoning is a succession of intuitive judgments, and his opinion that instantaneous judgments are more trustworthy than are deliberately formed conclusions.

Dr. Thomas Brown was the pupil and successor of Stewart in Edinburgh. He lectured on mental and moral philosophy from 1810 to his death in 1820. He was very popular with the students, and, indeed, he seems to have possessed a much more independent spirit than Stewart. Brown deserves to be remembered for his researches in physiological psychology. He was among the first to discriminate the sensations usually ascribed to Touch, and to separate the muscular sense from Touch proper. Almost contemporary with Sir Charles Bell's discovery of the distinction between sensor and motor nerves, Brown declared it as his opinion that "the feeling of resistance is to be ascribed, not to an organ of Touch, but to our muscular frame."

In several respects he criticises Reid and Stewart severely, and it would scarcely be too much to say, that he departs entirely from the standpoint of the school of Reid in some very essential particulars. He seems to have read widely, and there is little doubt that he was influenced by the French Sensational School, and by the Associational philosophy of England, as well as by the Scottish philosophy. Like his predecessors in Edinburgh and Glasgow, he stoutly maintains the existence of principles of irresistible conviction and belief; and, like them, he makes no attempt to account for those principles. Like the French

philosophers he endeavors to simplify matters by reducing the phenomena of mind to as few classes as possible. His classification is: 1st, *Sensation*; 2nd, *Simple and Relative Suggestion*; and 3rd, *Emotion*. The formation of the general notion he attributes to a feeling of resemblance. In treating of perception by the senses, he holds that we look immediately on the sensation in the mind, and not on anything out of the mind. A knowledge of body is reached by inference. (Here he departs completely from the position of the Scottish school.) Mind perceives only sensation; but every phenomenon must have a cause. This axiom of causation is intuitive and irresistible. This cause of sensations is not in the mind itself (as is the case with the sentiments), therefore it must be external, and therefore material. Here he prepares the way for the doctrine of J. S. Mill, that our idea of body merely amounts to the idea of a possibility of sensations.

Sir Wm. Hamilton was born in Glasgow in 1788, and graduated from the university of his native city at eighteen years of age, with the highest honors in logic and moral philosophy. Having obtained an exhibition which required the holder to study at Oxford, he went there in 1807. Here his independence of spirit showed itself in his method of study. He read on lines chosen by himself. His examination was considered one of "unparalleled distinction." He chose for examination four times the usual amount of work, and answered in such a way as to stagger his examiners. In 1836 he was appointed to the chair of logic and metaphysics in the University of Edinburgh, which he continued to hold until his death in 1856. He worked ten years on Reid, and brought out his annotated edition. The most valuable part of this work is the part contributed by Hamilton. He also republished, with additions, his contributions to the *Edinburgh Review*, wrote his lectures on logic and metaphysics, and edited the works of Stewart. The dissertations and notes in the edition of Reid represent the fullest development of his philosophical doctrines. Veitch says the "lectures" can, on many topics, be taken only as the point from which he started in his career of philosophical investigation. Mill, however, in his "Examination," falls into the constant error of taking them as "the fullest exposition of his philosophy."

Hamilton was by far the clearest thinker, the most profound scholar, and the most influential exponent of the Scottish philosophy. His influence was greater than that of any other teacher of his times. Not only was he more learned in the classical literature and the philosophy of Aristotle and the ancients, but, as Clark Murray says, he was, "with the doubtful exception of Coleridge, the first British thinker who had studied the philosophy of Germany with sufficient appreciation to receive from it a distinct mould in his intellectual character." Of course this does not imply that he fully understood the German philosophy; *e. g.*, he evidently believes that Kant and Reid take the same view of the *necessity* which is supposed to attach to first principles, which is far from being the case. It may also be remarked that Hamilton, while professedly adhering to the philosophy of common sense, really surrenders, without seeming to be aware of it, the fundamental position of that philosophy, when he declares that the whole content of perception, except the formless material contributed by sensation, is the work of thought or judgment (words which Kant might have used).

Hamilton's starting point and object of study is *mind*; or, rather, it would be truer to him to say that he begins with the principle of causality, and the investigation of this principle leads him directly to the postulate of mind. The questions that can be asked concerning mind are these :

(1) What are the facts or phenomena of mind? The answer to this question constitutes the phenomenology of mind, or phenomenal psychology.

(2) What are the laws by which these facts are governed? The answer to this is the nomology of mind, or nomological psychology.

(3) What inferences regarding noumena are warranted by these facts and laws? The answer here constitutes inferential psychology, ontology, metaphysic.

Under the first head we have descriptive psychology, the observation and classification of mental phenomena, the grouping of the facts of mind. Under the second we must take account of two sorts of laws : (*a*) Ultimate principles of reason, necessary and universal principles of thought, such as the axioms of logic ; (*b*) Derivative or empirical laws, uniformities

generalized from experience. Under the third head we consider those topics concerning which we may draw inferences from the facts. The objects of these inferences are not facts, but suprafactual, not conditioned, but the conditions of the facts, not phenomena, but the noumenal substances underlying phenomena, the soul, the cosmos, the Deity.

If we begin now with the first question, and ask: What is a mental phenomenon? the answer which forces itself upon us at the outset is that it is *conscious*. A fact of mind is what it is, by virtue of its being known; but to be known is to be in consciousness. Hence the fundamental point in the psychology of Hamilton is *consciousness*. This is the string upon which the pearls of the mental life are strung. Philosophy is simply the explication of human consciousness. Consciousness forms the ground of the possibility of experience. "In all legitimate speculation regarding the phenomena of mind, it is consciousness which affords us at once the capacity of knowledge, the means of observation, the point from which our investigations should depart, the limit of our inquiry, the measure of its validity, and the warrant of its truth."

Hamilton's method, then, is analytic, and the analysis yields us, under the first head, three classes of mental phenomena: Cognitions, feelings, and conations (desire and will). Under the second, proceeding upon the distinction noticed above, between ultimate and derivative laws, he insists, with great emphasis, that nothing derivative shall be accepted as a fact of consciousness. "Wherever in our analysis of the intellectual phenomena we arrive at an element which we cannot reduce to a generalization from experience, *but which lies at the root of all experience*, and which we cannot therefore resolve into any higher principle, this we properly call a fact of consciousness." (Observe how the word *fact* is now widened in its meaning so as to include ultimate *laws*, as well as simple *phenomena*.) "Looking to such a fact of consciousness as the last result of an analysis, we call it an *ultimate* principle; looking from it as the first constituent of all intellectual combination, we call it a *primary* principle." These primary data of consciousness are marked by the characteristics of *simplicity* (*i. e.*, they are irreducible to any simpler elements), *necessity* (*i. e.*, it is impossible to question the

veracity of consciousness), and *incomprehensibility* (i. e., consciousness tells us only *that* its object is, not *how* or *why* it is; otherwise this latter knowledge would be prior to that which has been declared ultimate or primary, which is a contradiction).

All mental phenomena are forms or phases of consciousness. "Consciousness is to the mind what extension is to matter." Hence the laws of consciousness are, in a very essential respect, the laws of mental phenomena. Consequently nomology, or the investigation of the *laws* of consciousness, though standing second in the outline above, is to be taken up first. And the investigation of this does *not* include the attempt to explain how consciousness is possible, or how the distinction of ego and non-ego can be conceived as possible. These and similar questions are unphilosophical, since they "suppose the possibility of a faculty exterior to consciousness, and conversant about its operations." But there is no such faculty; consciousness is the only instrument of knowledge. When, however, we come to inquire what is given in any simple act of consciousness, we find more than that "mere awareness" to which present-day psychologists are so fond of reducing consciousness in its lowest terms. According to Hamilton the analysis of the simplest activity of consciousness yields no less than the following three things: 1st, a knowing subject; 2nd, a known modification; 3rd, a knowledge of the subject of the modification. In other words, consciousness always includes *self-consciousness*, for in the simplest act of knowledge we have given the distinction of subject and object.

But to pass on to Hamilton's doctrine of perception. Nothing shows more clearly than this how the epistemology of the Scottish school became gradually modified in passing through the hands of its most illustrious exponents. Hamilton gradually shifted his ground with reference to perception. At the outset, his position resembles very closely that of Reid. In perception by the senses, external reality is immediately revealed to us. "In this act I am conscious of myself as the perceiving subject, and of an external reality as the object perceived; and I am conscious of both existences in the same indivisible moment of intuition. The knowledge of the subject does not precede or follow the knowledge of the object; neither determines, neither is determined by, the other. The two terms of correlation stand

in mutual counterpoise and equal independence; they are given as connected in the synthesis of knowledge, but as contrasted in the antithesis of existence." But, now, to meet the very obvious objection that there are several very complex processes between the object and the subject's knowledge of that object (ether waves, nerve-vibrations, etc.), Hamilton adds these two statements:

(1) The mind is not solely in the brain, but in every part of the body; and (2) the external object perceived is not the *distant* object, but only that which is in contact with the organism (the air that vibrates against my tympanic membrane, the retinal image in vision, etc.). All distant objects are known by inference. But in the Appendix to his edition of Reid, Hamilton still further restricts the sphere of immediate perception. In the first place he distinguishes two sorts of material reality; the *organism* and the *extra-organic world*. In the second place he enlarges the meaning of sensation, so that it no longer means a state of consciousness simply, but consciousness of the sentient organism. And in the third place he ceases to define perception as consciousness of the object in so far as it comes into spatial contact with the organism, but as simply the apprehension of the locality and relations—"mutual outness"—of sensations, and, more particularly, the apprehension, through impeded muscular activity, of a resisting somewhat in contact with the organism.

We see, then, that Hamilton has made in succession, *three* important modifications in the doctrine of perception; and in each of these modifications he recedes a little further from the standpoint of naïve Realism, so heroically taken by Reid:

Reid said: In perception we have immediate knowledge of the object, however distant in space.

Hamilton said: (1) In perception we do have immediate knowledge, not only of the ego, but equally of the non-ego.

(2) Not of *all* the non-ego, but only of that portion of it which comes into immediate spatial contact with the organism. This we have by all the senses.

(3) Not by all the senses, but only by the muscular sense, through which we are made aware of the presence of a something which opposes itself as an obstacle in the way of our muscular activity. As for the other senses, they reveal only the locality

and mutual externality of sensations in the organism. "The existence of an extra-organic world is apprehended in the consciousness that our locomotive energy is resisted, and not resisted by aught in our organism itself. For in the consciousness of being thus resisted is involved as a correlative, the consciousness of a resisting something external to our organism. Both are therefore conjunctly apprehended."

Time does not permit me to enter into an extended criticism of the Scottish philosophy; but there is one thing which, it seems to me, must have grown more and more obvious to you as the exposition proceeded: viz., that these Scottish philosophers, however sincere their purpose, and however great their ability, have not succeeded in clearing up the difficulty with which we began, nor in solving the epistemological enigma which has puzzled all modern philosophy. The questions: How does mind know its object? and, what is the relation in which mind stands to the material world? are left almost where they were before. We began with Locke's declaration that the only objects of knowledge are ideas in the mind. This led to scepticism. We finish with Sir Wm. Hamilton's declaration that in perception the mind is aware of the mutual externality of its sensations, and that in muscular experiences of impeded activity the non-ego is "given." But how "given"? Muscular sensations are only sensations after all, like all others; and, as Berkeley would probably have said, the non-ego is no more "given" in a muscular feeling than in any other feeling. Were there no material universe at all, God could still cause us to experience all the muscular sensations that we have now. Or (as Hume would probably have said) this, which you call impeded muscular activity, is only an *impression*; and this postulate you make of the non-ego, is only an *idea*; you have not the slightest guarantee that either of these exists anywhere except in your mind; you are very far from being justified in basing on them any claim regarding either the knowledge, or the existence of an external world. Reid's argument from the "irresistible convictions" of men will appeal more strongly to some of you, less strongly to others; but after allowing it all possible weight, it still seems necessary to maintain that if there is to be any successful theory of knowledge, it must begin, not with a dualism of

thought and thing which is incapable of reconciliation, nor with a naïve realism that furnishes no satisfactory answer to the sceptic, but rather with some form of the doctrine that in the constitution of any world, of which philosophy can be expected to give an intelligible account, thought must be, not a mere passive spectator, but an active participator.

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ASTRÉE.

BY J. SQUAIR, B.A.

[Read before the Modern Language Club.]

It is almost a common-place of our day to say that it is only since Jean-Jacques Rousseau that men have had any love for nature. It is true that the growth of immense cities has created a necessity for quiet and repose such as men did not feel in former times, and that the great diffusion of the comforts and machinery of civilization has made it possible for a larger number of people to escape from the man-made town to the God-made country. But to suppose that the men of earlier times had no eye for the charms of nature would be erroneous. We have a vast mass of literature covering a period of at least two centuries (1500-1700) in all the countries of Western Europe which attests in the clearest way the great strength of the love of nature which accompanied the Renaissance movement. Like other strong movements it projected itself forward in an artificial form, into a period to which it did not naturally belong, and finally died of its artificiality. Since literature is a thing of books it easily becomes "bookish." The traditional has a tendency to prevail over real feeling. So this love of nature, being unequally yoked in Renaissance times with admiration for classical literature, commenced to apologise for itself by adopting forms of expression inspired by Greek and Roman writers, like Theocritus and Virgil. Critics have said that this pastoral literature was due to classical influence, because it borrowed a certain amount of machinery from Greece and Rome, but the truth is it was largely a popular growth. It was written and read by people who knew nothing about ancient literature. Racan, for example, a writer of *Bergeries*, did not know, it is said, a word of Latin, to say nothing of Greek. It is probable there would have been a pastoral literature even if Virgil had never written his *Eclogues*, only it would have had a different form from what it actually had.

I have intimated that the pastoral literature had its rise in the Renaissance movement, but the existence of a somewhat similar kind of writings in pre-Renaissance times, might lead us to believe that it had its origin in the earlier Middle Ages. The similar kind of mediæval writings to which I refer is the graceful *pastourelle*, one of the earliest forms of lyric poetry which flourished in the north of France. The *pastourelle* is the daintily told story of three characters: the country maiden, tending the sheep, and her two wooers, the knightly cavalier and the country swain. Marion the maiden generally remains true to Robin, the swain, although she is sometimes represented as fickle, and easily persuaded by the charms and polished tongue of the gentlemanly stranger. In the later Middle Ages this variety of lyric poetry seems to have disappeared, having been superseded by more artificial forms, such as the *Rondeau*, etc., and so it would be difficult to establish any bond of filiation between it and the literature of the Renaissance period. Consequently we pass it by, though we are not to forget that some recollection of it in the popular mind may have made the Renaissance pastoral grow more readily and lustily.

The earliest sample of the later pastoral is found in the literature of Italy: the *Favola di Orfeo* of Poliziano, performed at the court of Mantua, in 1483, on the occasion of the return of a certain Cardinal to that city. It is a tiny play of a few hundred lines, although arranged in the traditional five acts, whose subject is the story of Orpheus. The next important book is the *Arcadia* of Sanazzaro, published in 1504. It consists of twelve eclogues (in verse) connected by prose interludes describing Arcadia and the occupations of the shepherds in that delightful land. The *Arcadia* of Sanazzaro is the earliest of the non-dramatic samples of the class. It was extremely popular. Sismondi, writing some eighty years ago, said that more than sixty editions of the book had existed. Three quarters of a century later, between 1578 and 1580, Sir Philip Sidney, in England, composed his *Arcadia* in honour of his sister, the Countess of Pembroke. It is a prose work, which might by courtesy be called a romance, were it not next to impossible to find a plot in it. The style, though disfigured by *conceits*, is vigorous, and the sentiments expressed are lofty. From this time on, the great books of the

class come thick and fast. Edmund Spenser published, in 1579, his *Shepherd's Calendar*, a series of twelve eclogues, corresponding to the twelve months of the year, in which we learn of the loves of the faithful shepherd Colin Clout and his friends, mingled with curious satires on church and state. Two years after, in 1581, the great Italian poet, Tasso, published his pastoral play, *Aminta*, a charming poem whose locus is set in Italy and not in Arcadia. Four years later another Italian poet, Guarini, produced another of the same class, the celebrated *Il Pastor Fido*, whose scene is in Arcadia, and whose plot is a piece of pseudo-mythology. The Arcadians have been under the obligation of sacrificing a maiden once a year to Diana their goddess, from which penalty they will be relieved when Love shall join two of race divine, and the lofty piety of a Faithful Shepherd shall amend the error of an unfaithful lady. It is a play of five acts, interspersed with choruses. In the same year, 1585, appeared another piece of pastoral composition in Spain by Cervantes, the celebrated author of *Don Quixote*. It bears the name of *Galatea*, and is in the form of a romance in prose, interspersed with numerous short pieces of verse. It is said to be characterised by the same defect as disfigures Sidney's *Arcadia* and D'Urfé's *Astrée*, that is complicated plot. It had great popularity, and as late as the eighteenth century was imitated by Florian in France. The fact that *Galatea* was written by the author of *Don Quixote* is most significant. It shows that he, the writer of that great satire on artificial romances, did not regard the pastoral form as worthy of the contempt he poured on the heroic form of romance. It proves that pastoral literature was accepted by the universal consent of the age.

