The age of biology : an inaugural address delivered at the opening of the Andersonian Medical School, session 1879-80 / by the President of the Faculty of Physicians and Surgeons of Glasgow.

With kind regards

THE

AGE OF BIOLOGY:

An Inaugural Address

DELIVERED AT THE OPENING OF

THE ANDERSONIAN MEDICAL SCHOOL,

SESSION 1879-80.

BY

THE PRESIDENT OF THE FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

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INAUGURAL ADDRESS

DELIVERED

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GENTLEMEN,—When the Members of the Medical Faculty of this College, some months ago, did me the high honour of asking me to address to you a few words on the occasion of the opening of the Session of their Medical School, which we are now assembled to inaugurate, I could not but feel their kindness in conferring on me so high an honour; and I willingly embraced the opportunity of at least showing that my good wishes towards your Medical School had in no way abated since the time, half a century ago, when I felt proud to hold the position of one of its Professors.

It is impossible for me to look back upon that period without a shade of sadness as I call to mind the bright and ardent spirits that have passed away, but which then shed their intellectual light, and communicated their noble enthusiasm to all around them. Let me just mention their names, once so familiar and so respected within these walls,—HANNAY and Laurie, Hunter and Watt, Armour and Brown, and last, though not least, Graham and Scoular. One only colleague still survives—JAMES YOUNG, the associate of Graham in his teaching, and still and lastingly associated with him by the noble monument which, at his own expense, he has erected to the memory of our great chemical philosopher in St. George's Square of this city.

May I be permitted to mention two other names connected with the early history of this school—the names of two old pupils of whom any teacher might well be proud. The one is David Livingstone, the Christian missionary, the philanthropist, the undaunted and successful explorer of the wilds of Africa. In this place I formed with him a friendship that terminated only with his life. My colleague, Mr. Young, and myself are two of the trustees to whom he committed the charge of his affairs in his absence, and of his children after his death. I often think, with deep interest, of two events in his history that affected me personally: of the one with high satisfaction—that on his brief return to his native land, he and his whole family sojourned under my roof; of the other with deep regret—that I was prevented by indisposition from being present to assist in laying his remains in an honoured grave in Westminster Abbey. My other old pupil is Dr. Benjamin Ward Richardson, the eminent London physician, physiologist, and man of science.

But I have still older associations with this place, that carry me twenty years farther back. In this building, and not many yards from the spot where I now stand, I was initiated in the first principles of the Latin tongue—in *penna*, a pen, and *dominus*, a lord, *ego amo*, I love, and the prepositions *ad*, *apud*, *ante*, and *a*, *ab*, *abs*. My first books were the Colloquies of Erasmus, Cornelius Nepos, or, as we wittily called him, Nip us, and the Commentaries of Caius Julius Cæsar. To understand all this you must know that the building we now occupy, before it assumed the august name of a College, had from time immemorial been the Grammar School of Glasgow, and for a few years previous the High School of Glasgow. Now the former was the better name, because it expressed unequivocally the object for which boys went to the school—viz., to learn grammar; and all experience had shown that by the study of the Latin language that object can be attained more easily and more thoroughly than by the study of any other language, whether ancient or modern. How, then, was this most signifi-

cant name exchanged for the stupid and unmeaning name of "High School"? It happened thus—An Edinburgh gentleman came to Glasgow, and was appointed to be a "Bailie." Like some other Edinburgh people that I have known, he entertained the conceit that everything belonging to Edinburgh was certainly and of necessity preferable to what belonged to Glasgow; and, being a plausible man, he succeeded in persuading the other Bailies and the Lord Provost that they could not be such good judges of the fittest name for a school as the Lord Justice-General, the Lord President of the Court of Session, and all the other Lords of Session, the Lord Justice-Clerk, and all the other Judges of the Justiciary Court. In due time the old school was rechristened as the "High School," to the intense disgust of all those who had received their education at the Grammar School of Glasgow.

I found no little difficulty, on the present occasion, in fixing upon a subject on which I was to address you, as will easily be conceived from the composition of the audience that I have the honour to address. I have to address students who are just beginning, or have not yet finished their medical studies, on some subject connected with medicine; and I must, at the same time, strain my utmost energies to endeavour to say something not unworthy of the acceptance of men of the very highest culture and intelligence—not less versed in the knowledge of the principles of the medical art, than skilful in the application of them in the field of medical practice.

