should also be read the illustrated account of Mr. Maxim's air-ship in the current number of *McClure's Magazine*, and the (also illustrated) account of a German's experiments in man-flying (or, better, soaring) in *Nature* for December 14, 1893. As the last writer well says, here is promise of fine and tolerably safe sport.

58 (11 January 1894) 34-35

HUXLEY'S ESSAYS

Method and Results: Essays.

By Thomas H. Huxley. D. Appleton & Co. 1893.

CSP, identification: Haskell, *Index to* The Nation. See also: Burks, *Bibliography*; *List of Articles;* MSS L 159.40, L 159.47, L 159.59; MS 1389 (draft).

Huxley's collected essays are to appear in nine volumes, of which this is the first. It is well-printed and agreeable to read. An introductory autobiography will serve to remind readers what Huxley's real profession is. He has, to use his own language, "subordinated" his "ambition for scientific fame" to the "popularisation of science" (in his separate treatises) and (in his essays) to an "endless series of battles and skirmishes" with ecclesiasticism and other powers. Intellectual nettles are these essays, suggestive and stimulating to the point of painfulness. Though Huxley is not a physiologist, his branch of science lies near to physiology, and physiology borders close upon metaphysics; and a remarkably well-read man in philosophy (for an outsider) Huxley is. This goes to feed and strengthen his originality, and gives it breadth. At the same time, it greatly heightens the literary interest and animation of his essays. Not that he does not sometimes show that his reading has been hasty, and that the tedious operation of rumination, which is so necessary in philosophical thought, has been a little abridged. Thus, he adheres to the sect of English nominalism—the school of Ockham, Hobbes, Locke, Hartley, Berkeley, Hume, Bentham, and the Mills — without perceiving how antagonistic they are, upon the whole, to the spirit of science. One of the prime doctrines of these men, for instance, a doctrine inherited from the pre-scientific ages, is that all generalization is a *mere matter of convenience*. The scientific man, on the other hand, without theorizing about generals, implicitly holds that laws are really operative in nature, and that the classification he is so painfully trying to find out is *expressive of real facts*. In short, the two classes of thinkers take the *con*, and the *pro* of the question concerning universals. As the printer's devil would have it, Huxley's opinion is expressed on the bottom of a right-hand page and the top of the following left-hand one. We read (p. 117): "Classification . . . is *merely a convenient* [turn over] *expression of . . . facts*"; which sounds like a patch-work of two sentences. He follows the Mills in speaking of Hobbes with an extravagance of laudation which is amazing, as coming from a scientific man. What! will you call that man a great reasoner who could write treatises to uphold a circle-squaring fallacy, and whom John Wallis, hardly a mathematician of the first class, could so utterly demolish as he did? What! will you speak of him as an exponent of the spirit of science who is known in physics only by his peculiarly virulent opposition to Boyle's method

and its results, and whom Boyle, a weakish sort of disputant, laid out so handsomely? Huxley praises Hobbes's "vigorous English"; but Hobbes's style, both of writing and of thinking, as well as the chief substance of his doctrines, is borrowed, or closely imitated, from William of Ockham. Now Ockham was a brilliant thinker, and some people fancy there was something modern-like about his thought. Not a bit of it; another mind so completely steeped in scholasticism of the most intensely wordy kind can hardly be instanced. Hobbes was an original thinker, even if not a very great one, but his method of thinking is scholastic, wooden, what Huxley calls "*a priori*," and anti-scientific in the extreme. Two extraordinary ideas have come to the modern consciousness from Hobbes. One is the association of ideas, which he undoubtedly stole from Aristotle; and the other is the theory of Motives, which, though it has imposed upon the world, is, in the view of many modern psychologists, a mere logical jugglery, a circle-squarer's style of thought.

Two of the most impressive essays in this volume, making a fifth of its bulk, are devoted to the praise of Descartes as the great scientific philosopher of his age. In fact, when Huxley entitles this volume 'Method and Results,' he means thereby to declare that the 'Discours de la methode' is the true exposition of the method of science. More profitable reading than these two essays of Huxley on Descartes the literature of our time has not afforded. Nevertheless, it is impossible that the judgment of history upon Descartes should be reversed. That judgment is that while his geometry was simply the making of modern mathematics, all his other ideas proved utterly unprofitable and unscientific. Prof. Huxley may persuade us to dock the last epithet, but, about the other, history cannot be wrong.