Twenty-five years later (1610) D'Urfé published his *Astrée*, which is more particularly the subject of this paper, and which I shall pass over for the present to return in a moment. Fifteen years later (1625) Racan, the friend of Malherbe, published his *Bergeries*, a dramatic poem in five acts, interspersed with choruses, of which the chief shepherdess is Artenice, which you may remember is the anagram of Catharine by which the Marquise de Rambouillet was known among the *habitués* of her salon. But time would fail to speak of all the pastorals of the period, or of the literature which bears evident marks of the influence exercised

by this movement. We shall pass by Ben Jonson's *Sad Shepherd* and Fletcher's *Faithful Shepherdess*, the latter published in the same year as *Astrée*, as well as such plays of Shakespeare as the *Midsommer Night's Dream* and *As You Like It*, and such pieces of Milton as *Lycidas* and *Comus*, where the influence of the pastorals is easily seen. Nor can we do more than mention the fact that the movement was not dead in the earlier part of the 18th century. Pope entered the field of literature in 1704 with his *Pastorals*, four short poems on the four seasons, and the Scotch poet Allan Ramsay, in 1725, published his *Gentle Shepherd*, which was a popular poem for a century later. Enough has been said to show that the type of literature to which the subject of our paper belongs was extremely popular, wide-spread and long-lived. It was, as we have seen, in all forms and styles: in prose and poetry, M. Jourdain's two classes of writings, sometimes lyric, sometimes romance, sometimes drama. In Italy, which was peculiarly its home, if it did not actually give birth to *opera* it at least proved a nursing mother to that important form of composition. In France the *Astrée* was the first of a long list of famous novels, which received a rude shock from Molière in his *Précieuses Ridicules*, but which continued to be read by many for a long time. Indeed the *Pastoral* was not fully dead till Jean-Jacques Rousseau gave the spirit which animated it a new form in the sentimental novel which flourished in the end of the 18th and the beginning of the 19th century. It was the same love of nature expressed in a new way.

But *Astrée* is our special subject at present. Let us return to it. Its author is Honoré d'Urfé, marquis de Verrome, comte de Châteaufneu, baron de Château-Morand and chevalier de l'ordre de Savoie, who was born at Marseilles in 1568, and passed his youth in Forez, in the vicinity of Lyons, on the banks of a stream called the Lignou, a tributary of the Loire. Monsieur d'Urfé cast in his lot with the Leaguers, and after their defeat by Henry IV, he retired to Chambéry, the capital of the Duchy of Savoy, and spent there the last 27 years of his life. He died in 1625 while engaged on a warlike expedition in Piedmont. The first and second parts of the book are dedicated to Henri IV and were published but a short time before the assassination of that monarch. The third volume is dedicated to Louis XIII, and was published in 1818,

eight years after the first and second. The fourth volume is dedicated to Marie de Médicis, mother of Louis XIII, and was published in 1627, two years after the death of the author, by his secretary, Balthazar Baro, who informs us that, having been left the literary executor of his master, he publishes what remains of *Astrée*, in order that unprincipled persons shall be prevented from publishing clumsy imitations of the closing parts of the work, and thereby from bringing his master's name into disgrace. He informs us also that his master's plan was to write a *tragicomédie pastorale*, in five volumes, each containing twelve books, so that the work should resemble a play, each volume corresponding to an act and each book to a scene. In the same year he publishes the fifth part, and even a sixth and last part or conclusion. Several things surprise us in connection with the book. First, seventeen years elapsed between the time of the beginning and the completion of its publication; second, its great length, six thick volumes containing no fewer than 6315 pages; and third, that in spite of these things and in spite of the wearisome, broken manner of developing the plot, people waited eagerly for the volumes to appear. But it was the period of long novels: we are told that one by La Calprenède ran up to twenty-three volumes, and those of Mlle de Scudéry, such as *Clélie* and *le Grand Cyrus*, were not much shorter.

The scene of the story is laid in Forez, on the banks of the Lignon, the locality in which D'Urfé spent his youth. The time is the fifth century of our era, a period when druids flourished—according to the story—as well as nymphs, and the gods of the Greeks and Romans, such as Pan and Diana. A curious mixture. The human beings are shepherds and shepherdesses, who have retired from the busy, noisy world to contemplate the beauties of nature, to meditate on many of the intricate problems which present themselves to human minds, particularly those in which Cupid plays a large role, and to write and speak their sentiments on these points in elegant prose and verse, and at great length, whilst they tended their peaceful flocks. Céladon is a shepherd and Astrée is a shepherdess, who have had an affection for each other from an early age. Some wicked person sows the seeds of suspicion in Astrée's mind, whereupon she shows a coldness towards Céladon, at which he is so much aggrieved that he casts

himself into the Lignon. Astrée, hearing of his rash deed, casts herself into the same stream. But neither of them is drowned. Astrée is rescued by some shepherds and taken to the cabin of her cousin, Phillis, while Céladon is rescued by three nymphs, and nursed back to health by the same kind ladies, two of whom fall in love with him. But he remains true to his shepherdess, and after his convalescence, he retires to a cavern in the wood, where he passes the days in sighing out verses, or in engraving Astrée's name on the bark of the trees. Meantime Astrée has become convinced of Céladon's fidelity, and her affection for him has returned, but she cannot bring herself to confess the change. So the expedient is invented of disguising Céladon as a young shepherdess, and of thus introducing him into intimate relations with Astrée. Astrée is charmed with this new friend, but when she discovers the fraud she is very indignant, and the last state of Céladon, poor fellow, appears worse than the first. Fortunately war breaks out in the country and Céladon quits his shepherd's crook for the soldier's lance. He distinguishes himself, and thinks that because he has distinguished himself he may aspire to Astrée's hand, but she repulses him again. Then he determines to drown himself in downright earnest. He proceeds to a fountain, the fountain of truth, to which Astrée has also proceeded, and there such wonders are wrought as in the end bring about their reconciliation. The story closes with the account of their marriage, and of that of several secondary characters. Such is the tiny stream of plot which runs in and out amongst the thick growth of dissertation, of subsidiary stories, of letters, of madrigals and sonnets, which go to make up the bulk of the 6000 pages. And this book was popular! We have difficulty in believing it, and yet the proofs abound. In the fifth volume of our copy of *Astrée* is printed a letter sent to D'Urfé from an academy of a couple of score or more of true lovers, knights and ladies of the highest rank in Germany, who have adopted as their own the names of the characters in *Astrée*. They beseech the author to continue the publication of the delightful book as rapidly as possible. He replies that as soon as the noise of the cannons shall cease, he will take pen in hand to give repose to the desires of his shepherds. He did not live to redeem his promise. Besides this very striking proof of the popular-

ity of the book, we have the homage that was paid to it by such writers as La Calprenède and Mlle de Scudéry, who wrote long romances in imitation of it. It is on record, also, that such austere persons as Saint François de Sales and Bossuet admired the book. Even Boileau, who was so severe a critic, had words of praise for it. And Jean-Jacques Rousseau relates that, when he was at Lyons on one occasion, he wished to go to see the banks of the Lignon and find some trace of the fair shepherdesses described by D'Urfé. Nor is this popularity inexplicable. Men and women read *Astrée* because it appealed strongly to their sentiments. It created an ideal world which they regarded as a model to aspire to in the arrangement of the real world around them. The year 1610, the date of its publication, is the very moment when the celebrated Marquise de Rambouillet withdrew from the court on account of the rudeness which she found to prevail there, and founded her *salon* which was to be the *rendez-vous* of poets, orators and *beaux-esprits* for the succeeding half a century. The beautiful disquisitions, madrigals and sonnets which fill many a page of the *Astrée* were the exact counterparts of the conversations held, and the pieces of poetry read, in the *chambre bleue* of the Hôtel de Rambouillet. A wave of sentiment which tended to produce polite, dignified, ceremonious speech and action had swept over France, and *Astrée* was but the voicing of what was in the hearts of the leaders of society. The language and manners of the rude soldiers of the camps of the civil wars were to be replaced by those of the refined ladies and gentlemen of the court and of the *salons*. A new ideal was being developed and *Astrée* was the expression of it. Hence the popularity of the work. But in spite of this popularity, *Astrée* has long been dead, and it requires a large amount of perseverance and energy to read those pages which once gave exquisite delight to so many delicate and cultured minds.

Why should a book, so highly esteemed by one generation, become so unreadable to another? And, on the other hand, we may ask, why should a book, held in no esteem in the generation to which it belongs, become, as is often the case, of great importance to succeeding generations? No one comprehensive answer can be given to these questions, such as Taine attempts in Part V of his *Philosophie de l'Art*. The sacred scriptures of all civilizations live because they appeal

to the belief that they are divine. Many ancient books live because of the schoolmaster and critic,—who is a variety of schoolmaster. It is wrong to suppose that to place a book on a curriculum of study is to kill it. A school programme is a veritable Valhalla of literature. I venture the assertion that every old man loves better the pieces of literature he read as a boy or young man in school or college than any other. In this we see one function of schools, viz., the keeping alive of the great books and great thoughts of the past. No one thing needs to be so impressed on the minds of radical youth, as that the present has its roots in the past, has grown up out of the past, is indissolubly bound to the past, that there can be no proper understanding of the present if we are ignorant of the past. One important element conducing to longevity in books is humour. What life there is in Rabelais is due to his rollicking fun. His coarseness has also helped him considerably, as it has many another writer. Pithiness of expression is of great service also in keeping books alive. The sententious writers, like Montaigne, have a great advantage in the struggle for ascendancy. Conciseness of form, such as we find in the lyric, keeps work from being forgotten. A person of our day likes a well told story, and certainly a well managed plot is a great aid to long life. But we must not forget that many long-lived books have had poor plots. Indeed plot seems to be particularly a nineteenth century revival of one of the features of mediævalism. Mediæval plots are for the most part badly managed, but they are there, and had their effect on the naïf readers and listeners of the Middle Ages. The plot in classical times is frequently well managed, but it appears at all times to be subsidiary. Classical writers seemed to value such things as elegance of style, sententiousness of expression and analysis of character so highly that excellence of plot was overlooked. Molière is particularly careless about intrigue. Racine and Corneille paid more attention to it, but in their tragedies there is not much appeal to the feeling of curiosity, for all their plots were the old, well-worn ones of Greek and Roman history and mythology. La Fontaine tells many charming stories, but polish, felicity of expression and satire are what he desired to excel in. Classicism seems to have regarded mere story-telling as childish and unworthy of its best efforts. An interesting confirmation of this is seen in the volume, in our library, bearing

the date of 1582, whose title is, "Trésor de tous les livres d'Amadis de Gaule." Amadis de Gaule was one of the so-called *Romans d'Aventure*, composed in the first place in Portugal, in the 14th century, in imitation of the Celtic Romances which flourished at an earlier period in France. It was then translated into Spanish, and later, in 1540, into French by Herberay des Essarts. It is generally considered as one of the models followed by D'Urfé in the composition of *Astrée*. It was, like *Astrée*, of very great length, and an accommodating bookmaker conceived the idea of putting the most interesting parts of it into concise form for busy readers. But he did not give a synopsis of the story as we might expect; he picked out what he calls the "harangues, epistres, lettres missives, sentences, cartels, complaintes et autres choses, les plus excellentes, pour instruire la jeune noblesse française à l'éloquence, grâce, vertu et générosité," of which he finds enough to fill a thick book of 700 pages. We see, then, that plot was a secondary matter. No doubt a well told plot would have been an advantage, but no advantage came to *Astrée* from such a source: nor does it have the advantage of humour, much less does it derive any from brevity. The only wonderful thing about it to us is, not that it died, but that it lived as long as it did. Its strong qualities were tenderness of sentiment, loftiness of ideal and dignity of expression, and these things appealed so strongly to courtly readers that its defects were overlooked. But as time went on, the number of persons outside of courts, who took an interest in books, constantly increased, and as they increased, the demand grew for other sorts of reading material. The elegant discussion of nice points in matters of ceremony and good manners appealed less and less strongly to the newer classes of readers. So the field was widened. The new topics claimed more and more attention, and even the courtly readers in time grew tired of what had been written for them, preferring the discussion of those topics about which the majority of men were most deeply concerned. Then, the faults of such books as *Astrée* became very evident, and they died. But it is often good for us to stand by the graves of those who have finished their career, even if for no other reason than that it reminds us that we too, and all our works, may lie in as forgotten graves as those of D'Urfé and his *Astrée*. How many contemporary books will have as long and honourable a history as even poor *Astrée* had?

SOME PHASES OF ALTRURIA.

BY R. H. COATS, '96.

[Read before the Classical Association.]

“For all the law is fulfilled in one word, even in this: Thou shalt love thy neighbour as thyself.”—*Gal. v. 14.*

THE appearance, a few months since, of Dr. Drummond's “The Ascent of Man” has given, if possible, an increased importance to the scientific, and hence to the ethical, position of altruism. Altruism, otherism, love, has been proclaimed the neglected and missing factor in current theories of evolution. The “struggle for existence,” the other, and in current theories the only, factor, is not ignored; but its consistency with an infinite love is strongly asserted. In fact, its importance is lessened only in that it has ceased to be regarded as the sole and vivifying principle of change, and has been relegated to the but slightly inferior position of the *vis a tergo*—the steady pressure of which maintains living organisms in motion.

The ethical significance of this elevation of altruism as an agent in science cannot be exaggerated. To acknowledge with Mr. Huxley that nature is immoral, and thereby to admit that our ethical doctrines may be at variance with the laws of nature, is to confound our reason by admitting a distinction between what is natural and what is right. By Dr. Drummond's theory this and many other difficulties of a similar nature are obviated. Individualism can no longer boast over coöperation that it is the only law that nature recognizes. “Evolutionary ethics” is no longer a contradiction in terms. Even Mr. Herbert Spencer recognizes the primordial *equality of self-sacrifice and self-preservation, though he finds a rule of conduct in a †*compromise* between the maxims “Live for self” and “Live for others.” In brief, Dr. Drummond's book has rendered impossible the revival

* *Data of Ethics*, xii. † *Ibid.*

of a view so extreme as that "Morality is coextensive with self-interest," which was that of a writer of comparatively recent date.* Altruism, it would seem, is about to receive a new significance in the history of man's development, physical and moral.

The conception of altruism as an ethical ideal is at least as old as the Mosaic dispensation (Lev. xix. 18). It has been a guiding-star of law-givers and moral philosophers ever since, with the possible exception of Epicurus and his modern utilitarian representatives. Ever shrouded by idealists in mists of allegory—so objectionable to the old farmer of Mr. Howell's romance,† who knows all about "Ameriky" and wants to get to "Altrury"—seen only down vistas of an impossible perfection, Altruria, this land of total abnegation of self, "bounded on all sides by mountains of philanthropy and by oceans of loving-kindness," where men love their neighbours as themselves, and where sometimes women vote—this Altruria, the object of unceasing search, was never seen concretely save once since the world began. .

It has been our endeavour in the following pages to treat, necessarily with brevity, a few of the leading attempts to sketch this happy country—a few of the most important guesses at the truth concerning the ideal state (for, as we shall see, an exalted altruism is, as a rule, the leading characteristic, if not the necessary basis, of these), and to show thereby, with, we hope, a pardonable superficiality, the evolution of men's ideals on some of the various subjects that have at all times engaged their attention. For idealists stand upon a footing of relative and not of absolute equality. They must inevitably reflect the circumstances, both of time and place, under which they think and write. Sir Thomas More mirrors the sixteenth as Mr. Morris and Mr. Bellamy reflect the nineteenth century, and as Plato the fourth century B.C. The world has advanced in its ideas during its progress from Plato to Bellamy. It would be strange if it did not manifest a corresponding advance in its ideals.

And here an important distinction must be pointed out between mere Utopias and those essays or treatises, etc., which discuss the regeneration of society on its existing basis, such as the political writings of Jeremy Bentham, James Mill, Herbert

* "Individualism," W. Donisthorpe. † "A Traveller from Altruria," chap xi.

Spencer and Henry George, among English writers, and of Rousseau and his disciples in France. The *Republic* of Plato is the great prototype of the former, the *Politics* of Aristotle* of the latter. To distinguish between the two is not always easy. The *Oceana* of the unfortunate Harrington, for example—a hard, prolix, heavy exposition, elaborated with infinite care, and containing, in spite of its irretrievable dulness, many valuable ideas—is lacking the spirit, while it maintains the form, of an Utopia. Hence, though pronounced by Hume “the only valuable model of a commonwealth,” it has been disregarded in the present survey. We shall confine our attention, in the case of the few works mentioned below, to what may be called purely philosophical romances.

It is difficult to understand how a Greek who worshipped intellect rather than morality, and to whom the disinterestedly-good man was a fool, can ever have conceived of a constitution based upon altruistic principles. Nevertheless, whether the model of Hippodamus, of Bryson, or of Archytas of Tarentum, or whether the systems of Lycurgus or of Pythagoras suggested the *Republic* of Plato, or whether it was evolved out of the political agitations of that stormy decade which ushered in the fourth century B.C., in which the pupil of Socrates cannot but have been involved; whether it seeks primarily to define the perfect *πολιτεία*, or whether it is simply and essentially an enquiry *περὶ δικαιοσύνης*, or whether, Janus-like, its two titles are but two faces of the same truth; the poet-philosopher who conceived it had proved conclusively to himself that the governors of the perfect commonwealth must be actuated by a different principle than that of his contemporaries—a principle which he embodied in all its then startling originality in the persons of his wifeless, childless, homeless, altruistic guardians.