Weighing these opposite difficulties, I take for my subject "The Present Age"—by which I mean the times in which we now live—"considered as the age of Biology: the advantages to the members of the medical profession resulting therefrom; and the correlative duties imposed upon them thereby."

That "there is a tide in the affairs of men" is a proverbial saying, of which the truth and the importance cannot be overrated. It holds true not less of individuals than of nations, that, altogether independent of themselves and their own efforts, there is an undercurrent which is bearing them along

in a definite direction: and that a prudent man for his own interests, and a wise ruler for the interests of those he rules, ought not to disregard that undercurrent, or, if you prefer to say so, that occult influence; but either direct his efforts in conformity therewith, or "bide his time"—that is, reserve his efforts for a more suitable opportunity.

But it is not of these tides I mean to speak; but of another set of tides, easily distinguished from the former, but not unconnected with them,—I mean the tides of human thought, which at one epoch impel the minds of men in one determinate direction, till they grow wearied of it, or have exhausted everything within it that the human mind is capable of grasping; and then they turn with the same unconsciousness as before to some new and unexplored region of thought, or, to change the figure, reopen some old mine that has been found still to contain unexhausted treasures.

It is usual to ascribe these tides or currents of thought to the influence and example of certain profound thinkers, orators, or poets, who arise from time to time to guide the opinions and carry along with them the sympathies of mankind. But who does not see that these great men are themselves merely borne along by common movement, and serve best to show its strength and direction; while the movements themselves are simply the expression of the moral laws by which GOD directs the opinions both of nations and of individuals, and all the events arising out of them, just as by the laws of physics He directs alike with unerring certainty every star that wanders through the heavens, and the stone or sparrow that falls to the ground.

To take one or two examples,—it was thus the revival of letters was brought about. The great scholars of the fifteenth and beginning of the sixteenth centuries, Erasmus, Melancthon, Casaubon, and the two Scaligers led the way, and all the brightest spirits throughout Europe followed after them to inaugurate the age of classical learning. Every man aspired to be a scholar. To admire the classics, to read Latin and

Greek, to write Latin and even Greek verses were the ambition of men of all ranks. Our good King James VI. was brought up under the ferula of George Buchanan, and Queen Elizabeth, of happy memory, read Plato in the original Greek. No wonder if in such times classical learning was the best road to preferment. It was notably so in the church, and had its due influence even in the state.

But this fervour of the popular mind could not last for ever. To study things and not words became the aspiration of an utilitarian age; and just in proportion the popularity of classical learning has been on the decline, and is now about its lowest ebb.

Exactly in the same way, and about two hundred years thereafter, a new era of intellectual activity was brought about. Newton and Leibnitz led the way. They invented a new calculus that gave them wings to soar to scientific heights before inaccessible, and that never could have been approached with the cumbersome scaffolding of the old Geometry. The best men of the day, such as Halley, the two brothers Bernouilli, and Euler, followed after them in their flight; and thus was inaugurated the Age of Mathematics and Physics. Those sciences became the favourite study of men in all ranks and conditions of life; and the methods of mathematics were applied to all subjects, suitable and unsuitable. Of the latter medicine was, perhaps, that in which the failure of demonstrative reasoning was the most signal. I shall give but one example of a medical theorem, and shall hope that my young medical friends may be able to extract more practical benefit from it than their predecessors have ever been able to do. "The square of the PURGATIVE is as the cube of the CONSTITUTION."

To be brief, Psychology and Metaphysics have had their day of popular favour; and Theology, in this country at least, and I believe in no country, ever loses its hold over the minds of men.