"There are some men," says Huxley, "who are counted great because they represent the actuality of their own age, and mirror it as it is. Such an one was Voltaire, of whom it was epigrammatically said, 'he expressed everybody's thoughts better than anybody.' But there are other men who attain greatness because they embody the potentiality of their own day, and magically reflect the future. They express the thoughts which will be everybody's two or three centuries after them. Such an one was Descartes."

What a thing that to say of a man! And Huxley fairly makes it out. How can it be that, for all that, Cartesianism was scientifically barren, except in geometry, while there so richly fertile? It was a pretty complete theory of logic, nature, and the soul—the three categories under which Hegel has well summed up philosophy. But systematic completeness, as Hegel's own system well shows, is about the idlest decoration that can be attached to a philosophy. The great desideratum for a philosophy, its indispensable condition, was first stated by a thinker whom Huxley treats with uncalled-for *hauteur*—Auguste Comte; that is to say, a philosophy, to be fruitful, must be "positive"—it must lead to unmistakable consequences comparable in great detail with observation. If it does that, and if those consequences are verified to any considerable extent, it will aid the advance of knowledge. It is that which has made evolution, in the definite form given to it by Darwin, a great agent of discovery. But was not this character possessed by the theories of Descartes? Perhaps; but if they were "positive" theories, they were not theories which there was any

prospect of being able to put to the test to any considerable extent, then and there, in the state of mathematics and of observational means which were at command. Hence, though Huxley can show us *now* that the Cartesian ideas had a scientific character, yet, for practical purposes, they had not that character for the men of that time. But this was not their only defect. It has been repeatedly pointed out by students of the history of mechanics that Descartes's theories really grievously offended the very rule of philosophizing upon which he had himself so much insisted. They were not *clear and distinct.* Worse that that—for that, in itself, would not have been fatal—they were not capable of being made clear and distinct. Like the works of many other philosophers, at first glance they seemed beautifully sharp-outlined, but, when closely studied, they were found to be a composite of nebulae which no scrutiny could resolve. They wanted that fundamental perspicuity to which so few writers except mathematicians attain, which consists in this, that, unintelligible as they may seem at first reading, yet when they are closely studied they are seen to be based upon the distinctions which were pertinent to the problem.

In his long and deeply interesting discussion of Descartes's theory that animals are automatons, Huxley manifests the great disadvantage under which a comparative anatomist must labor who is not an engineer, or who has not a practical acquaintance with analytical mechanics. He thinks he makes out very clearly that animals (man included) act like machines. But he uses neither the language nor conceptions of dynamics. Far from convincing a student of mechanics, he leaves him profoundly convinced of the disparity between machines and animals. He talks about "causes," but the student of dynamics has nothing to do with "causes." That a machine could possibly act as a frog deprived of his front brain is described as acting is what Huxley does not make at all clear to a man whose business has lain with machines and with mechanical systems.

Another fifth of the volume is taken up with a review of the Progress of Science in the first fifty years of the reign of Victoria, 1837-1887. Among its many suggestins, we have only space to notice the following:

"The doctrine of evolution, so far as the present physical cosmos is concerned, postulates the fixity of the rules of operation of the causes of motion in the material universe. . . . But it is possible to raise the question whether this universe . . . may not itself be a product of evolution from a universe of such matter, in which the manifestations of energy were not definite—in which, for example, our laws of motion held good for some units and not for others, or for the same units at one time and not at another—and which would therefore be a real epicurean chance-world? For myself, I must confess that I find the air of this region of speculation too rarified for my constitution, and I am disposed to take refuge in ignoramus et ignorabimus."

It is always unphilosophical to say *ignorabimus*, and the shores of science are strewn with the wrecks of such predictions. It is particularly rash to base such a prediction on the circumstance that the author of it would be perplexed to see how the problem is to be made amenable to exact reasoning.

One-third of the volume is taken up with recent essays concerning the general theory of politics. They are very far below the level of Huxley's work of twenty years