The *Republic* is but part of a larger design. With the *Timæus* and *Critias* it was to have formed a trio exhibiting the historic ideal state in actual working, and embodying a physical as well as a political philosophy. We will not attempt a résumé of this masterpiece of thought and composition. Without stopping to notice the very dramatic setting of the dialogue, or the characters

* Or, perhaps, Plato in his “Book of Laws.”

so eminently Platonic, philosophic, and picturesque, we merely draw attention to its real and Platonic divisions as follows: First, the discussion of justice, which, after being *more Platonic*, defined, re-defined, caricatured, and finally, lost to view in a mist of abstractions, reappears unexpectedly in the first ideal (Hellenic) state of Socrates. Books V, VI, VII, set forth the higher conception of a state enjoying community of property and of wives, government by philosophers and a perfected educational system. There follows a treatise on the perversion of states into tyrannies, and in Book X, and the fifth division, the subject again changes to the old battle of the poets and philosophers.

What is right? is the question running through the entire *Republic*, and serving to unite what on the face of it is an imperfect whole. This, Plato, the idealist, who is also a man of action, answers, not by barren cut-and-dried philosophical formulae, but by showing us first a city of men that is exalted and transfigured into a city of God.

In the state of the *Republic* the classes are three in number, the rulers, the guards, and the artisans, answering to the division of the soul into the rational, spiritual, and concupiscent elements. And as the harmonious interaction of the latter constitutes temperance (*σωφροσύνη*) in the soul, so the coöperation of the former without friction is justice in the perfect state. Plato is reticent in regard to the first and the third classes. The latter, it would seem, is very similar to the corresponding class in actual commonwealths. Those of their children who show conspicuous ability are to be transferred to the class of guards, as the class of rulers takes its recruits from the class below it; for we sometimes find, says Plato, that a golden father has an iron son.

The class of guards is the bulwark of the state both against foreign invasion and domestic sedition. They are to be absolutely without property. Their wives are to be wives of no one in particular, but of the whole class. All the children likewise belong to all; and thus the great causes of disunion in a state—the home life—is to be obliterated.

Thus courageously are problems which time has been unable to unravel even yet grappled with, and a solution attempted. The science of psychology is founded. The much-disputed relation of right to utility is discussed. It is unfortunate that the por-

tions where Plato rises to the very "summit of speculation" are the most unsatisfactory to the modern reader. For as yet logic is clouded in metaphysics. The doctrine of the syllogism had to await the practical hand of Aristotle. Dr. Quincey has drawn attention to the numerous fallacies of Plato, often purely verbal, but none the less material and misleading. He instances the tabooing of the poets, while polygamy and infanticide are deliberately adopted as the basis of his diabolical economy, as purely verbal chimeras.

Is the *Republic* a mere dream, or did the great idealist think it capable of realization? Yes and no. The ideal Hellenic state Plato doubtless conceived as a possibility; but the kingdom of philosophy was, perhaps, nothing more than a dream, which Aristotle, however, seems to take seriously.

The other Utopia of Classical Literature (if we omit the work of Xenophon) is scarcely worthy of mention. The *De Republica* of Cicero—"a singular mongrel compound of history and philosophy," valuable neither as the one nor as the other, holds up the Roman constitution as in the main the ideal government sought by philosophers. The form of government advocated, however, is neither democratic nor monarchical but a mixture. Following Plato he banishes the poets. The vision of *Er* is in Cicero the very inferior *somnium Scipionis*, while the historical side is borrowed from the *Critias*. Greek in everything but its local colouring and the sturdy independence of the Roman, Cicero's Republic enjoyed, notwithstanding its obvious lack of originality, much popular admiration. But the idea is commonplace, and the execution clumsy and inferior. We can read between the lines in Tacitus the same mistaken idealization of Roman republicanism of the high and palmy days.

Coming to mediæval times we find here two great ideals—the *Civitas Dei* of St. Augustine, and the *De Monarchia* of Dante, both remarkable works for a multitude of reasons. Though separated as to date by a space of nine hundred years, they are in two cardinal features very similar. Both are full of the reverence begotten of the near and mighty influence of the Empire of Rome; both are eloquent polemics for the ethics of Christianity. We might add perhaps that both are in a parti-

cularly eminent degree the natural and congenial productions of their age.

The work of St. Augustine is an elaborate, uncritical, parallel of the kingdom of God, as exemplified by Jewish history, and the kingdoms of the world as seen in the histories of the various Gentile nations. Both are pursued into an ideal future. Designed primarily as a vindication of the Christian church, which was at that time rising as a new order from the ruins of the Western Empire, it is really, in spite of its curious intermixture of theology, the first conscious attempt towards a philosophy of history, an attempt which Buckle, usually so comprehensive, conspicuously fails to appreciate.*

The *De Monarchia* (1310-1313) is the work of a violent Ghibbeline and at the same time an ardent Christian of the mediæval type. It proposes a new Universal Roman Empire, entirely distinct from the old;—Roman, because both St. Paul and Christ acknowledged the Caesar's claim to rule—universal, because of a curious medley of logical, theological, and analogical reasons. It dwells most eloquently on the misery of mankind, crying earnestly for reform.

Sir Thomas More's *Utopia* (*οὐτόπια*—or *Nusquama* as he sometimes calls it) is the work of a scholar of middle age on whom the *Republic* of Plato, and the newly-interpreted literature of the New Testament, had produced an ineffaceable impression. It is pregnant with the rapidly approaching Reformation. The adjective "Utopian" is applied now-a-days to things impracticable, but the work of Sir Thomas More is intensely earnest and abounding in practical suggestions.

The *Utopia* opens with a sad account of England, not yet recovered from the frightful demoralization of Yorkist and Lancastrian strife, cursed too with a corrupt clergy and a selfish nobility. Side by side with this state of misery and oppression he has placed his Utopia, where—mere palliatives for the evils of property being no longer applied—the disease is remedied by the entire removal of its cause.

In his crescent island artificially severed from the mainland, there is a capital city, Amaurot, and fifty-four similar towns,

* See Buckle's "Civilization in England," chapter vi., On the Origin of History.

each capable of accommodating six thousand families. Farm houses calculated for forty persons dot the intervening spaces, for agriculture is held in great esteem. They have an excellent system of markets and magazines. An intense spirit of communism is all-pervading, being carried to such lengths as the institution of a public mess similar to the Spartan *sysitia*. Even their nurseries are public establishments; while the number of children in separate families is equalized by taking the excess from one and conferring it on another.

The government is quite simple. Every thirty families chose a magistrate, a *Philarch* as he is called; every ten such divisions chose a superior magistrate called an *Archphilarch*; and a prince is elected by the inferior magistrates out of four candidates nominated by the people. Every town sends three representatives to a legislative council which meets at *Amaurot*. The chief and almost the only duty of the magistrates is "to see and take heed, that no man sit idle." Yet the citizens are "not to be wearied from early in the morning to late in the evening with continual work, like labouring and toiling beasts," for the working-day in *Utopia* is only six hours long.

Even in the above few details may be recognized some of the difficulties combatted with similar weapons by modern Socialism. Sir Thomas More, nearly five centuries ago, saw with true prophetic vision the course which coming changes would pursue.

The "*Utopia*" is a monument of consummate art. Like Socrates, More could invent "*Egyptians* or anything," and no one since Plato, has framed a nobler lie than his "*Utopia*." By the employment of a nicety of precision, by the confused intermingling of the real with the imaginary, he has conferred a reality on his creation never surpassed by writer of fiction.

But the originality of his conception is quite as praiseworthy as is his admirable art. His tolerance in matters of religious belief is as pleasing as it is unprecedented. His political and moral speculations show a corresponding advance upon his contemporaries. War he regards as a horror. He detests priests and lawyers. "They (the *Utopians*) have priests of exceeding holiness, and therefore very few" he remarks satirically. Again, in speaking of his own age, he says: "Preachers, sly and wilie

men . . . because they saw men evil-willing to frame their manners to Christ's rule, they have wrested and wried his doctrine, and like a rule of lead have applied it to men's manners: that by some means at the least way they might agree together." As for the lawyers, "which craftily handle matters, and subtely dispute of the laws . . . they think it most meet that every man should plead his own matter, and tell the same tale before the judge that he would tell to his man of law." In numerous other matters, *e.g.*, his ethical conception of happiness, he exhibits a truly modern spirit. He has a genuine contempt for governments and princes, who are made the butt of Raphael Hythloday's especial satire.

Perhaps no better way of illustrating the main characteristics of a work can be adopted than to quote *verbatim* a few sentences. But the space which would be required to furnish even a most inadequate idea of More's masterpiece renders it impossible in this instance. Indeed no mere selection of quotations, however liberal, could convey any real conception of the exceeding fertility of More's genius, or exemplify the naive yet forcible expression and the fearless political wisdom of his ideal. The Utopia is a work not of yesterday, or to-day, but of all time. Few men have read the signs of the times as critically, and few, we may add, have set about the work of social reform in a more enlightened spirit. As to the practicability of his scheme, More himself seems to have entertained a doubt. "I must needs confess and grant that many things be in the Utopian commonwealth which in our cities I may rather wish for, than hope after," are his concluding words.

The *New Atlantis* of Bacon, though fragmentary and vastly inferior to the *chef d'œuvre* of More, has an importance of its own. The Socrates of physical science has unveiled to us a world wherein the huge and complex congeries of phenomena, which was his conception of nature, studied experimentally, raised to its noblest height the lives of men. The importance which it derives from being the only work of imagination from the pen of the founder of modern philosophy, need not concern us here.

Bacon's island differs characteristically from More's. The people of Beusalem are Christians and Physicists. The

Utopians are neither. The *New Atlantis* is only secondarily a work on moral and political philosophy. The Society of Salomon's House is the only serious attempt to sketch a political ideal. In fact the country is primarily a great physical laboratory. "The end of our foundation," the father of Salomon's House declares, "is the knowledge of causes and secret motions of things." Their "preparations and instruments" are those of physicists, and the functions of the Fellows of the House are those of physical experimentalists. But it has one figure that is admirable for other reasons. "No reader of the 'New Atlantis'" says Arnold, "can fail to be struck by the religious light in which the venerable Father of Salomon's House is regarded. He is no mere student or specialist; he is a benefactor of the human race, a father of his country, a mediator between man and the Laws of God, 'having an aspect as one that pities men;' not a rhetorician or preaching prelate but a Priest of science blessing the people with outstretched hand 'in silence amid the spontaneous veneration of his countrymen.'"

Thus the *New Atlantis* is *par excellence* the Utopia of experimental, physical, and mechanical science. It is inspired by the *Timæus* rather than the *Republic*. But as a work of art it is marred by a mixture of classical and oriental styles. It is in Bacon, however, that we first find the aerial and submarine navigation, the mechanical automata, etc., or their representatives that fill the dreams of modern Utopians.

Tomaso Campanella (1568-1639), one of the most brilliant productions of the Italian Renaissance, was a philosopher and man of genius, and was also a persecuted Dominican friar. This is the key to the understanding of the *Civitas Solis*, an ideal nearly synchronous with the *New Atlantis* but in all its main characteristics a distinct return to the mediæval type. "The monastery is the type of the social organism he extols; the pontifical power and the ecclesiastical hierarchy serve as the basis of the government of his new society." The practical reforms he proposes are extreme. The magistrates are all to be philosophers, following Plato's celebrated words—that until philosophers are kings, or the kings and princes of this world have the spirit and power of philosophy, cities will never cease from evil.

His chief magistrate is significantly called Hot—*i. e.*, metaphysics,—and his chief ministers are Power, Wisdom, and Love, to rule respectively over war, science, and industry. Auricular confession and a system of perpetual prayer are state institutions ancillary only to the actual government.

That the member of a religious order should desire a religious autocrat for his Utopia is natural. But his union of two powers so contrary to Catholic doctrine, his doctrine of marriage so un-Christian, and the modicum of freedom provided for his republic, when he suffered so much from despotism himself, make him a rare specimen in the history of philosophers.

We now approach a period in English history singularly productive of writings of this kind. The bitterness of parliamentary strife, which formed the fitting prelude to a civil war, and the overthrow of royalty in blood; the brief democracy of an almost ascetic puritanism; the restoration of a monarchy which ran to the other extreme of license and absolutism; the crash of the revolution, followed by the stormy first years of William's rule; set men thinking seriously about first principles. As may be inferred, however, the resulting Utopias were of the practical rather than the imaginative type. Thus the *Oceana* before mentioned contains a proposed reconstitution of the government of England. The *Argenis* of Barclay is merely an allegory of contemporary history. The single exception is to be found in the *Monarchy of Man*, written by Sir John Eliot, in which the pure influence of the father of idealism once more reasserts itself. To the historian, these works are of interest as exhibiting the new spirit of scepticism which, being first carried into philosophy by Bacon, was afterwards enforced in theology by Chillingworth, Hales, and Owen; in metaphysics, by Hobbes and Glanvil; in politics, by Cromwell; and in the theory of government, by Sydney and Locke, in addition to those mentioned.

To be continued.

THE DEVELOPMENT OF THE SCIENCE OF
MINERALOGY.

BY WILLIAM A. PARKS, B.A.

[An address delivered before the Natural Science Association, October, 1895.]

THE words "science" and "knowledge" are not generally used synonymously, but we shall find it advantageous to do so in the present instance and to date the birth of the science from the time when the first knowledge of it was evinced. This must have been at a very early time, when man in his primeval state, with a dawning intelligence, was brought into contact with nature and the study of "Natural Science" began.

The first man laid the foundation of the science when he accidentally discovered the "hardness" of granite by personal contact and became acquainted with the "streak" of chalk in possibly the same manner, and that he was not backward in taking advantage of his experience is proved by the progressive development marked in the two prehistoric ages; when mankind invented the crude instruments of stone, characteristic of the Palaeolithic period and advanced into the better workmanship and more highly ornamental design of the Neolithic age.

Egyptian hieroglyphics, cuneiform inscriptions and all the means of perpetuating knowledge possessed by the ancients prove that by sheer force of necessity the treatment of the various minerals rose to an art of considerable importance, and we find from the sacred writings that previous to the deluge copper and iron were known and that the Hebrews were also acquainted with gold, silver, tin, lead, marble, alabaster, lime, flint, brimstone, amber, vermilion, nitre and salt, in addition to numerous precious stones. Probably the oldest piece of profane literature bearing on the subject is a poem of eight hundred Greek hexameters, ascribed to Orpheus, and dealing with the properties of about thirty mineral substances, but mixed, as might be expected, with

certain medical and ghostly superstitions regarding the power of preventing disease, curing snake bites and propitiating the ill-will of beings, both celestial and terrestrial. In addition to this, we find that Dioscorides deals with many mineral substances in his "Materia Medica," and that frequent mention is made of such materials by numerous poets, geographers and historians of antiquity.

Theophrastus, a disciple of Plato and Aristotle, has left us a short work devoted entirely to the subject wherein some of the substances known to him are classified according to their various properties in a truly philosophical manner, considering that their crystalline form was entirely disregarded and their chemical constitution utterly unknown. His basis of classification is the power of minerals to do something or to be themselves affected by other things: thus, the emerald gives its color to water in which it is immersed, and the magnet has an attractive force. He also divides minerals into fusible and infusible, combustible and non-combustible, etc. That more advance was not made by the Greeks is doubtless owing to the system of philosophy to which they were devoted, a system by which all problems are to be solved by the force of mind alone, and exterior objects are to be shut out that they may not hamper the pure workings of the unaided reason. It is reported of a certain philosopher that he destroyed his eyesight in order that his mind might not be contaminated by the observation of the gross materials of nature.

By far the most important writer of antiquity connected with our subject was Pliny the Elder, who devoted the last five books of his work on nature to the consideration of minerals, which he treats in a rambling manner, mingling much valuable information with the usual accompaniment of fable and superstition. Even he does not pretend to mention all the substances known to him, and he goes so far as to say that so many new minerals were being discovered every day that it was impossible to keep apace with the advance, thus proving that the spirit of investigation was not dead among the palaces of Rome, indeed, those very palaces are lasting monuments of the deep interest taken in our subject.

Confining our attention for a time to the Greek and the Roman periods, let us endeavor to form a conception of their

knowledge by investigating their information concerning a few substances, it being manifestly impossible in a paper of limited length to even mention all the minerals known to them. Among the metals they were familiar with gold, silver, copper, iron, lead, antimony and mercury, possibly also with zinc, arsenic and bismuth. Copper being the most important of these, we will review it in some detail. The oft-mentioned Tubal Cain was, we are told, an instructor of every artificer in brass and iron, and Æschylus makes Prometheus boast of having taught the use of iron to man; but copper, because it occurs native, must necessarily have been known before iron and history points out that the brazen age preceded the age of the harder metal.

According to Werner, copper was the first metal known to the ancients, and the terms "brass" and "bronze" were used indiscriminately, whether the alloys were produced artificially or resulted from the reduction of mixed ores.

In the most remote antiquity pure copper was probably more common than any of its alloys, for Homer states that the spear of Iphidamos turned on striking the girdle of Agemennon "as though it were lead." This would scarcely happen with the harder alloys, though it might be perfectly true regarding copper.

Pure copper Pliny calls *æs Cyprium*, and that he was familiar with many of the alloys is proved by the following recipe for the manufacture of statuary bronze: "Add to melted copper one third part of old brass worn and polished by use (*æs collectaneum*) with twelve and one-half per cent. of *plumbum argentarium* (an alloy of equal parts of tin and lead)." A famous light-coloured brass, highly valued, was made by melting a certain earth, called by Pliny *cadmia*, with the copper, and Aristotle says that the Mosynœcians anciently prepared brass by this method; the earth referred to was doubtless calamine, though the ancients appear to have had little or no acquaintance with zinc in the metallic state.

The uses of brass and copper were so numerous that it would be difficult to mention them; however, the following may be considered typical examples: mechanics' tools, implements of warfare and agriculture, ornamental and useful articles of household furniture, money, statues, doors, columns, and even roofs.