Looking to these facts in the history of science, I have often

asked myself, Is medicine never to have its day of popularity? Are the professors of the medical art always to be regarded as quacks, charlatans, and knaves? or, what is worse still, are they to be regarded as men whose hearts have been hardened by their inhuman practice of dissecting the bodies of dead men; and from whom no man, even in his grave, can be safe, although protected by laws specially enacted for that end? or, what is worst of all, are they to be regarded as men whose principles have been so depraved and perverted by education and example as to justify the common adage that "of three physicians one is an atheist?" Such from time immemorial has been the position of the medical profession, and the estimation formed of them by the general public. It is not, then, to be wondered that all to whom medical science is dear have for years back been watching with deep interest some red streaks in the eastern sky, and fervently hoping that they might prove the harbingers of a brighter day. Nor have their hopes been disappointed. Light has gradually arisen to dispel the darkness, and we are now enjoying the clear sunshine of the Age of Biology.

Who were the authors of this great event? They are chiefly living men, who have vied emulously with each other to bring it about, and of whom it would be invidious to mention one and leave out others not less worthy of praise. I shall therefore content myself with mentioning one great name, which will, I believe, meet with universal acceptance; for Cuvier in his own province had no rival in his lifetime, and our best men since have merely followed in his track. It was he assuredly who inaugurated the Age of Biology. It happened thus: He devised a new science, which now generally receives the name of Palæontology. It has for its object the knowledge of forms, animal and vegetable, that have been once endowed with life, but are now found entombed beneath the surface of the earth. Most of them are fossils—that is, they have been converted into stone, and are embedded in the substance of rocks; and almost all of these are extinct—that is, they are

forms that are no longer to be found living on the surface of the earth.

This curious subject, Cuvier, taking advantage of his favourable position in what is called the basin of Paris, wrought out with matchless diligence and consummate skill, and so constituted the new science of Palæontology. Moreover, in the works which he published on the subject, he invested it with such a charm that every one became desirous to know all about it, and thus it became at once a popular study. The great feat was thus virtually accomplished, for it was impossible to have a knowledge of extinct forms without knowing also the kindred forms now living on the face of the earth. The ambition to know Palæontology thus necessitated a knowledge of Zoology and Botany, and the philosophy of these two branches of knowledge is the "philosophie zoologique" of M. Lamarck, who first applied to it the name of Biology.

I must therefore now congratulate all present on the advent of this new and important era in the history of medicine, and more especially my young friends before me, who are likely to derive the greatest and most permanent benefit from it.

But this change of relations which has taken place, or is now being effected, between the general public and the members of the medical profession demands of the latter their most serious consideration, that they may reap from it all the advantages it is capable of affording; that they may defend themselves from the inconveniences and dangers that cannot fail to attend it; and, lastly, and most important of all, that they may direct to the common weal the various public movements involving medical principles that may arise out of it, just as local currents arise out of and accompany the tidal wave.

Allow me, then, to offer you a few suggestions, as I beg respectfully to call them when I address myself to my medical brethren here present; but which I hope I may venture, without arrogating too much to myself, to call words of advice when I offer them, with my sincere good wishes, to the students of this school.

Our first duty certainly is to give a frank and cordial welcome to these newcomers. I can hold out to you no better example to follow than that of the officers of our army, who have received with open arms our volunteer forces, justly regarding them as fellow-labourers in a common cause, and inspired with a like devotion to their Queen and country. Just so we ought to regard and treat the innumerable recruits who are now volunteering, or even obtruding, their services to assist in perfecting the healing art. The old devices of wrapping ourselves up in mystery, wearing skull-caps and college gowns, red cloaks, cocked hats, and silver knee-buckles, can no longer avail us. We must come down to the level on which our new friends stand, and receive their suggestions with gravity and politeness, although we must sometimes regard them as obviously proceeding from men who have had no regular training in all the branches of science which constitute our medical curriculum.

On the other hand, we will sometimes meet with men much superior to ourselves in certain branches of science which they have specially studied. What mere medical man would not willingly receive a lesson on the affinities of plants from Sir Joseph Hooker, or on the affinities both of plants and animals from Mr. Darwin. Liebig was not a professional man, but he did more than any regular physician ever did to elucidate the chemical actions that are continually going on within the bodies of living men.