ago, and, in comparison, seem almost mediocre, although they contain a good deal of interesting information concerning the history of some of the theories. The pretence that one can see no meaning in the statement that all men are born free and equal, would hardly have been patiently tolerated by our Revolutionary forefathers. Huxley reviles Rousseau as a mere sentimentalist. Of course, Rousseau was a sentimentalist by conviction, and it is quite true that, since he wrote, the world has received terrible proof of the evil of exaggerated sentimentalism. Still, civilization rests, and must rest, mainly upon sentiment. Prof. Huxley seems to pass a sweeping condemnation upon the application of what he calls "*a priori* reasoning" to questions of justice. By "*a priori* reasoning" he means deduction from general principles, such as Rousseau practised; but Huxley's general condemnation of this mode of argumentation makes it incumbent upon him to explain how he would have a court of justice reason. He even goes so far as to sneer at the principle of toleration. Where would Huxley, or any other evolutionist who lived in the sixties, have been without that principle? The principle of toleration is intimately connected with the fundamental principle of science, for it can have no rational basis except the acknowledgment that nothing is absolutely certain. In those branches of physics where knowledge is the most perfect, in metrology, geodesy, and astronomy, no self-respecting man would consent to put forward an assertion without coupling with it his estimate of its *probable error.* What scientific men mean by "science" is not knowledge, but *investigation.* Now the scientific man will not shut off any question whatever as too sacred or too well known for further investigation, and therefore he must tolerate every opinion. But, further, in regard to questions of politics and the like, the scientific man must admit that not only can the true alternative not be certainly named, but also that no formula can be framed all whose possible consequences shall be just; and for that reason it is most desirable that, alongside of the formula which is less erroneous, the opposite formula which is more erroneous should constantly have its advocates, so that it may not be forgotten when the moment comes at which it is to be preferred to the other. In this point of view, what Huxley calls "the pet doctrine of modern liberalism, that the toleration of error is a good thing in itself," appears to be not, after all, out of harmony with the ideas of science.

In the last essay Huxley discusses, in an ever-interesting manner, the opposing claims of Individualism, or *laissez-faire*, and Socialism, or, as he chooses to call it Reglementation, and reaches the easy conclusion that neither can be admitted as an absolute principle. There, rather lamely, he leaves the matter, without making the obvious remark that evolutionism supplies a third political maxim, perhaps superior to either of the others. For, the moment we admit that man was developed from an ape, whether suddenly or by insensible degrees, we are led to surmise that the rudiments of government antedated humanity. At any rate, government must be considered as one of those adaptive characters of the *genus homo* which result from development. This is true not only of government, generally, but of each special form of it, such as the United States Constitution. Now, since the characters of races are generally highly adaptive, and are also unchangeable, except under the operation of those almost cosmical causes which gradually bring

about changes in races, the evolutionary philosopher will not attempt to do more than deflect very slightly the actions of these forces; whence will result a maxim of political conduct something like this: Aid only such changes as are either inevitable or else both natural and beneficial; and so act that those changes may be brought about with the least total harm. If we were to write *integral* in place of *total*, it would make the formula sound more mathematical; and sound is almost everything in matters like this.

Huxley himself has clearly put his finger upon that one of his qualities by virtue of which he has for so long commanded the respect and admiration of the public. It lies "in the conviction which has grown with my growth and strengthened with my strength, that there is no alleviation for the sufferings of mankind except veracity of thought and of action, and the resolute facing of the world as it is when the garment of make-believe by which pious hands have hidden its uglier features is stripped off." The hopes and consolations of religion will, we believe, never be reinstated in their position of authority (if at all) until this lesson of intellectual integrity has been thoroughly learned and accepted with humility.

58 (8 February 1894) 105-107

SCOTT'S FAMILIAR LETTERS

Familiar Letters of Sir Walter Scott.

2 vols. Boston: Houghton, Mifflin & Co. 1894.

CSP, identification: Haskell, *Index to* The Nation. See also: Burks, *Bibliography*; *List of Articles*; MSS L 159.40, L 159.50-51; MSS 1390, 1390(s) (drafts).

These letters unequally cover the time from 1797, when Scott, twenty-six years old, was known only as a young barrister of fair prospects and the author of some poetical translations from the German, down to 1825, the year before his earthquake of calamity They are conveniently separated into chapters, mostly of one year each; and at the beginning of each chapter is inserted a little chronological table of family events and literary achievements. The initial letter urges his suit to Miss Carpenter, whom he married on Christmas eve, three months later; and there are two other love-letters, tender, rational, and honest. Announcing his approaching marriage to one of the friends who might be useful to him, he thus describes his *fiancée:*

"A smart-looking little girl with dark brown hair would probably be her portrait if drawn by an indifferent hand. But I, you may believe, should make a piece of work of my sketch as little like the original as Hercules to me."

He wrote in 1810:

"Mrs. Scott's match and mine was of our own making, and proceeded from the most sincere affection on both sides, which has rather increased than diminished during twelve years' marriage. But it was something short of love in all its forms."