The nature of chemical transformation was, of course, unknown, as is well shown by the name *argentum vivum* given to native mercury, while the metal produced by reducing cinnabar was called hydrargyrum, which was considered by Pliny as a spurious invention and a fraudulent substitute for the real article.

Pliny speaks of many mineral pigments which he divides into two classes: 1st, *floridi*, including the bright coloured pigments, as minium, armenium, cinnabar, indicum, purpurissum. 2nd, *austeri*—as sinopsis, rubrica prætonium, malinum, eretria and auripigmentum. Minium was doubtless cinnabar, the red sulphide of mercury, and not the substance now called by that name. This material was highly valued and even held sacred, being used in painting statues of the gods; in Pliny's time it was almost exclusively brought from Spain, as much as 10,000 pounds being annually sent under seal to Rome. Chrysocolla probably included various green minerals, such as malachite, green earth, copper green, etc., perhaps including also our chrysocolla, a name meaning gold glue, and originally applied to a mixture used by goldsmiths for soldering.

The blue carbonate of copper, azurite, was known as cerulaeum, a name also applied to various other blue pigments.

An interesting material was orpiment, the yellow sulphide of arsenic, called auripigmentum by the Romans, not only because it presented the colour of gold but because it was supposed to actually contain that metal. We are further told by Pliny that Caius (Caligna) succeeded in obtaining gold from it, but in very small quantities. We have no reason to doubt this statement, as the mineral in question is known to sometimes carry gold. Our term "orpiment," is evidently derived from auripigmentum.

During the craze for luxurious building, in the days of Roman ascendancy, the whole range of the known earth was ransacked for rare and beautiful materials to rear the magnificent palaces whose ruins yet remain. Blocks of enormous size were brought immense distances, marbles, polished serpentines, alabaster, malachite, rock crystal, granites and syenites, basalts and porphyrites. The hardest and most refractory substances were beautifully polished and engraved, being cemented by a

mixture of puzzaloni and lime, with the properties of which they were well acquainted, even to the making of hydraulic cement.

Among the salts, they were acquainted with many, the names of which are much confused; alumen, including alum, and many other astringent substances, such as copperas, etc. Nitrum was not our nitre but probably soda carbonate as borne out by many passages, such as its being used for washing and in making soap. Solomon says that "one who singeth songs to a heavy heart" is like pouring vinegar upon nitre. Now vinegar added to saltpetre produces no effect, but with soda carb. produces the effervescence which suggested the simile. The confusion of copper pyrites with iron pyrites is shown by the fact that the efflorescence known as sulphate of iron was called flos aris, copperas, which mistake has been handed down to the present day, the blue sulphate of copper not being known as copperas but that term being applied to the green sulphate of iron. In addition to these were known borax and sal ammoniac, besides numerous other materials used in medicine.

The Roman mineralogists were not ignorant of certain combustible substances, e. g., sulphur and bitumen, petroleum and asphalt. Liquid bitumen received the name of naphtha, and was used as a substitute for oil, sometimes being known as Sicilian oil, although Dioscorides remarks that it was not a true oil, their idea of oil evidently not admitting of a mineral origin. Amber was widely used and even mineral coal, this latter material being used by the smiths in various melting processes.

A substance known as Carpasian lace was employed as wicks in sacred lamps, from its property of not being itself consumed; this material was probably asbestos.

In the country called Magnesia were found two widely different materials, carbonate of magnesium and the magnetic oxide of iron, which both received the name of magnetic stone from the country of their occurrence. Pliny describes a magnet from this locality as whiteish in color and resembling pumice, and Theophrastus remarks of the magnet that it is silvery white and capable of being turned in the lathe. We have therefore the derivation of "magnet" as well as "magnesia," though the former came to be known as the Heracleean stone. The derivation of "magnet" from Magnes, a shepherd of Mount Ida, is discredited

by Dr. Moore, to whose work on the ancient minerals I am indebted for many notes on this part of the subject.

Pliny's last book is devoted to the consideration of a larger number of jewels, many of which would not now be classed as such, but when freed of fable his descriptions prove an acquaintance with many of their properties and his account of the nicety of workmanship fills us with admiration when we imagine goblets of pure quartz and statuettes of agate and jasper.

In the operations of mining they also show great persistence, and the excellence of their tools is attested by the fact that they drove galleries 8,000 feet long into a rock which Pliny describes as harder than flint, an operation which would be difficult to-day, without the use of high explosives.

During the decline and after the fall of the Roman Empire, we lose sight of our science as such until Lavoisier's investigations in the eighteenth century gave birth to the modern science of chemistry. Throughout these centuries mineralogical investigation, though not dead, was mingled with and made subordinate to the researches in the black art and the juggling of the alchemists. While I do not propose to follow the various stages in the development of alchemy; it will be necessary, to preserve the continuity of our subject, to briefly pass in review the leading points which led up to modern chemistry. Among the Greeks a few authors may be considered as touching on the subject, notably Heraclitus, Empedocles, Damocritus and Aristotle. The subject was in some manner kept alive, possibly by occasional contact with India, where a species of chemical knowledge has existed for ages, until the early part of the Christian era, when, as the "sacred art," it was much practised by the early Christians of Greece and Egypt, and Alexander of Aphrodisiac, is by some considered as the father of alchemy. When and how the science passed into the hands of the Moslems is not exactly known, but the fact remains that for many centuries it was practiced by the Arabs, notably among whom was Geber, who made nitric acid 500 years before Albertus Magnus.

It might be interesting to note that mineralogical work is known for certain to have been practised by these devotees to the black art, for the women of the east were accustomed to blacken their eyebrows with powdered stibnite. Now, the theory

was held that by mixing spirits with this substance a more potent liquor was obtained, and the Arabic expression for stibnite being *al kahala*, we thence derive our modern word alcohol.

From Arabia alchemy again drifted back to Europe, and had a renowned exponent in Albertus Magnus, whose most startling theory was that all substances were composed of mercury and sulphur in different proportions (1282). Lully (1235-1315) made nitric acid by distilling nitre and green vitriol. Danstin, a contemporary of Lully, made the division of natural substances into animal, vegetable, and mineral. In the thirteenth century the search for the philosopher's stone was prosecuted, which was supposed to cure metals of their maladies and thereby convert them into gold. This search grew to be such a rage that in 1404 gold making was declared a crime in England. Investigations in the occult science now proceeded with rapidity, and it will suffice to mention the names of Basil Valentine, Agrippa, Paracelsus, and even Newton, Boyle, Bacon, Van Helmont, and Bergmann, which brings us immediately in touch with modern science.

Taking a broad view of alchemy, it may be traced through three stages. It consisted of:—

- (1) A mixture of religion, medicine, and astrology, down to the 3rd and 4th centuries.
- (2) A mixture of astrology with scientific investigations into the nature of matter, and even included geology to the 16th century.
- (3) Became independent of astrology in the 16th century and remained so till its death.

That mineralogy was especially studied, and even many systems* of classification attempted through the dark ages, will be seen from the following extract from Dr. Thomson's *Mineralogy*, published at the close of last century:—"Avicenna, a writer of the 11th century, divided minerals into four classes, stones, salts, inflammable bodies, and metals. This division has, in some measure, been followed by all succeeding writers. Linnæus, indeed, the first of the moderns who published a system of mineralogy, being guided by external character alone, divided minerals into three classes, *Petræ*, *mineræ*, and *fossilia*; but Avicenna's classes appear among his orders." The same remark may be made with respect to the systems of Wallerius, Wolsterdorf, Cartheuser and

Justi, which appeared in succession after Linnaeus' *Systema Naturæ* in 1736. At last in 1758 the system of Cronstedt appeared. He reinstated the classes of Avicenna in their places, and his system was adopted by Bergmann, Kirwan, Werner, and the most celebrated mineralogists who have written since.

Modern science has been said to date from three great discoveries, the Copernician system, Torricellian vacuum, and Lavoisier's discovery of oxygen in 1760, which overthrew the theory of Stahl, the last alchemist. Previous to this important date, we have seen that much had been done to promote the science, notably Linnaeus' system based on the principle of genera and species, Werner's system based entirely on external characters, Cronstedt's system embracing both external and structural characters. The investigation of Bergmann, Gahn and Berzelius with the blowpipe, an instrument first used for minerals by Anthony Swab in 1738, laid the foundation of its scientific application to this work, and demonstrated its peculiar usefulness in mineral investigation. Cronstedt's work appeared in England under the title, "An Essay towards a system of mineralogy of Cronstedt, translated from the Swedish by Von Engenström, revised and corrected by Mendez da Costa, London, 1770." Bergmann's work appeared under the title, "De Tubo Ferruminatorio, ejusdemque usu in explorandis corporibus præsertim Mineralibus." It is to be regretted that Gahn has left no work on the subject, for he is described by Berzelius as a most indefatigable worker, and is said to have extracted copper from a quarter sheet of paper before it was known to occur in vegetable substances.

Before Lavoisier's time, therefore, mineralogical science was fairly well advanced, numerous classifications were employed, minute descriptions of external and structural properties were given, the blowpipe and the fluxes were diligently applied to any substance met with, and the results duly published. An idea of the method of classification used by Cronstedt may be gathered from an example of his method, thus:—

Order I. Simple stones.

“ II. Saline stones

“ III. Aggregates.

Order I., Simple stones.—Genera, (a) *Calcareæ*, (b) *Siliceæ*, (c) *Granatina*, (d) *Argillaceæ*, (e) *Micaceæ*, (f) *Fluores*, (g) *Esbestina*, (h) *Eulitheæ*, (i) *Magnesiæ*.

Bergmann in 1782 reduced the number of genera to five. Later writers as below: Silicious, Glucinous; Argillaceous, Magnesian, Calcareous, Barytic, Strontian. Thomson classified them as follows: Silica, Magnesia, Lime Barytes, Glucina, Zirconia, Yttria, Oxide of Iron, Oxide of Chromium, Oxide of Nickel, Potash. From this it will be seen that the earlier attempts at classification were based on the botanical principle of genera and species, and, as seen from Cromstedt's classification, the external and common physical characters formed the skeleton of the system. As these properties became more numerous, and as chemical structure became better known, the classes were reduced to a smaller number and were named after the first chemical substance present. This system naturally became cumbrous and uncertain as the knowledge of analysis increased till in its turn it had to be abandoned. A few examples will suffice to show the state of mineral chemistry in the early days of the science.

Emery was thus described: Emery disseminated through other fossils. G. 3-72; H. 14. Analysis, Si O_2 95.6. Iron 4.3.

Plumbago = Carburet of Iron.

Pure = 90% Carbon and 10% Iron, and many samples vary from this, as Vauquelin analyses a specimen with the result: 27% Carbon, 2% Iron, 38% Silicia and 33% Alumina. This is a rather startling result in the face of our present knowledge of the composition of plumbago.

Tennant in 1797 made the important statement that carbon and diamond were the same substance; but his statement was violently attacked by Dr. Thomson, who gives a remarkable proof that carbon is the oxide of diamond. The combustion of diamond is thus formulated:

Diamond 17.88 + Oxygen 82.12 = 28 Carbon and 72 Oxygen.

Diamond 17.88 + Oxygen 12.12 = 28 Carbon.

Therefore, charcoal = 63.83 diamond and 36.15 Oxygen.

Therefore charcoal is the oxide of diamond.

Perhaps the greatest credit is due to Margraff, of Berlin, whose attempts to apply the new principles of chemistry to mineral investigation were probably the first, and, though crude in themselves, led Bergmann and Scheele in the same direction, and their inaccuracies induced Klaproth to endless labor in this field, and to him and his noted successor, Vauquelin, all honor is due

for gradually bringing their results beyond the stage of approximation. A host of investigators now crowded into the mineral field anxious to apply the new science of Lavoisier in this direction. Notably may be mentioned, in addition to the preceding, Le Metherie, Berzelius, Haiiy and Kirwan.

Having given examples of chemical mineralogy at the close of the 18th century, let us inspect two or three cases in order to see the state of knowledge regarding mineral descriptions generally, thus:—

Leucite—Volcanic—primitive crystals, cubes or rhomboidal dedecahedrons, integral molecular tetrahedrons.

Texture—foliated, fracture chonchoidal.

Lustre 3, decomposed 0.

Transparency 3 to 2. H, 8 to 10.

S. G. 2.4648, colour white to gray.

Klaproth discovered potash in this mineral, and he gives the following analysis:—

Si O ₂	54	Al ² O ₃	23	K ₂ O	22
Modern—	55	"	23.5	"	21.5

Brown iron ore was considered a variety of red, and was not known to contain water, but had been remarked as giving a reaction for Manganese.

On entering the nineteenth century we have the science of mineralogy well founded and on a firm basis, established by long and careful investigation. As might be expected, it advanced rapidly, keeping pace with other branches of science, and bringing into prominence many names which can never be disconnected from it. I propose to mention a few of these in chronological order and to specialize some important advances.

HOFFMANN : 1811.

HAUY : 1822. May be said to have founded the Science of Crystallography by the study of calc spar; also the law of Heminorphism and Electric Properties of Minerals.

MOHS : 1822. Scale of Hardness.

LEONHARD : 1826.

BAUDANT : 1830. Voyage Mineralogique et Geologique in Hongroie. Cours Elementaire de Mineralogie et Geologie.

PHILLIPS : 1822. Classified Minerals, thus : (1) Earthy ; (2) Alkaline Earthy ; (3) Acids ; (4) Acidiferous Earthy Minerals ; (5) Acidiferous Alkali Minerals ; (6) Acidiferous Alkaline Earthy Minerals ; (7) Minerals unanalyzed or little known ; (8) Native Metals and Metalliferous Minerals ; (9) Combustibles.

HAUSMANN : 1828.

GLOCKER : 1839.

HARTMANN : 1843.

NICOL : 1849.

Haidinger : 1851. His father, Karl Haidinger, did much to develop the science during the latter years of the 17th Century. We are indebted to Haidinger for several important works, notably:—*Handbuch der Bestimmten Mineralogie* ; *Essays on Colors and Treatises on Augite and Amphibole.*

ERDMANN : 1853.

BLUM : 1854.

GIRARD : 1862.

DES CLOISEAU : 1862. Did much to increase our knowledge of the optical properties of minerals.

QUENSTEDT : 1863.

ANDRE : 1864.

SCHRAUF : 1865. Did much work in Crystallography.

PLATTNER : A famous name in the history of the Blowpipe ; he applied this instrument to quantitative use. His treatise, *Die Probirkunst mit dem Lothrohrrohre*, is in use to-day.

KOKSCHAROW : 1866. *Chemical Mineralogy.*

FUCHS : 1868. Numerous works—notably : *Ueber der Gegenseitiger Einfluss der Chemie und Mineralogie.*

RAMMELSBERG, 1860, and FRESSENIUS, 1869, may be mentioned among later investigators in *Chemical Mineralogy.*

Within the last few years many advances have been made, new minerals are being discovered daily, abstruse investigations into the minute physical structure and character are being conducted. Crystallography has become a matter of deep importance. Magnificent instruments for physical research in minerals are being made and used. Investigation of the optical properties of minerals are being conducted, in which connection the names of Groth, Zittel, Rosenbush, Fouquet, Levy and Williams are to be especially mentioned.

In pure classificatory work Dana Naumann and Tschermak are perhaps pre-eminent, but it is out of our purpose to even mention the host of writers who of late years have added so much to our fund of information on the mineral kingdom.

Before closing I would like to emphasize the fact that considerable investigation has been conducted in Canada bearing on the subject. Sir Wm. Logan described many Canadian minerals and marked out the localities of their occurrence. Dr. Selwyn, late Director of the Geological Survey, has done much to advance the science in a general way. Dr. Harrington, of

McGill, is a celebrated mineral analyst, probably the most noted in Canada. Prof. Chapman's various works and essays are of world-wide fame. We are indebted to him for numerous blowpipe reactions and for a large amount of information on Canadian localities, together with many observations on crystallographic peculiarities.

In connection with the optical properties of minerals, and the application of the microscope to the investigation of rock-forming minerals, may be mentioned the names of Dr. Adams, of McGill; Mr. Ferrier of the Geological Survey, and Prof. Coleman, recently appointed on the staff of the University of Toronto. Investigations of this kind and researches in Crystallography may be considered as the latest phase of mineralogical work, and as that department of the subject receiving most attention from the leading mineralogists of to-day.

CELESTIAL MECHANICS ; PTOLEMY, COPERNICUS
AND NEWTON.

BY J. C. GLASHAN.

[Presented to the Mathematical and Physical Society.]

PART I.

THE mutability of fortune and the vanity of fame have ever been favourite themes with moralists of the ascetic class and philosophers of the pessimistic school, and certainly it cannot be denied that these have ever found an abundant supply of illustrations of their texts in the lives of kings and courtiers, of warriors and statesmen, and in the quickly fading memories of their achievements and their glory, of their failures and their shame. Less frequently have the worshippers of mediocrity, the advocates of obscurity, drawn their examples from the records of literature and art, while the history of philosophy and science they have passed by as a barren field; yet surely no more striking illustrations of the instability and waywardness of popular opinion can be found than are afforded by the estimates that have passed and still pass current even among the learned, of the nature and the relative values of the astronomical theories advanced, and the doctrines taught by Claudius Ptolemy and Nicolaus Copernicus respectively.