To great men like these we ought willingly to give place, and receive with deference and thankfulness the lessons they impart to us. But a man may be great in many ways. He may be a king, but we must tell him there is no royal road to learning. Just in the same way he may be a man of the very highest mental endowments, a profound scholar, a dialectician whose powers of reasoning are unequalled, a great orator, or a statesman to whom his country looks up with gratitude and pride. All this and much more is the Honourable William Gladstone, but he is no physiologist. He has nevertheless

thought fit to proclaim himself a Darwinist; but having done so without any competent knowledge of the principles of physiology to guide him, he has carried his speculations upon development far beyond even the most extreme disciples of the Darwinian school. In a paper of great learning and ingenuity, published in the *Nineteenth Century* for the present year, he declares his belief that at the period of the Trojan war men, in advancing gradually from the primeval state towards maturity, had made so little progress in the development of their organs of vision, that they had then merely the perception of light in its various degrees of intensity; and that in a period much less than the 3,027 years that are computed to have elapsed since the sacking of Troy they have acquired the perception, and at length a complete knowledge of the seven primary colours of the rainbow.

Another suggestion I would make is this—that you should study attentively the tidal wave, and the various subordinate currents arising out of it; that you should follow the movement cautiously, distrust it when the current becomes suddenly rapid, and when you see it manifestly running towards rocks and whirlpools strive courageously to stem it both with sail and oar.

Every popular movement is attended with more or less risk, when the object of it is indefinite or not fully understood. In such circumstances a single adventurer proceeds cautiously, and explores every foot of ground as he proceeds. When, again, a number of persons are engaged in the same pursuit, everyone strives to be first, that he may seize the expected prize or get a share of it, or at least may have the glory of leading the way in an important public enterprise. Caution is forgotten, and hidden, perhaps insuperable, difficulties in the way are never thought of or guarded against. It is no longer a rational pursuit, but a movement prompted by human passions—ambition, the thirst for gold, or the love of fame. The history of every age is full of instructive lessons of this kind, but they are all unavailing. It is only the reason of

man that admits of being taught, his passions spurn control.

Let us take two illustrations of this kind, derived from our own times, as these come home to our bosoms more warmly than the transactions of the past, and as the consideration of them may not be without utility.

The first I shall mention is the Milk Movement.

About two years ago Dr. James Russell, a man of the most unquestionable talent and acquirements, and, fortunately for the city of Glasgow and for medical science, holding the important position of Sanitary Officer for the city—this gentleman threw out the idea that milk might be the means of propagating the endemic fever of this country, which we name variously typhoid fever; enteric, gastric, or gastro-enteric fever; dothinenteritis, &c.

Dr. Russell spoke upon this subject with his accustomed modesty, and with the caution of a philosophic mind. He could not indeed do otherwise. He knew well that it was impossible to prove directly that a fever of any kind was ever produced by the drinking of milk. He knew well also that the highest medical authorities—the men most competent to judge from their own experience, and from the careful study of the records of medicine in times past—all concurred in opinion that endemic fevers are of local origin (I have been in the habit for many years past of classifying them and speaking of them as "Terrigenous fevers"): that they vary in different countries according to soil and climate: and that in the same country they vary from one year to another; and, still more, in cycles of much longer duration, from cosmic influences now little adverted to and not well understood. Are we, then, to suppose that the endemic fevers of our own country proceed from causes quite different from those that produce the endemic fevers of other countries: or, on the other hand, are we to suppose that in all those countries the drinking of milk is the common cause of, or at least one of the means of propagating endemic fevers? that it produces the fevers of Cyprus, of

which we now hear so much; the malarious fevers of Rome and Florence; the yellow fever which is now decimating Memphis and New Orleans; and the bubonic plague of the banks of the Nile?

Still further, milk has been known from time immemorial to be a bland, nutritious liquid, and is instinctively recognised as such by all the lower creatures of the mammiferous class; and no attempt has been made to define accurately the conditions under which it becomes deleterious, and only a theory of the very vaguest possible kind has been put forward to account for its transformation.

When we thus consider the question as to the share which milk has in any outbreak of endemic fever occurring in a large city like Glasgow, we arrive at two fundamental facts which are indisputable, but not remarkable for their novelty. The first is, that fever always arises and prevails in a certain district of the town; and the second is that the inhabitants of the said district are supplied with milk more or less exclusively by a certain dairyman, who buys it wholesale from whatever farmers will sell it to him at the lowest price.