For fourteen centuries Ptolemy was esteemed the greatest of astronomers, compared with whom there were none others great. Throughout this long train of years, the history of astronomy is the history of the comments on his writings, and to question the truth of aught contained in his *Megalé Syntaxis*, or to doubt the reality or the necessity of his eccentrics and epicycles, was little short of heresy and high treason combined. To-day, to nine out of every ten in the scholastic world, Ptolemy is but the eponymous author of a system of astronomy which modern science has shown to be somewhat absurd and altogether

false, and his writings are supposed to be of value only as the fossil remains of an extinct theory. He who for a thousand years bore the proud title of Prince of Astronomers, now ranks as one of those whom the world once deemed great only because it knew no better; he shone bright during the dark ages only because those ages were dark, only because the sun of Copernicus had not yet arisen. How are the mighty fallen! But is it true that we owe to Ptolemy naught but a discarded system of astronomy and the bitter memories of the fierce disputes that raged between its upholders and its opponents in the days of Galileo? No, this is not true! The Ptolemaic system of astronomy has been overthrown and the Aristotelian system of physics on which it was founded is discredited, but Ptolemy's trigonometry and Ptolemy's epicycles still bear sway wherever modern science has passed the classificatory and qualitative stages, and has become quantitative and exact. As a geometer, Ptolemy was "perspicuous, elegant, powerful and profound," ranking in these respects with Euclid, Archimedes and Apollonius, for nowhere in the writings of these the greatest of the Greek mathematicians is there anything to be found more beautiful than are the geometrical chapters of the *Almagest*. Had not Ptolemy's renown as an astronomer so completely overshadowed his reputation as a mathematician, his name would doubtless to-day be a synonym for trigonometry as Euclid's is for elementary geometry, and it should be remembered that in the invention of trigonometry and the computation of his canon of chords he did as much for applied science as all the other geometers together did for abstract science. Of the modern employment of the Ptolemaic epicycles, De Morgan, secretary of the Royal Astronomical Society of London, wrote in 1844: "The common notion is that the theory of epicycles was a cumbrous and useless apparatus, thrown away by the moderns and originating in the Ptolemaic or rather Platonic notion that all celestial motions *must* either be circular and uniform motions or compounded of them. But, on the contrary, it was an elegant and most efficient mathematical instrument which enabled Hipparchus and Ptolemy to represent and predict much better than their predecessors had done; and it was probably at least as good a theory as their instruments and capabilities of observation required or deserved. And many

readers will be surprised to hear that the modern astronomer to this day resolves the same motions into epicyclic ones. When the latter expresses a result by series of sines and cosines (especially when the angle is a mean motion or a multiple of it) he uses epicycles; and for one which Ptolemy scribbled on the heavens, to use Milton's phrase, he scribbles twenty. The difference is that the ancient believed in the necessity of these instruments, the modern only in their convenience; the former used those which do not sufficiently represent actual phenomena, the latter knows how to choose better; the former taking the instruments to be the actual contrivances of nature was obliged to make one set explain everything, the latter will adapt one set to latitude, another to longitude, another to distance. Difference enough no doubt, but not the sort of difference which the common notion supposes." Such was the state of affairs fifty years ago; to-day epicycles may be said to possess the heavens above and the earth beneath and the waters and the air between, nor has the all-pervading ether escaped them. In analytic guise they dominate the mathematics of hydrokinetics and sound, of heat, light and electricity; in fact, wherever there is either periodic or irregular motion, there the mathematician "scribbles" his epicycles, and not content like Ptolemy to wheel them on simple circles he rolls epicycle on epicycle to the third, the fourth or the fifth degree. Nor does their influence end here. Machines have been made to record for a sufficient length of time any motions for the character of which a working theory has to be found; other machines analyse the records into epicyclic movements, smoothing out or rejecting accidental irregularities, and still other machines re-combine the epicycles to predict the motions as they will occur at a future time or under given changes of condition. Thus we have mechanical tide-predictors, harmonic analysers of meteorological phenomena, epicyclic tracers of deviation curves for the compasses in iron ships, and a fast increasing array of other such machines.

Before leaving the subject of the varying opinions concerning Ptolemy and the Ptolemaic system, which have ruled among scholars, it may be well to notice Ptolemy's relation to Hipparchus. Hipparchus has been styled the Father of Astronomy, and undoubtedly he was the greatest practical astronomer among

the ancients. For observations of the movements of the sun, moon and stars, and of the positions of the fixed stars, Ptolemy constantly quotes him as an authority against whom there could be no appeal. But Delambre, in his history of Ancient Astronomy, is not satisfied with making Hipparchus a great observer; he will also have him to have been a great mathematician. He claims almost everything in the *Almagest* for Hipparchus, leaving next to nothing for Ptolemy.

If Ptolemy gives Hipparchus credit for anything, well and good; if not, then he ought to have done so, for Hipparchus *ought* to have discovered the thing, and therefore he *must* have discovered it. Except for a few scattered remarks in Pliny and in one or two astronomical writers, Hipparchus is known to us only through his own writings and through the writings of Ptolemy. Judged by the former (his own writings) Hipparchus is a second rate astronomer and a third or fourth rate mathematician; judged by what Ptolemy attributes to him he is worthy of the high name of Father of Astronomy. The truth would seem to be that Hipparchus was the greatest practical astronomer among the ancients, such another as Tycho Brahe among the moderns, but his mathematical abilities were much inferior to his powers of observation. Ptolemy, on the other hand, was a very poor observer, but he possessed mathematical genius of the highest order. He depended almost wholly upon Hipparchus for the observations he employed as data in working out his theory, and gave full credit for all he borrowed. Hipparchus has lost no fame at the hands of Ptolemy. What, then, led Delambre to form the estimate which he did of the relative merits of the two men? Delambre was himself a far better astronomer than mathematician. He could appreciate Hipparchus; he could not appreciate Ptolemy.

If Ptolemy in the present age does not receive the honour that is justly his due, how stands the case with Copernicus? Exactly the other way. Copernicus receives honour to which he has not the slightest claim. His name is now commonly given to a system of astronomy, the invention and development of which was as much beyond his powers as the flight of an eagle is beyond the powers of a barn-yard fowl. Too many of the writers on astronomy of the present day attribute to Copernicus

a system which required the titanic labours of Kepler and the piercing intellect of Galileo to found, the transcendent genius of Newton to construct and explain, and the unrivalled analytical skill of Laplace to finish in full detail. For example, Prof. Chas. A. Young, in his Text Book of General Astronomy, says: "The system of Copernicus, as he left it, was *nearly* that which is accepted to-day." There is not a rag of the system of Nicolaus Copernicus in the Copernican system as delivered by Newton, Laplace and Gauss. If any astronomer of the present century possessed the mental constitution and habit of thought necessary for a just appreciation of Copernicus and his work, that man was Richard A. Proctor, and he has said: "When we consider the ignorance and the prejudices of the age in which he lived, we cannot hesitate to admit the claim of Copernicus to a high rank among philosophers," but "there is little reason for thinking that astronomy would have been less perfect or that any discoveries since made in it would have been retarded a single day even if he had never lived." No man in the slightest acquainted with the history of physics and astronomy could say the like of Hipparchus or Ptolemy, of Tycho Brahe, Kepler, Galileo or Newton.

The mention of Tycho Brahe reminds me that he too has been misrepresented by several of our best known modern writers on astronomy. For example, Oliver Lodge, in his "Pioneers of Science," states that Brahe denied the motion of the earth because it was contrary to the teachings of Scripture, and Chas. A. Young says that *one* of Brahe's reasons for rejecting the Copernican system was "that it was unfavourably regarded at Rome." The Biblical difficulty was certainly recognized by Brahe and *may* have influenced him to a certain extent, but as for the Church of Rome it took no notice of the controversy between Copernicans and anti-Copernicans till several years after the death of Brahe. For sixty years after the death of Copernicus there were as many churchmen among the Copernicans as among their opponents, and the dispute was conducted with perhaps less bitterness than has been shown in our own times in the disputes between Darwinians and anti-Darwinians. The truth is that it was for physical reasons that Brahe and many of his contemporaries could not accept any theory that

required the earth to move, for, before the time of Galileo, no one could explain nor could the wit of man imagine how, if the earth moved, an arrow shot directly upwards could fall back upon the spot from which it was shot, nor how, if the earth were not in the centre of the universe, the arrow could fall back at all.

To explain and justify the preceding statements and in particular the apparently harsh opinion of the value of the labours of Copernicus which I have quoted from Richard A. Proctor, I propose to describe, as briefly as may be, the systems of celestial mechanics put forth by Ptolemy, Copernicus and Newton respectively.

If you carefully note on several nights the grouping of the stars and the relative arrangement of the groups, you will find that, omitting five certain stars, the groups always retain the same form and remain in the same relative position. The "dipper" is always a dipper and has been so by actual record for at least 2,000 years; the three stars in line in Orion's belt remain always in line; the four stars forming the Great Square of Pegasus are always "in square;" and the five star W in Cassiopeia remains ever a W. If you continue your watch for several hours on any night, you will find that the stars all appear to wheel from east to west in circles, each star requiring about 24 hours to traverse its circle and return to the selected starting point; and further, that all the circles have the same centre in the heavens—viz., a certain point about mid-way between the zenith or overhead point and the horizon. This point is called the Northern Pole of the heavens. Its location can be conveniently determined by means of the Pole Star (Polaris), which is distant from the Pole itself by a little more than twice the apparent diameter of the moon. To an observer in the southern hemisphere, say at the Cape of Good Hope or in New Zealand, the stars would appear to revolve around a fixed point called the Southern Pole of the heavens. There is no prominent star near the South Pole to mark it out as Polaris marks out the North Pole. Thus the stars appear to move as if they were affixed to the inner surface of a great hollow sphere which rotates once a day from east to west on an axis passing through the poles. We shall call this imaginary spherical shell, the Sphere of the Fixed Stars, or Sidereal Sphere.

If now you continue your watch and observe closely for several months, you will find that the time of apparent rotation of the sidereal sphere is slightly less than the time of apparent daily rotation of the sun about the earth. For example, if you select for observation a fixed star which crosses your meridian (the great circle drawn from pole to pole through your zenith) at midnight, 15 days later you will find that star on the meridian at one minute after eleven o'clock p.m., in 30 days it will be on the meridian at two minutes after ten o'clock p.m., and in 60 days it will cross your meridian at four minutes past eight p.m.

A sun-dial marks actual sun-time, an ordinary clock or watch set to local time and running accurately, marks average sun-time. If you were to construct a sun-dial and were to note by it on each day for some length of time, the exact moment of the sun's meridian transit, you would find that the period of apparent daily revolution of the sun around the earth is not absolutely constant; from sun-on-meridian or sun-dial noon on one day to sun-dial noon on the next day is sometimes a few seconds less than the average day, in other words, the sun-dial is gaining on an accurately running clock; sometimes it is a few seconds more, or the sun-dial is losing by the clock. Briefly, sun-dial time and local clock time do not always agree, as you all know. It is different, however, with the rotation of the sidereal sphere. Day after day, year after year, each and every one of the fixed stars appears to make one revolution about the poles of the heavens every 23 hr. 56 min. 4.09 sec. of mean solar time. As far as observation goes, this rate of rotation is absolutely constant, although the theory of the tides would seem to indicate that it is slowing up at the rate of a few seconds a century. We shall therefore take the sidereal sphere as our perfect time-keeper, and shall call its time-length of rotation a Sidereal Day. From what has already been said you will easily see that a sidereal day is shorter than an average or mean solar day by 3 min. 55.91 sec. of mean solar time, or otherwise expressed, a mean solar day is longer than a sidereal day by 3 min. 56 $\frac{1}{2}$ sec. of sidereal time.

What does this difference in time of revolution mean as regards motion of the sun and stars? Simply that in their apparent daily revolutions from east to west around the earth, the

stars gain on the sun; or, taking the star-movement as our standard, the sun falls behind the stars reckoning from east to west, or advances among the stars reckoning from west to east, at the rate per day of nearly 4 min. in time or nearly twice his own apparent width in arc, and in consequence seems to advance among the stars from west to east through a complete circle in the course of a year. If you were to mark on a celestial globe the sun's apparent place among the stars at noon every day for a year and then join together the points thus laid down, you would find you had a complete circle; but you would also find the poles of this circle not at the north and south poles of the sidereal sphere but at points rather more than one-quarter of the way from the poles to the celestial equator. The northern pole is near the mid-point between Polaris and the bright star Vega. This apparent path of the sun among the stars is named the ecliptic, and the plane of this ecliptic cuts the plane of the equator at an angle slightly greater than the quarter of a right angle. An immediate consequence of the poles of the ecliptic not coinciding with the sidereal poles is that while a fixed star always remains at the same distance from the north pole, the sun is sometimes nearer to that pole and is then high in the heavens at noon, and is at other times farther from it and is then low in the heavens at noon. There is another thing which, if you observe closely enough, you will discover, viz., that the sun's rate of advance among the stars is not quite uniform, being a little faster when he is distant from the north pole—*i. e.*, in our winter-time—than when he is nearer the north pole or is high in the heavens at noon—*i. e.*, in our summer time. Hipparchus discovered still another thing about the ecliptic—viz., that the point where the celestial equator crosses it is slowly receding westward on the equator as if to meet the sun, at the rate of twice the average apparent width of the moon every 75 years; otherwise expressed, the north sidereal-pole is revolving around the north ecliptic-pole at the rate of one complete revolution in 25,800 years. Twelve thousand years from now Vega will be the north polar star.

So much for the apparent motion of the sun relative to the fixed stars. Turn now and observe the moon. She comes to the meridian later and later each day by an average of 50 m. 36 s.

of mean solar time, so that from new moon to new moon or from full moon to full moon is very nearly 29 d. 12 $\frac{3}{4}$ hr. Plotting on a celestial globe the moon's apparent path among the stars, you will find that she advances eastward at the rate of one complete revolution from star around again to star in somewhat less than 27 d. 7 $\frac{3}{4}$ hr.; but that her path does not form a closed circle, but winds round and round not returning into itself until after 235 revolutions, occupying 19 years in time, and even then the return is not absolutely perfect. Further, you will find the moon's meridian altitude or apparent height above the horizon at times of crossing the meridian has a greater range than that of the sun; she may cross the meridian at a higher point than the sun ever attains by ten times her own apparent width, or she may cross at a point that is that much lower than the lowest at which the sun ever crosses.

In speaking of the stars as fixed in their mutually relative positions I made exception of five that are visible to the naked eye. These five appear to move among the other stars, and have consequently been called "planets"—*i. e.*, wanderers. They are named Mercury, Venus, Mars, Jupiter and Saturn. Mercury is a bright star when visible, but can very seldom be seen, being always near the sun. Venus and Jupiter are at all times brighter than the brightest of the fixed stars. Mars and Saturn are brighter than all but a few of the fixed stars, Mars indeed being at times brighter than any of them. At the present date, 21st March, 1895, the planets are visible as follows: Mercury may be seen as a morning star, rising a little south of the point on the horizon at which the sun rises; Venus is very conspicuous as the evening star setting shortly after the sun; Jupiter appears as a very bright star in the south-west heavens during the first half of the night; Mars is about mid-way between Jupiter and the Pleiades; Saturn is on the meridian about two hours after midnight, almost directly south of the bright star Arcturus, and nearly mid-way between it and the horizon.

These five planets seem to move among the fixed stars in paths that never go far from the ecliptic; but, unlike the sun and the moon, they do not always advance, but at times appear to turn back in their courses for short periods, but soon commence to advance again. For example, had you watched the path

of Jupiter since the 1st September, 1894, you would have seen that the planet was advancing among the stars throughout September and the first three weeks of October, the rate of advance becoming slower and slower until October 23rd, when it had ceased to advance. It then began a retrograde movement, slow at first but ever increasing until the middle of December, after which it constantly decreased in rate until on the 20th of February it ceased altogether, and the planet began to advance again and has been advancing faster and faster ever since. Jupiter is now about as far advanced as it was on the 15th January last, but is about one-third of the moon's apparent diameter higher in the heavens; it will not have completely recovered the advanced position it held in October last until about the 17th of May next, but it will then be higher in the heavens than it was in October by somewhat less than the apparent width of the moon. It will continue to advance until near the last week of November, when it will become apparently stationary for a short time, and then reversing its motion will slowly retrograde during December, January, February and March, but in April it will begin its advance again. All the planets exhibit this back and forth movement among the fixed stars. In this instance it results in a double recurving of Jupiter's apparent path, but regression may produce a loop or even a double loop in the path. In the case of Mercury and Venus, regression occurs only when these planets are between the earth and the sun; in the case of Mars, Jupiter and Saturn it happens when these planets are on the opposite side of the earth from the sun. In every case earth and planet are on the same side of the sun, and when the planet is at the mid-point of its arc of regression it is in a direct line with earth and sun. Approximately, Mars makes one loop per circuit (a nearer approximation is 37 loops per 42 circuits in 79 years), Jupiter makes 11 loops per circuit, and Saturn 57 loops per 2 circuits in 59 years, Mercury makes 41 loops in 13 years and Venus makes 3 loops in 5 years.

These are the apparent motions of the planets among the fixed stars. Comparing their positions with that of the sun, Mercury and Venus swing back and forth about the sun, Mars, Jupiter and Saturn even when advancing do not move eastward as far as the sun, and therefore when compared with him in posi-

tion seem to move ever westward in the same direction as the motion of the fixed stars.

The preceding is a non-mathematical and necessarily imperfect description of the main features of the motions of the heavenly bodies as they actually appear to an observer standing on the earth. The problem of Celestial Mechanics is to determine what the motions and masses of these bodies must really be according to the general principles of mechanics, the science which deals with the laws of the motion of bodies. Many solutions have from time to time been proposed, but most of them were mere fanciful speculations not founded on any recognized principles of physics. Others, like the solution proposed by Copernicus, took account of the speed and direction and of the changes in speed and direction of the motions of the heavenly bodies, but took no account of the causes of these changes or whether the solution arrived at could be physically possible. These were merely geometrical solutions. Three solutions have been proposed, based on the principles of physics and mechanics generally accepted at the time the several solutions were offered. These were the Ptolemaic or Geocentric system based on the Aristotelian physics, the Cartesian or Heliocentric system based on the physics of Galileo and the vortices of Des Cartes and the Newtonian or Barycentric system based on the theory of gravitation and the Galilean physics completed by Newton.

In Aristotle's system of physics, there were assumed four elements, which, uniting in various proportions, composed all bodies. These were earth, water, air and fire, corresponding to our solid, liquid, gas and ether. Each element had a position in the universe proper to it relative to the other three elements, and if it were removed from this relative position, it would seek to return thereto. As all bodies were constituted from the elements, each body had a position proper to it relative to every other body, and the weight or the buoyancy of a body was only its endeavour to return to the position proper to it, out of which it must be moved to have either weight or buoyancy. (In modern language, the position proper to a body was its position of equilibrium under the joint action of what may be called the general forces of nature.) The position proper to earth was the centre of the universe, and consequently any solid if lifted up

would, when let go, seek the centre of the universe. Assuming the centre of the universe to be at the centre of the earth-sphere, solids would fall towards the earth at every point on its surface, and therefore at every place on earth whether on the Mediterranean side or on the opposite side, whether in Greece or in farthest India, *down* was towards the earth's centre, *up* was away from the earth towards the heavens. The position proper to water (liquid) was above earth (solid), but *next to it*. A stone thrown into water would sink because it was chiefly or wholly earth, and therefore the position proper to it was below water. A piece of cork would float because although it contained earth (solid) it also contained much air, and the position proper to air (gas) was above water. A pail full of water would have no weight so long as it remained in the water because the water in the pail was in the position proper to it, but if the pail with its contents were lifted up, the whole would have weight because the contained water would now be out of its position, being in or above air. The position proper to fire was above air, and therefore "fire" always ascended. Smoke, steam and hot air always ascended because they contained fire in their composition. The striving of any body which happened to be out of the position proper to it, to return to that position was not conceived of as a mutual action or exertion of force between the body and the position proper to it, but simply as an innate tendency inherent in the body. We may smile at these "proper positions" and "innate tendencies" as somewhat childish conceptions, hiding ignorance and assuming the very things which they were put forward to explain, but before we smile too broadly let us bethink ourselves of the theory of gravitation, and, if we reject the hypothesis of action at a distance—*i. e.*, the hypothesis that a body can act where it is not without the aid of any intermediary—let us endeavour to imagine a mechanism which will cause *every* particle of the universe to tend to change the motion of *every other* particle, the rate of change depending in the case of every pair of particles solely on the masses of the particles and on the distance between them.

In modern mechanics, the first of the three fundamental postulates or laws of motion is, "Every body continues in its state of rest or of uniform motion in a straight line, except in so

far as it is compelled by impressed forces to change that state. In ancient mechanics, the corresponding law or postulate was "The only natural permanent motion is uniform motion in a circle or a motion compounded of uniform circular motions." A modern mathematician might point out, as leading up to his statement of what would be the nature of the motion of a body not acted on by any external or impressed forces, the experiment of sliding a block of stone on a sheet of ice. In proportion as the stone and the ice are made smoother and smoother, the farther will the stone slide and the more and more nearly uniform will its motion become, so that we can readily pass in imagination to the extreme case of ice and stone being both absolutely smooth, in which case the stone's motion will be absolutely uniform and will therefore be permanent. The ancient philosopher would point out that in such case the sheet of ice must be spherical in form with its centre at the centre of the universe, for if it were a plane touching the earth at any point, the stone, if hurled along the plane from the point of contact of the ice-sheet with the earth, would rise in the air higher and higher the farther it went, and would soon be brought to a standstill, and then back towards the earth by its tendency to seek its proper place relative to the other bodies in the universe. The modern might reply that the return of the stone is caused by the attraction between the earth and stone, which in respect to the stone considered apart from the earth is an external or impressed force, and that in his statement of the law all cases in which impressed forces act were expressly excluded. The ancient might answer in return that this so-called attraction is inherent in the stone, that without it the stone would not be a stone, and that in consequence it must be taken account of in considering what is the natural motion of a body. The answer to the question which of these two *laws* is a correct statement of the facts of motion in nature, would now turn on the answer to the question whether the attraction of gravitation acting on or inherent in the stone was a tendency to move towards the centre of the earth or was a stress between every particle in the stone and every other particle in the universe. But even had the ancients arrived at a correct view of the character of the attraction of gravitation, they would have gone astray in solutions of kinetical problems, for they had

not grasped the idea of inertia in its completeness and of the composition of accelerations. We know by experiment that if a person sitting in a rapidly advancing railway carriage wishes to toss an orange across the aisle of the carriage he tosses it exactly as he would do if the carriage were standing still. The ancients believed that he would have to toss it forward and across; forward that it might not be left behind as the carriage moved on, and across to send it to the other side of the aisle.

The ancients conceived of force solely as a pressure. The idea of measuring the forces acting on a body by the time-rate of change in the quantity and direction of the body's motion had not yet arisen. The true principles of inertia, the law of the composition of accelerations, and the necessarily two-fold aspect of the stress between two bodies whenever one acts on the other, had not then been grasped. Archimedes had investigated the mechanics of balanced pressures, but the idea of investigating the motion of bodies subjected to unbalanced "tendencies" and determining the laws of such motion, if laws there were, had hardly dawned on the minds of men.

Such were the physics and mechanics prevalent in the time of Ptolemy and that continued to be so until they were overthrown by Galileo some ninety years after the death of Copernicus, and with them the Ptolemaic system of astronomy was mechanically consistent, but the Copernican system was not.

The Ptolemaic system of astronomy is described and explained in detail in the *Megale Mathematike Syntaxis tes Astronomias* (the Great Mathematical Construction of Astronomy), now generally known by its Arabic name *Almagest*, of Cladius Ptolemeus of Alexandria. A brief statement of the principal hypothesis employed in the *Almagest* for the explanation of the planetary motions is also given in another of Ptolemy's writings entitled, "On the Hypotheses of the Planets."

Ptolemy, from his own observations and the data at his disposal, determines the earth to be a sphere nearly 20,800 miles in circumference, a determination which is too small by about one-sixth of the correct length. He advances reasons for believing that it is in the centre of the universe, but that it is little more than a point in comparison with the distance from it of the sphere of the

fixed stars which revolves with a uniform motion on an axis passing through the earth's centre. The precession of the equinoxes he explains later on, by a swaying of this axis on its centre like the swaying of the axis of a slowly spinning top. He mentions that some astronomers have declared that the motion of the stars may be only apparent, and that the real motion may be a rotation of the earth from west to east. While admitting that such assumption can simplify the explanation of many celestial phenomena, he denies the physical possibility of such a movement because all bodies on the earth's surface would be left behind by its rotation, nor could any bird or projectile advance eastward, so fast would the earth be whirling in that direction. He does not consider the possibility of the earth's having a motion of translation in space because he has already argued from the absolutely constant rate of rotation of the sphere of the fixed stars and from the invariableness of the configurations of the constellations that the centre of the earth must coincide with the centre of the star-sphere.

Between the earth and the fixed stars he places in order the Moon, Mercury, Venus, the Sun, Mars, Jupiter and Saturn. Thus the Sun's place is midway among these bodies. To explain his apparent movements, he was assumed to wheel eastward with stars round the earth in a circle once in a sidereal day, but at the same time to be whirled westward on the ecliptic at a uniform rate of nearly one degree per day, the seeming non-uniformity in his western advance being explained by making the ecliptic circle eccentric or out of centre with the earth.

Long before the time of Ptolemy, it had been pointed out that the multiform and seeming irregular loops and bends in the apparent courses of the planets among the fixed stars as seen by an observer standing on the earth, and consequently near the plane of the ecliptic, might turn out to be simple symmetrical loops when viewed from a point high above the earth in a line drawn through the centre of the earth and perpendicular to the ecliptic-plane. Now as it was believed that uniform circular motion was the only possible permanent motion, these looped courses must be epicyclic. If on a dark night a man were to swing a lighted lantern steadily round his head while he himself walked round and round in a constant pace in a large circle, the movement of

the light in the lantern would appear to a person standing at the centre of the large circle very much like the movements of the planets among the fixed stars. More particularly would this be the case were the lantern-bearer to walk round on a sloping plane swinging his lantern in a ring which moved always parallel to itself at a different slope from that of the plane of the bearer's path. Viewed from a point high above the centre of that path, the lantern would be seen to describe an epicyclic curve, the path itself would be the deferent circle, and the ring described by the lantern round its bearer's head would be the carried circle. Previous astronomers had proposed to explain the apparent motions of the planets by rotations in epicycles and eccentric circles, but Ptolemy was the first to prove that such an explanation was a possible one by actually computing the relative dimensions of the carried circles and deferents and the degrees of the eccentricities.

The Moon and the five planets were assumed all to revolve in small circles whose centres revolved eastward on the circumferences of large deferent circles, which were all eccentric with respect to the earth. In the cases of the Moon and Mercury the centres of deferents themselves revolved westward on other deferents, that of the Moon's system being concentric with the earth, but that of Mercury's being eccentric with it. The motions were all supposed to be in addition to or to be superimposed upon a uniform motion round the earth once per sidereal day. The rates of rotation of the moon and the planets in their small circles and the centres of the small circles in the circumferences of their deferents were assumed to be uniform, since it was believed that none but uniform circular motion or a motion compounded of uniform circular motions could be stable and therefore permanent. The planes of the deferent circles were all inclined to the celestial axis at nearly the same angle as the plane of the ecliptic, but the planes of the carried circles were inclined to the planes of their deferents at various angles, all however remaining constant.

(To be continued.)

THE FALL OF THE ENGLISH MONASTERIES.

BY G. B. WILSON, '94.

[Presented to the Political Science Club.]

MONASTICISM was not the creation of any single individual, the distinctive feature of any one religion, nor even the phenomenon of any single period of human history; its genesis is to be sought in a principle which manifests itself early in the history of civilization. Monasticism has always had its attractions for men of a certain temperament, and is really due to the thought, always more or less prevalent, that it is possible to realize a higher ideal of life in seclusion than in society. Its particular environment at any given time will probably explain to a large extent its varying manifestations.

In proof of these views, it is only necessary to remark that monasticism of the Oriental type has always been anchoretic and egoistic. Society was utterly depraved, and was therefore to be shunned and left to its fate. The best that could possibly be hoped for was the sanctification of the individual who chose the solitary life. On the other hand, the prevailing type found in Occidental countries has been cenobitic, almost communistic; a solitude with certain social aspects, and conceived of as having a mission to influence and regenerate society.

Three principal forces are said to have co-operated in shaping the course of development of early Christian monasticism. On the theoretical side, it has been suggested, by Eusebius, Sozomen and Cassian, that the contemplative and ascetic temperament of the Oriental mind had already developed such pre-Christian monastic communities as the Therapeutæ and Essenes, and that this spirit was carried directly through Essenism into the infant Christian church. A second coincident force is found in the position taken by the Alexandrian Neo-Platonists—a school then dominant in the realm of metaphysics and ethics—that the human intellect was purified and quickened by

an abstemious mode of life. The operation of these two forces was stimulated by a reaction in the direction of the simplicity and rigour of the earlier republican era in Rome, a reaction which was a natural recoil from the luxury and effeminacy of Imperial times. With the rapid spread of Christianity, and the admission to its ranks of many whose obedience to its precepts was imperfect and spasmodic, the stricter professors of the new religion stood out in marked contrast to the more latitudinarian in doctrine and morality, and all the more readily drifted to the thinly populated districts and to the monastic habit of life.

The striking feature of thirteenth century monasticism was the institution by Innocent III. of the Mendicant Orders or Friars. The monk (*μόνος*) was the *lonely*, pious man, and the great monasteries were founded in the country; the friar (*frater*) was the friendly, *brotherly* man who dwelt chiefly in the towns.* Of these orders, the strongest and worthiest were the Franciscans and Dominicans. The former were, for a time, a standing protest against the wealth and inactivity of the older orders; the latter were the most intellectual preachers of their day, and combined the ideas of non-endowment and itinerancy. These orders soon became very popular, wealth poured in upon them almost unsolicited, their vow of poverty was soon broken and mendicancy degenerated into vagrancy.

From the fourteenth century must be dated the gradual decline of mediæval monasticism. Almost no new orders were founded, and apart from the internal causes of decay just mentioned, and others which might be assigned, there was sufficient pressure from without to overthrow a system even much less effete. The schism of the west weakened the whole church and robbed monasticism of the protection of those who should have been its sturdiest defenders. Lollards and Hussites were the deadly foes of monks. Trained ears, too, might easily detect far-off mutterings of the coming Reformation. Nor were there lacking those who assailed, some the abuses of the system then believed to be existing, and others the system itself.

Soon the attack was at its height. The "Supplication of

* It is a significant fact that population was already leaving the little communal villages and beginning to concentrate more in the towns, and that the development of civilization left more leisure to cultivate the social side of life.

Beggars," by Fish, has been called "the happiest libel of the day." No doubt there are exaggerations in its account of the abuses existing, but its very success shows that the monks had got control of great property, which they were not using for the public good. The agitation was not allayed by the publication by Von Hutten of the "Epistole Obscurorum Virorum." It was increased, too, by the skilful attacks of Erasmus, and it was fanned to a flame by the effusions of a host of less learned, but perhaps not less dangerous, writers. The merits of the attack need not be discussed here. It is not the business of the historian to assault or to defend, on *à priori* grounds, the principle of monasticism; this duty belongs to the philosopher and the theologian. Nor must he let himself be drawn from the work of recording and interpreting what has been to the useless task of discussing what might have been.

Already at the Norman Conquest, there had been three hundred monastic houses in Britain. During the Norman period, three hundred and forty-two monasteries were founded. The Plantagenet regime witnessed the creation of four hundred and thirty-six monasteries and one hundred and ninety-two friaries. During these two periods, seventy-eight colleges and one hundred and ninety-two hospitals had also been established.

That the development of monasticism in England had been abnormal is suggested by the fact that from the time of Henry IV. to that of Henry VIII., a period of one hundred and thirty years, only eight religious houses had been founded. What, then, was the function, and what was the internal condition, of the English monasteries at the time of the suppression? Answers, not a few, have been made to the question, and it may be well here to contrast different views. Father Gasquet,* in defence of the monasteries, paints such a charming picture of monastic life; passes so lightly over its darker features; so magnifies the hardships connected with the abolition; so blackens the characters of those who were the instruments of the suppression; and so ignores the general verdict of contemporary and succeeding generations, as almost to win a *requiescant* from their opponents, and to justify the surmise that the present object of Roman Catholicism in the field of literature is to

* Gasquet's *Henry VIII. and the English Monasteries.*

re-write history. Quoting chiefly from the "Rites of Durham," Gasquet gives the following picture of the daily life of a monk at this time; and, without unfairly prejudicing the case, it may be said to strike the reader as an ideal conception rather than as an actual portrait. "Teaching, study, and the cultivation of the arts and sciences occupied the attention of the entire community. As a rule, early rising, simple fare, and constant work, done only with the hope of a higher reward in the world to come, was the lot of the monk." The main purposes of monasticism were, "worship, improvement, work. A monk's life at that period was eminently a social one; he lived night and day in public." "The night office, now known as 'Matins,' began not later than two in the morning, sometimes at midnight. . . . The Matins and the Matutinae laudes formed practically one service, occupying the entire two hours. The labour of this night service was followed by a brief period of rest, till, at five, the community again assembled in the choir for the office of Prime, which was followed by the daily chapter. There, faults were corrected, encouragement given, the labours of the community apportioned, and, when occasion required, matters of common interest were discussed and arranged." "At the stroke of six, the short chapter mass was sung, and after this, study or exercise occupied the monks till eight o'clock. At that time, once more the stroke of the bell called them to the High Mass, to which the time till ten was allotted. Then came the meal of the day, except on fast days, when it was some hours later. In the refectory, strict order was preserved, and the superior, or his chief officer, presided. The monks waited in turns upon each other, and, during the meal, the sacred Scriptures were read. . . . And so, after grace was said, they departed to their books. . . . From study, the monks went at three each afternoon to chant their vespers in the church. . . . Vespers over, the monks returned once more to the cloister, till the tolling of the bell announced the evening meal. . . . And when every man had supped, they departed to the chapter-house to meet the Prior every night, there to remain in prayer and devotion till six o'clock. At this time, upon the ringing of a bell, they went to 'Salve.' The hour of 'Compline' over, and a brief space devoted to private prayer, all retired to the dormitory, till the bells, which rang ever at midnight, . . . proclaimed,

with the new day, another round of prayer and labour." To the mind of Mr. Gasquet, the monasteries were at the time of their dissolution still enshrined in the hearts of the English people, were an efficient organization of national charity, a deservedly wealthy institution, whose heads formed the bulk of the Lords Spiritual and were the social equals of the proudest of the English nobility. In his view, Henry VIII. was a merciless iconoclast, monasteries, the centres of civilization, religion and culture, their suppression unjustifiable, the manner of effecting indefensible, the Reformation itself a blunder.