Let us now see how in this age of Biology Dr. Russell's new doctrine was received in the city of Glasgow, where in every drawing-room and dining-room questions of sanitary science are familiar topics of discussion. Emotions are strongest in the female mind. Now, what mother could, without apprehension and even terror, see her own darling children drink every morning as much milk as might bring them to the grave? Something must be done, and that immediately. They must strain every nerve, and leave nothing undone in so direful an emergency. They betook themselves, each in her own establishment, to headquarters. Whenever more than a command was necessary they argued, they entreated, they upbraided, they implored—till at length their distracted husbands, finding themselves unable to resist such cogent arguments, rushed forth in a state of desperation; and taking to themselves infinite credit for manly, independent thought, enlightened public

spirit, and decision of character, they marched in one imposing phalanx to the chief magistrate, and demonstrated to him the absolute, urgent, and *imperative* necessity of convening a public meeting, on the earliest possible day, to consider the MILK SUPPLY.

In this way was inaugurated the great movement, which has since extended to every corner of the three kingdoms, and seems for the present to be strongest of all in London. The history of it is simple and natural, and reflects the highest credit on the affectionate feelings and consummate tact of the fair authors of the movement—the Glasgow Ladies. I wish I could speak in the same laudatory terms of their COADJUTORS. But it seems to me that they overstepped their province in delivering an authoritative opinion on a subject of which they know so little as the causation of fevers: and that they acted in opposition to the dictates of their own kind hearts in so perpetuating an alarm in the public mind, and destroying the peace of many timorous and nervous persons, who are entitled to consideration and sympathy. I think, also, that they did not act with their usual courtesy and urbanity when, being desirous of having their hands strengthened for the great work they had in contemplation, they sent a letter to a learned body belonging to their own city—the Faculty of Physicians and Surgeons—requesting them to petition in favour of the principle of a Bill of which they did not explain either the principle or any of the provisions; fearful, apparently, that the Faculty might claim a share of the glory of so great a measure, but not displeased that they should share the odium of the heavy taxation which it would entail. Neither can I approve, although I here speak with much deference to mercantile men, of their Milk Companies: for I can see no good, but only harm, that can arise from interfering with an important branch of industry, and diverting it into an artificial channel in which it cannot possibly continue; while in the meantime they are injuring and perhaps ruining many poor but honest people of both sexes who earn their livelihood by the sale of milk. Last of all,

they themselves cannot possibly approve of the proceedings of certain retailers of milk under the new system who, to catch customers, have for many months past kept the public mind in a state of terror and dismay by means of flaming advertisements in large characters, in which they proclaim that Dr. Russell of Glasgow, and other eminent men, have given "*a mathematical demonstration* that fever proceeds from the drinking of milk.

I now come to my last subject, and as it is the most important by far of all the subjects I have yet spoken of, I have to request a patient hearing and a dispassionate judgment. I am to direct your attention to one of the most remarkable movements the world has ever seen: remarkable for the vast number of persons engaged in carrying it on, and the vast resources which are under its command; and rendered respectable by the high moral and religious character of the men who set it agoing, and of innumerable noble men and women who are now giving it their earnest support, and contributing to its funds with a liberality worthy of the great philanthropic object they have in view—to redeem their countrymen from the sin of drunkenness with all the baleful consequences of that detestable vice.

Strange to relate, this movement has met with the most violent opposition, and has excited the most angry passions, which have resulted in an open civil war: for I cannot confine that name to a contest carried on by deeds of violence: but must include under it a contest carried on by whole hosts of red-hot partisans on either side; and which has now lasted more than thirty years, being renewed every year with more fierce hostility and inveteracy of feeling, as indicated by words sharp as swords, unfair argument, ridicule, misrepresentation, and every abusive epithet that language can supply. At the present moment this contest presents the ominous spectacle of triumphant exultation on the one side, and calm but determined resistance on the other.

Fortunately for both parties in this irritating and apparently

interminable controversy, the age of Biology has at length arrived; and an enlightened public will decide questions which rest on a physiological basis, without passion, on the ascertained principles of physiological science.