The popular conception of monasteries has found an exponent in Mr. Froude. More vivid in his description than Mr. Gasquet, but rivalling him in one-sidedness, he holds for the pristine purity and perfection of English monasteries, and for their utterly degraded condition at the time of the great suppression. "Originally," he says, "and for many years after their foundation, the regular clergy were the finest body of men of which mankind in their chequered history can boast;" but, alas! "the soul of 'religion' left it in the fourteenth century." "Wyclif had cried that the rotting trunk (of monasticism) cumbered the ground and should be cut down." Concerning the truthfulness of the "Visitors'" reports, Mr. Froude is quite credulous and Mr. Gasquet is as thoroughly sceptical. Mr. Thorold Rogers, a somewhat ecstatic economist, with a theory to prove,* says: "The monks were the men of letters in the Middle Ages, the historians, the jurists, the philosophers, the physicians, the students of nature, the founders of schools, authors of chronicles, teachers of agriculture and fairly indulgent landlords," but even he admits that they created much of the poverty they alleviated. Mr. Seebohm, on the other side of the question, remarks that "the popular complaints against them were not found to be baseless. Scandal had long been busy about the morals of the monks. The commissioners found them, on enquiry, worse even than scandal had whispered, and reported to Parliament that two-thirds of the monks were leading vicious lives under cover of their cowls and hoods."

* In his work on *Six Centuries of Work and Wages* he starts out to prove that the English labourer was worse off in the eighteenth than in the thirteenth century. His investigation has been more extensive than careful; some of his conclusions are hasty.

Much illegal sequestration of monastic property occurred prior to the time of Henry VIII. "The monks shrank in all disputes from a trial by jury, and often chose to suffer loss rather than to encounter the adverse feeling which was sure to be manifested against them."* Nor were there lacking instances of houses which had involved themselves deeply in debt, squandered their revenues, depleted their resources, encumbered and even alienated much of their property. In the reign of John the number of alien priories was eighty-one. All of these were confiscated by this despotic monarch, who took their annual revenues for his private requirements. Edward I. also confiscated one hundred of them, and Edward II. suppressed the Templars, and transferred much of their wealth to the Hospitallers. But alien priories were an exotic that thrived well on English soil in spite of successive sequestrations by subsequent sovereigns, until, in the reign of Henry V., in a Parliament at Leicester, they were, to the number of more than one hundred, finally suppressed, part of their possessions being bestowed on other monasteries and on schools, and part being granted or sold, though not in perpetuity to the laity.

It is worthy of note that the statute of 15, Richard II., cap. 5, made it mortmain to be seized of lands to the use of religious or spiritual persons, and that 27, Henry VIII., generally known as the Statute of Uses, annexed the actual ownership to the use; both of these enactments, as well as other similar ones, evidence the jealousy with which the governing classes regarded the accumulation of landed property by the ecclesiastical, and especially by the monastic, establishments.

Schemes, too, for the transfer of part of the wealth of monasteries to other ecclesiastical purposes, though never carried into effect, had been projected by such eminent scholars and influential ecclesiastics, as William of Wickham, Waynflete and Fisher. In 1523 Wolsey had himself obtained papal bulls, authorizing the suppression of forty small monasteries and the application of their revenues to educational foundations. The suppression was justified on the ground that these monasteries were useless, and that this diversion of their wealth, to educational purposes, was in the true interests of the church. As a result, then, of the in-

* Dixon's History of Church of England, Vol. I.

teraction of this plexus of forces, only about one-half of the foundations known to have previously existed were still in existence at the time when Cromwell began the general dissolution. It is thus quite evident, that Henry VIII. was not lacking in precedents which might suggest both the idea of a general dissolution, and the means by which it might be brought about. He merely did his work more thoroughly—perhaps, too, more recklessly—than any of his predecessors had done. It was characteristic of this astute monarch, that he was usually careful to obtain the most complete legal sanction for the perpetration of flagrant injustice. “Equity follows the law” is an old legal maxim; but, in the time of Henry VIII., the law did not always follow equity. In the present case it was by parliamentary enactments that Henry VIII. gradually drew the monasteries within the toils.

One of the earliest results of the centralizing policy of the Vatican had been the exemption of the monasteries from the authority of the bishop within whose diocese they were situated, and the transfer of the duty of visiting them to special visitors appointed at irregular intervals by the Pope. Perhaps nothing contributed more to the undue relaxation of the austerity of monastic life than this spasmodic style of visitation. By the Act of Supremacy, A.D. 1534, authority in all matters ecclesiastical was vested solely in the Crown, and the right of the visitation of monastic orders passed from the Pope to the King. Warham and other bishops had, however, been sometimes appointed by the Pope as special visitors, and there seemed a likelihood that the bishops might again undertake the work. It is doubtful whether Henry VIII. feared most that the bishops would set matters to right within the monasteries, and thus remove his *causa belli*, or would connive at the abuses they might find existing therein. Whatever may have been the motive, it is certain that before Henry VIII. sent out his visitors on a general visitation, to enquire into “the morals and money, the virtues and valuables, of the religious,” the bishops were, by law, forbidden to visit any monastery church during the proposed general visitation.

In 1489 A.D., on the request of Cardinal Morton, then Archbishop of Canterbury, innocent III. had issued a commission

for a general investigation, throughout England, into the behaviour of the regular clergy, assigning as the cause "credible reports" of the immorality of the monks. In 1535, on a similar pretext, the new "supreme" head of the church follows in the footsteps of the old head of the church, and commissions general visitors with large powers. In the reign of the fourth Henry, the House of Commons had petitioned their king for the secularization of all monastic property. What more natural than that the eighth Henry should have still been "constitutional" and utilized his pliant Parliament to pass his acts of suppression? Nay more, the very man who had been Wolsey's right hand in the earlier partial suppression, Cromwell, the deadly foe of monasteries; Cromwell, who looked upon them as outposts of papacy, as anachronisms, as having no place in the personal system of government he was then trying to establish; Cromwell, daring and uncompromising, was then in the very hey-day of his power, master alike of Church, and Parliament, and nation.

Mr. Froude would lead us to believe that, in earlier times, monasteries were ideally perfect, but had latterly sunk into such a state of moral turpitude that nothing but their complete suppression was any longer possible. Mr. Gasquet, though making a few damaging admissions, remains their warm advocate throughout. Mr. Dixon, although holding a somewhat eclectic position, has perhaps approached nearer the whole truth than either, and him we shall mainly follow. In his view, there are evils inseparable from the monastic system, and that these evils had always existed in England is shown by complaints of their immorality and laxity urged by Bede, by Archbishop Cuthbert in the eighth century, by King Edgar in the tenth century, and later by Bishop Fox and by More. The character of the house, he holds, varied with the character of its head. "In the same generation neighbouring houses might display the opposite spectacles of austere devotion and of profligate hypocrisy." He is inclined to think that at the time of their suppression they were in a rather healthier moral state than usual,* and were doing fairly well the work for which they had been founded; but he believes that "the im-

* This is a two-edged statement. It may involve a criticism of their usual previous condition, or an approval of their condition at the time of the suppression.

pulses which had called them into being, had spent themselves long before." "They were often in poverty and debt, and they had often great difficulty in keeping up their numbers.* . . . Many who had entered religion had been forced into it by unfeeling kinsmen at an unfit age, and . . . in their riper youth cried out that they were bound with a burden too heavy for them to bear. Some of the houses were the prey of furious factions."

In proof of laziness and neglect of duty on the part of the monks, Froude draws from Burnet the statement that at Tewkesbury, where there were an abbot and thirty-two monks, payments are recorded to one hundred and forty-four servants in livery, who were wholly engaged in the service of the abbey. According to him they purposely kept less than the statutory complement of devotees, rack-rented their estates, and encumbered and alienated them contrary to their own rules and the conditions of foundation. The monks were also guilty, he asserts, of neglect of the poor, of neglect of hospitality, of simony, of profligacy, and were generally of a dissolute character. He repeats the worst charges of the Comperta and preamble, and sums up in these words: "The case against the monasteries was complete; the demoralization which was exposed was nothing less and nothing more than the condition into which men of average nature, compelled to celibacy, and living as the exponents of a system which they disbelieved, were sure to fall."

Father Gasquet has rested the case for the defence, almost wholly on two points: the doubtful veracity of the visitors, and a criticism of such written evidence as may have been submitted to Parliament or to the courts at the time, and may still be extant in the form of probable extracts or abridgements of these Visitorial Reports.

As to the character of the visitors, it might be urged that many of them held degrees from English universities—"were mostly clerks and doctors of the laws"—which, at a time when education was wholly in the hands of the church, ought to have implied moderate ability and scholarship, together with at least a fair reputation. Mr. Gasquet regrets that the monks should have been slandered by the reports of mendacious visitors. His

* Many writers hold that they purposely kept their numbers low to make the shares larger for each.

charges against the characters of the royal commissioners are as sweeping as theirs are said to have been against the monks.

If the reports of some of the visitors were biased or even false, it is greatly to be regretted; but it was certainly no greater injustice to traduce the character of some living monastics, who had an opportunity of being heard in their own defence, than to condemn in a wholesale manner the character of royal commissioners, three centuries after their death, especially when their reports were acted upon by Parliament, and when the charges of monastic immorality which they made were already in the mouths of almost everyone. Of the commissioners, Legh and Layton, Mr. Froude, at least, claims that they were "as upright and plain-dealing as they were assuredly able and efficient." It would have been more to the purpose if Mr. Gasquet had unearthed some contemporary objections to the trustworthiness of the men, and even this would have afforded only a strong presumption that their reports were false, for a liar often tells the truth when truth happens to be popular.

If it be true, as Mr. Froude urges, that the first intention was reformation rather than abolition, here was an additional motive for truthfulness on the part of those whose work was liable to criticism and revision. The nature of the work of visitation has not been, I believe, fairly taken account of. An investigation into alleged immoralities must ever be a dirty business, and just as it would be unfair to infer the character of a judge upon the bench solely from his charge to a jury impanelled in a breach of promise case, so must it be unfair to judge these men solely by the tone of their reports, without taking into consideration the whole circumstances under which these reports were made.

Again, the Parliament which passed the Act for the suppression, acted to some extent, directly or indirectly, on the information supplied by these reports. The members of Parliament, presumably, had some knowledge of the names and character of the visitors. These members came from all parts of England, from the constituencies where the visitation had taken place. They could hardly, at a time of great religious excitement, be ignorant of the investigation and of the need or needlessness of it, and from their own personal knowledge they

could form a tolerably correct opinion of the truth or falsity of the reports or abstracts of reports submitted to them. It were useless to argue that the evidence adduced by Cromwell alone influenced, or should have influenced, Parliament. Parliament is, it is true, a court, the High Court of the nation, but it is at the same time a popular assembly, and the knowledge of the subject possessed by private members, and gained by experience or careful observation, was as certainly in place in Parliament as it would have been out of place in an ordinary court, where the verdict should be according to the weight of evidence submitted. It may well be doubted, too, whether Mr. Gasquet has called all the witnesses into court, and whether he has not unduly narrowed the field of investigation in assuming that the "crux" of the whole question lies in an examination into the credibility of the visitors' statements and the textual criticisms of so much of these reports as are believed to be extant. He might reasonably be asked for an explanation of the fact that monasteries have since been suppressed in most European countries;* to account for the fact that the later reports of the Jesuits to their superiors substantiate the charges of immorality made by the visitors; and either to refute such specific charges as had been made by the friends of the system—among whom were to be found bishops, archbishops and popes—or to prove that the abuses of which these men complained no longer existed at the time of the Visitation. Above all, he will find it difficult to account for the almost universal popular distrust of, and contempt for, an institution they had once loved but had now ceased to support and extend; and for the indignant cry of "Down with them!" which is said to have burst from the House of Commons when the charges against the monasteries were read. It is weakness to argue that the Parliament of 1536 was not representative, for no Parliament before the year 1830 can be said to have been strictly representative.

The events connected with the suppression, in its various stages have been wrought out by Mr. Dixon with a fulness that

* Monasteries were suppressed in France by the law of February 13th, 1790; in Germany most of those still remaining were suppressed in 1780; in Spain by the law of 21st June and October 11th, 1835; in Portugal by the Decree of 28th May, 1834; and they were finally suppressed and their revenues nationalized in Italy in 1873.

leaves almost nothing to be desired. Mr. Gasquet has performed an excellent service in his arrangement of the various remaining fragments of the original records of the suppression, and more especially of the complaints alleged to have been laid before Parliament by the promoters of the Dissolution.

The Statutes of Convocation, A.D. 1532, unwittingly furthered the plans of the enemies of monasteries. In these the bishops are exhorted to an increase of zeal and to a higher spiritual life. Idleness, illiteracy, neglect of duty and a luxurious mode of living seem to have been generally charged against the monks, who are said to be maintaining fewer residents than according to their original foundation or present income they ought to maintain.

The oath of Succession, for declining which More and Fisher lost their heads, was, when tendered to the religious orders, made even more severe. It contained an additional affirmation that the Bishop of Rome had no more authority in England than any other bishop. It was probably intended to be intolerable, but was taken by almost all, except by the observant Franciscans, whose boldness in denouncing the king's second marriage had already brought them into disfavour with that amorous potentate. This order was thus suppressed nearly two years before the general destruction. Some of the friars were imprisoned, others were banished, and all were expelled from their houses, their places being filled up by friars of the Augustinian order.

Probably no brotherhood occupied a higher place in the public estimation than the Carthusian monks of the House of the Salutation of the Blessed Mary of London, or as they are usually called, the Charterhouse Monks. They were strict, pious and charitable. These monks at first refused the oath, even though they were intimidated by the imprisonment of their prior. Afterwards, however, they weakened and took the oath "so far as it was lawful." In 1535 this order and its branch establishments of Beauval and Axholme petitioned Cromwell for a milder oath than the one submitted to them. For this action, Houghton, their prior, Webster, Lawrence, Hale and Reynolds, were placed on trial for treason. A verdict of guilty was returned and they were hanged and mutilated at Tyburn. The courage of the remaining monks was not daunted by this baptism of blood, nor

even by the execution, less than two months afterward of three other members of the order, Middlemore, Exmew and Newdigate. Mr. Dixon cites these cases as instances of what he conceives to have been the settled policy of Cromwell to break down the system by "killing off the best of the monks and friars, and scattering the rest."

Wearying, however, of these isolated attempts at suppression, and lured on by their success and by the fact that public opinion had not been aroused in defence of the institutions already suppressed, Cromwell issued a commission under the signet of the supreme head for a general visitation of the monasteries. The Visitors* commenced work in October of 1535 D.A., and some seven houses surrendered at once. It is very probable that these were among the more notoriously irregular.

Mr. Dixon thinks that the time at the disposal of the visitors, and their facilities for travel, could not have permitted them to visit more than one-half of the houses, although they reported on the condition of all of them. If this opinion be accepted, it would go far to destroy confidence in the fairness of the investigation or the truthfulness of their reports. He admits, however, (Vol. I., p. 326) that some at least of these commissioners had already visited the monasteries on the "swearing" visitation before they were sent out on the present or "smashing" visitation, which owing to information obtained incidentally on the "swearing" visitation would greatly facilitate their work. Another statement of his would seem to show that though they did not then visit quite all the monasteries they reported on, their reports may have been on the whole correct, and this, too, without having recourse to the "uno omnia disce" argument, for he says that Cromwell's visitors "had been accustomed to the same sort of work on a smaller scale, which the Vicar-General called them to perform on a larger scale . . . and (they) may have brought to light things which, even if highly coloured, may not have been mere calumnies of basest ribaldry." The results of the visitation were in some manner brought before the attention of Parliament. Mr. Dixon suggests that the Act for the suppression only passed through the Houses by the bullying of the

* Some of the Visitors were: Drs. Bedyll, Legh, Layton, London and Petre, and Messrs. Robt. Southwell, Rd. Southwell, Jno. Gage, Elias Price, Jno. Ap. Rice, Rd. Bellasis, Wm. Hendle, Uvedale, Williams and Ingworth.

King. Mr. Froude, ever eloquent, asserts that there was "not a member of either House who was not connected, either by personal interest or by sacred associations, with one or other of the religious houses, there was not one whose own experience could not test in some degree the accuracy of the Black Book, . . . yet there seems to have been neither hope nor desire of preserving the old system." The journals of the session being lost and unreplaceable these two writers have probably arrived at conclusions so diametrically opposed by the exercise of "scientific imagination." Bishop Latimer, who was probably present in Parliament, and who, whether present or absent from his seat in the Lords, would certainly be well informed of the course of events in this matter, says: "When their (the monks') enormities were first read in the Parliament House, they were so great and abominable that there was nothing but 'Down with them.'" Those, however, who have marked the fluctuations of popular opinion, even in great assemblies, will not, in the absence of express testimony to the contrary, consider the above statement to preclude the possibility of a "great debate" after the first ebullition of feeling had passed by.

Upon whatever evidence, uncompelled or coerced, Parliament certainly passed a measure for the suppression of the smaller monasteries, being 27, Henry VIII., cap. 28, and entitled, "An Act whereby all religious houses of Monks, Canons, and Nuns, which may not dispend Manors, Lands, Tenements, or Hereditaments to the clear yearly value of £200, are given to the King's Highness, his heirs and successors forever." It is admitted in the Act that there were "great and honourable monasteries in the realm . . . divers and great solemn monasteries, wherein religion was right well kept and observed." This admission is the strongest defence of the monasteries it refers to, an admission which makes it almost impossible to justify their subsequent suppression on grounds of immoralities at least. It is more than possible that this admission was only a feint on the part of Cromwell to secure the support or neutrality of the Lords Spiritual to his bill, and to blind them as to his subse-

* Father Gasquet, who refuses to admit the truth of the charges against the smaller monasteries contained in the Preamble to the Act, is of course precluded from quoting from the same Act in defence of the larger ones.

quent intentions with regard to their own monasteries. Perhaps they thought that their non-opposition to the Bill would seem to the public mind a righteous intention to leave the guilty to their punishment and at the same time conciliate Cromwell. No better plan of lulling the mitred abbots into a false security, than by the insertion of this clause, could have been devised even by Cromwell. The Act which condemned the sinners on a small scale contained a clause vindicating the more powerful transgressors. The inmates of the smaller houses were to be sent to augment the membership of those larger houses which had not their full quota, or were otherwise "to be given capacities to live honestly abroad." The priors and heads of monasteries were to have reasonable pensions and benefices bestowed upon them, and "the rights of all persons and bodies politic, such as leases, pensions, portions, and annuities, were to be saved." Several reasons have been assigned why the smaller houses were first attacked, especially when the visitorial reports gave some of them a good reputation and laid serious charges at the doors of some of the larger establishments. It is evident that they would be the easiest overthrown, and that they were usually in out-of-the-way places, where public opinion within and without the monastery would not have so powerful a restraining influence, and where inspection would be more inconvenient. It might be urged, too, that if the monastic system had already become unduly extended in England, the easiest way of checking its growth was to cut off the smaller houses. More probably, however, Cromwell began with the smaller houses merely in imitation of the policy pursued earlier by Wolsey.

The Court of the Augmentation of the Revenues of the King's Crown was organized for the work of destruction, but proved to be neither useful nor expeditious. Three hundred and seventy-six of the smaller monasteries came within the scope of the new Act. All of these were dissolved, but under a provision which permitted the rehabilitation of the more praiseworthy, thirty-one were refounded and continued in existence for from one to two years longer. Burnet thinks that this superior longevity may have been due rather to bribes offered to Cromwell and his officials than to the higher moral status of the houses spared.

To turn now to the evidence before Parliament at this first

suppression, it will probably never be settled beyond cavil as to what formed the exact ground of action against the smaller houses. The preamble of the Act contains terrible charges of immorality and waste on the part of the monks, and this probably is a slight résumé of the documents on which action was based. Father Gasquet, however, hazards the opinion that Parliament acted solely on information contained in a declaration made by the king.

Lingard holds that, from the Visitors' "reports, a statement was compiled and laid before Parliament, which, while it allotted the praise of regularity to the greater monasteries, described the less opulent as abandoned to sloth and immorality." Mr. Dixon, more guarded, says, the "Bill was preceded by a 'declaration from the king.'" Mr. Froude boldly accepts the popular view that the reports of the Visitors (or a digest of them) were compiled into what is now generally known as the "Black Book" and in this form laid before Parliament. He quotes the following* from Stanley's "Gleanings from Westminster Abbey" (p. 425): "On the table of the chapterhouse was placed the famous 'Black Book,' which sealed the fate of all the monasteries of England, and sent a thrill of horror through the House of Commons when they heard it." Two questions here arise for solution. Did this "Black Book" ever exist? What early documents, if any, are still in existence which contain evidence that may have come under the notice of Parliament? That the "Black Book" never existed, Father Gasquet seems well nigh convinced, and this partly because there is no trace of the use of that term earlier than the time of Elizabeth, and partly because the book is not now in existence. Granting that both of these statements were correct, the conclusion of Gasquet is still a *non sequitur*. Few of us, now, are careful enough to give a parliamentary report its special designation. To the popular mind all official reports of the kind are becoming "Blue Books." It is not improbable that a digest of the Visitors' reports laid before Parliament should be spoken of by the masses as the "Black Book,"—a name eminently suggestive of its alleged contents,—for many years before this title secured any recognition at the hands of the official and literary classes. Nor is there

* Froude, IV., p. 520.

wanting a theory of considerable antiquity, which purports to explain the fact, that even careful modern research has so far failed to discover this famous document. In the fourth year of the reign of Mary I., a commission was appointed "to examine into the documents, compertes, bokes, scroles, etc., and sundry and divers infamous scrutinies, taken in abbeyes and other religious houses, tending rather to subvert and overthrow all good religion and religious houses, rather than for any truth contained therein." These commissioners Burnet charges with having destroyed the evidence so damaging to the character of the monasteries suppressed. The charge will be difficult to substantiate or to disprove at this late date.

Gasquet points out that the commission was one of inquiry and not of destruction, and cites the late Mr. Brewer as asserting "that there is no trace among the records of this period of any such systematic destruction." What "traces of systematic destruction," it might be asked, would such a commission be likely to leave? Besides the question is not whether there was *systematic* destruction, but whether there was destruction at all. Were the parties appointed interested in having the documents referred to destroyed? What other ultimate aim could have been in view in the appointment of this commission than either refutation or destruction? If refutation, it would be in the interest of the friends of the monasteries to circulate this formal rejoinder as widely as possible. Where, then, is there any trace of this refutation? Where are now the "documents, compertes, bokes, scroles and infamous scrutinies" which they appointed to examine? They, to all appearances, existed then, and if there is no "trace of their destruction," where is the "trace" that they are still extant?

The transaction has an ugly look, but the question is none the less still a puzzling one. It will probably be as difficult for the friends of the monasteries to prove that this commission did not destroy the notorious "Black Book," as it will be for the enemies of monasticism to prove that the "Black Book" is not a myth. It has even been suggested that the Henrician party destroyed the "Black Book," knowing that it contained charges which could not be substantiated. This view is too chimerical for serious consideration, and, partly because it involves an ad-

mission that something of the nature of a "Black Book" actually existed and was destroyed, has never gained much credence. The whole subject of the existence and contents of the "Black Book" is as interesting and mysterious as the famous controversy regarding the correspondence of Mary Queen of Scots.

Apart from the charges contained in the preamble of the Act of 1536, there is in the Cottonian Library a manuscript which is generally thought to contain a small portion of the evidence laid before Parliament. In the Record Office there is also a manuscript entitled *Comperta*,* the first part of which is a copy of the Cottonian one. These *Comperta* are thought to be in the handwriting of John Ap. Rice, one of the visitors; but these documents are not believed to have been submitted to Parliament, in their present form at least, as they are written in Latin. Bale's Fragment, "Pageant of Popes," has such strong points of similarity to the other *Comperta* that it has been thought to be a copy of part of a lost *Compertum*. The title "*Comperta*" is not without its significance, for *Comperta* were usually made on the visitations of the bishop, and were records of the complaints laid by monks against their fellow members. The originals of these *Comperta* are, for this and other reasons which might be styled "internal evidence," believed to have been minutes made in the chapter houses by the Visitors. In addition to these, the Camden Society has recovered, and published some few of the letters written by the visitors to Cromwell during their "careers." These documents, if the statements they contain be true, show that terrible abominations existed in the monasteries. The charges are, it has been pointed out, very vague in character, and the reports of different monasteries vary chiefly in the numbers of the transgressors. One explanation of these facts is that the reports are "cooked"; another theory is that the visitors may have been mechanically following a given routine of investigation prescribed in their "instructions," such instructions usually accompanying rather than forming an integral part of a royal commission; a third theory is that similar unfavourable conditions in various monasteries had naturally produced similar

* Full title, "Compendium Compertorem per Doctorem Layton et Doctorem Leigh in visitatione Regiæ Provinciae Eboracensis ac Episcopatus Coven. et Lichfelden."

evils. Such, then, are the possible data upon which Parliament may have reached a decision to suppress the lesser monasteries. The theory of Mr. Dixon, previously stated, is merely the most probable. The further details of the course of the suppression of the smaller houses are uninteresting.

Few details are preserved of the fall of the greater monasteries. Most of the monks received pensions and went out into the world; some glad of their liberty, others to mingle once more in the busy, noisy world from which they fain would hide away, and to sigh for the lost shelter of the cloister. In many of the larger monasteries there were traitors, who were spies in the pay of Cromwell. In most, there were angry disputings between factions as to the relative wisdom of waiting for dissolution or making a voluntary surrender to the king. Throughout 1538 and 1539, dissolution and surrender steadily went on. Within the space of two days, forty-seven establishments in the north surrendered themselves without waiting for the Visitor. Such surrender would, in 1535, have been an acknowledgment of guilt; in 1539 it was only the evidence of panic and despair.* The session of 1539 is memorable as the last one in which the abbots sat in the House of Lords. Silently and gloomily they sat in their places, while they were legislated out of their official existence. 31, Henry VIII., cap. 6, restored civil rights, almost without exception, to religious persons.

The thirty-first chapter of the same Act was a piece of retrospective legislation, "granting to the king all religious houses and their property, which had been surrendered, dissolved or forfeited since the twenty-seventh year of his reign." The ninth chapter of this Act, which was designated "An Act to use monasteries for the public good," recited many better uses to which monasteries might be put, and empowered the king "to create bishopricks by his letters-patent, to appoint churches and sites to be sees, to limit dioceses, to erect collegiate churches in which all these good purposes might be established, and to endow them as he thought fit instead of the religious houses." The Suppression, which had been suspended during the session

*Mr. Dixon believes part of it to have been due to the severe restrictions placed upon the monks by the Visitor with a view to forcing them to surrender. It is difficult to see that any of the restrictions he has cited are more severe than the austerity of life to which monastics were already voluntarily pledged.

of Parliament, was actively reserved at its close, and went on steadily and ruthlessly until, in the years 1540 and 1541, Tewkesbury, Carlisle, Westminster, Waltham and Canterbury, the last of the great abbeys fell. In all,* 616 monasteries fell under Acts of Parliament from 1536-41, and their revenues have been estimated at a total annual value of £142,914 12s. 9d.

Speaking of this plunder Father Gasquet claims that the Suppression was due to the "greed of great men," and the emptiness of the royal treasury. The property taken was, he says, "a sop to the greedy appetite of a vicious and avaricious monarch and his needy favourites." Certain it is that the king retained possession of the confiscated property as long as possible, and then gradually distributed it among his courtiers. "The end of all," Mr. Dixon rather rashly concludes, "was the enrichment of the rich, the enlargement of the gentry, the founding of new families, the creation of a new nobility."

A Royal Commission visited Ireland in 1539, and suppressed the Irish monasteries, but rather on charges of having oppressed their tenantry than of grave immoralities (State Papers iii. 130). There is little doubt that this distribution of the wealth of the monasteries was one of the causes which contributed to the permanence of the religious system established by Henry VIII. during the first half-century of its existence. The period of the decline of monasticism in England was distinguished by the founding of about sixty colleges, hospitals and schools. The Act which suppressed the smaller monasteries, exonerated forever, from the payment of first fruits and tenths, the universities and the colleges of Eton and Winchester. The fact that, under the new régime every clergyman beneficed to the extent of £100 or more was obliged to maintain one or more scholars at the Grammar schools or universities, was a definite provision which may be set over against the former unregulated practice of the monasteries, in voluntarily supporting scholars in the universities. The absorption of the monks and nuns in the general society of the time must have to some extent diffused knowledge and raised the general average of national

*The houses suppressed have been classified as follows: 186 Benedictine houses, 173 Augustinians, 101 Cistercians, 33 Dominican, Franciscan, Carmelite, and Austin Friaries, 32 Præmonstratensians, 28 Knights Hospitallers, 25 Gilbertines, 20 Cluniacs, 9 Carthusians, 3 Fontevrauds, 3 Minoreesses, 2 Bonhommes, and 1 Brigittine.

culture. But over against these must be laid the positive statement of Latimer, that the rise in rents prevented the yeoman from sending his son to college, and that in 1550 there were ten thousand students less than within twenty years previous. The free monastic schools being closed, the poor found it harder to educate their children and fewer of them received a good education, and, although the rich began to go in larger numbers to the universities, yet the higher culture of the few could not, either from a social or national point of view, compensate for this loss in the general diffusion of the rudiments of education. It is probable, too, that many books were lost in the spoliation of the monasteries, and the reckless vandalism which defaced, and in some cases destroyed, the beautiful abbeys is responsible for an irreparable loss.

Much of the conventual revenues had been derived from parochial tithes which had been unjustly impropriated by the monks. These were not restored to the parish clergy on the dissolution, but passed, in most cases, entirely out of the possession of the church. This was a loss of revenue to the church, but it is worth considering whether the zeal and devotion of the Christian ministry at any time has been in the direct or in the inverse ratio to the size of its endowment. The disappearance of the abbots and priors from the House of Lords, no doubt weakened the power which the church possessed of directly influencing legislation and administration in civil matters, and the number of clerical orders was greatly reduced. Here again, as Sir Roger de Coverley remarked to Tom Touchy: "Much might be said on both sides." Six new sees were, however, created and from this time must be dated the existence of the "Cathedral churches of the New Foundation." The political and social results in the creation of a new nobility have been already referred to briefly, and are too far-reaching in their effects to be considered at greater length in this connection.

As to the economic effects of the transfer of a large amount of land from the collective ownership of the monasteries to the private ownership of individual members of the nobility, the individualist and the collectivist will differ greatly. It is unlikely that this confiscation rendered private property to any appreciable extent insecure, and it must have checked in the most

effectual way alienations in mortmain and the aggrandizement of wealthy ecclesiastical corporations. Probably under the English system of entail, the estates were as little likely to be freely alienated in the hands of the new possessors, as they had been in those of the old. Doubtless, too, the old agricultural customs would linger longest on the monastic estates, and the transfer only hastened economic changes which were already beginning on monastic establishments, and which were inevitable alike under the old as under the new ownership. As far as the monks were skilled artisans or agriculturists, so far would their dispersion disseminate their knowledge, and if they were skilled, industrious and intelligent, their services were sure to be sought after. Since many of the dispersed monks married, there would be a slight acceleration of the rate of increase of the population, which must be regarded as beneficial, since there was not yet any danger of the pressure of population on the means of subsistence, if indeed anything of the kind ever occurs.

The earliest system of poor relief in England was parochial, and a law of King Ethelred and the Witan devoted one-third of the tithes of the church to the relief of "God's poor and needy men in thralldom." But this parochial system soon broke down, and was replaced by relief by monasteries, hospitals, guilds and private parties, without co-operation or personal supervision of the relieved. Father Gasquet has erroneously stated that the monks "knew the circumstances of those they helped." In many monasteries an almoner daily distributed alms in food and money to all who came, irrespective of their needs. Professor Ashley points out that the "shameless beggars" got more than their share, while the deserving poor who were unable, or afraid, or too sensitive to come for relief went unrelieved. The monasteries were not the only means of poor-relief, and it must in fairness be stated that the faults of the monastic poor-relief were for the most part as noticeable in the other agencies. There were hospitals for the destitute and aged, and most of these which were efficiently managed were spared at the Suppression. The religious guilds and crafts also had a system for relieving the destitute of their own number, and among the craftsmen as the pressure was more directly felt the recipients were under more careful supervision. The churches also had a "stock" or store

for the relief of the poor of the parish, which was administered by the church-wardens. In addition to all this there was much private indiscriminate charity, which like monastic charity was on the whole as baneful as beneficial.

It can easily be shown that the relief supplied by the monasteries was insufficient, as it failed to reach all classes of poor, and especially the most needy class, and, what was worse, that it was injurious, in that it gave "sturdy beggars" a livelihood without work. The Dissolution, indeed, "abolished a number of centres of pauperization," and the cessation of such poor-relief as they gave, was one of the happiest results of the abolition of the monasteries. It has been argued that the destruction of the monasteries but little preceded, and therefore made necessary, the Elizabethan Poor Laws; but this is some of those hasty "post hoc, ergo propter hoc" conclusions against which the historian is on his guard. Professor Ashley says justly that "the new Poor Law was called for, not in order to remedy the evils produced by the abolition—so far indeed as it took place—of the charitable institutions of the Middle Ages, but to cope with evils which had grown up in spite of these institutions." It will be safe to concede that the Dissolution rendered more apparent the poverty which existed and temporarily increased the burden of pauperism on the general public. But part of the monastic wealth passed into the royal exchequer, where it postponed and partly removed the need of increased taxation. The change of ownership increased also the amount of property liable to taxation. So far as the change from monastic to private landlordism hastened the introduction of competitive rents, or brought waste or commons land under cultivation, it must have degraded some of the old customary tenants to the rank of paupers, a loss which in general was probably quite counterbalanced by the abundance and cheapness of the means of subsistence due to the greater productiveness of the new methods of agriculture.

The wisdom and justice of the suppression, the methods adopted, the motives of Henry VIII., Cromwell and their agents, have thus been the subjects of the bitterest controversy. Apologists for the suppression do not find it an easy task to defend many of the harsher features of the policy of Cromwell. On the other hand, why did the abbots and other friends of monasticism make no defence? It was not because there were not sufficiently

learned men among them to have done so. Was it because they felt that no defence would avail anything against Henry and Cromwell, that they allowed an institution, which doubtless many of them loved, to be annihilated without a blow struck in its defence? Did they covet infamy so much that they have left it to the chance pen of posterity to vindicate their memory? Or was it because the noblest and best among them knew that no matter how stainless they as individuals were, the moral condition of the monasteries in the time of Henry VIII. was indefensible? Why, too, was there such a widespread attack on monasteries at the time of the Reformation, not only in England but on the Continent? And why, finally, have monasteries since been suppressed, even in those countries which at the time of the suppression remained loyal to the Catholic faith? These are questions which the tardy defenders of English monasteries will find it difficult to ignore or to answer.

Pope Pius IX. made a significant remark on the suppression of the Italian monasteries in his day. "It was the devil's work; but the good Lord will turn it into a blessing, since their destruction was the only reform possible to them."