The whole argument is comprised in the three following questions, to which a clear and unhesitating answer can be readily given:—Is alcohol food? Is alcohol poison? and, Should the use of alcohol be restricted by legal enactments, as dangerous to civil society?

The first question is this, Is alcohol an article of food? I answer the question in what is alleged to be the Scotch fashion, viz., by putting another question. Is fat an article of food—the fat of beef or of mutton, for instance, or butter, which is quite similar? Now, no physiologist can have the slightest hesitation in answering the latter question in the affirmative, and the scientific answer is in accordance with the universal experience of mankind. Fat cannot indeed produce bone or muscle, but it serves other purposes not less important in the animal economy. It generates heat and vital force. It consists almost entirely of the combustible elements carbon and hydrogen; and these, meeting within the blood-vessels with the atmospheric oxygen absorbed from the lungs and reposited in the blood-corpuscles, gradually undergo combustion, and so give heat and vital force to the body. Now, alcohol consists of the very same elements, varying somewhat in proportion, but alike fitted to undergo combustion within the body, and so produce the same salutary effects. In one respect it is much superior, for it is more immediate in its action, which is of great importance in all cases of sudden emergency. Fat to be absorbed must be first digested in the alimentary canal. Alcohol, again, is at once absorbed into the system, and, pervading the whole body, gives out everywhere its heat and invigorating energy. The sacred Scriptures, and all ancient historical works, attest that from time immemorial wine has been believed by mankind to produce these salutary effects. Who is there at the present day who has attained the age of manhood who has not experi-

enced the same effect in his own person? If any man affirm that he is an exception, I reply that he is an exception also from the great majority of his species in the constitution and susceptibilities of his body.

If, therefore, I am asked whether alcohol be a good or a bad thing, I am bound to answer, in accordance with the evidence of history, and in accordance with my own experience and the experience of many trustworthy men communicated to me, that I hold it to be a good thing—a good gift of God to man, which human perversity alone has converted into an instrument of evil. Now, how should such a gift be received at the hands of the great Giver of all good—*παντων Δωτῆρα ἐάων*? Should we spurn it from us, and declare in our wisdom that it is an accursed thing which we cannot receive: or should we receive it humbly and thankfully, and use it without abusing it; that is, so use it that we may obtain from it the benefits intended for us, and avoid the evils consequent upon abusing it?

It is to my mind, therefore, quite clear that all who entertain these views of the beneficial action of alcohol upon the human body ought to partake of it; that they have a double sanction, moral and religious, in so doing; and that for any man, directly or indirectly, to prevent them from doing it is a wrong action, contrary to the dictates both of morals and religion.

On the other hand, it is admitted on all sides that alcohol taken in excess is a poison, and destroys every year innumerable human lives. It is admitted with the same unanimity that alcohol deprives a man of the use of his reason, and so renders him dangerous to himself and to all who come near him. Alcohol is therefore a full and ever-flowing source of disease, of immorality, and of crime. It is no overdrawn picture to say of alcohol that it fills our gaols and our poor-houses, our hospitals and our churchyards; and that it would subvert civil society in this country altogether, were it not for the vast police force we are compelled to maintain to keep it down.

The state of society I have described, seeing that the cause

from which it proceeds is fully ascertained, surely presents a wide and promising field for wise legislation; and surely all good men will unite in asking, nay, in demanding, such legislation from Government. Quite the reverse. Two great parties cannot agree upon first principles, and therefore they do nothing. The noble band of philanthropists who, from their long and arduous struggle in the cause of humanity, are so well entitled to lead the way in this all-important work, will admit of no compromise, and have nailed their colours to the mast. They require and can accept of nothing short of total abstinence from all alcoholic liquids. This requirement will never be acceded to by the vastly more numerous body of plain men, with less enthusiasm but perhaps as much thought about them, who feel in their own persons that alcohol does them good, and many of whom have besides a rational conviction that it is a substance eminently fitted to act beneficially on the human body. Such is the unfortunate dilemma in consequence of which all legislation has become impossible. Meantime the wheel goes round; Drunkenness and Crime shout together in triumph, Misery and Disease groan aloud in despair, and Death consigns forty thousand victims to the silent grave.*

A crisis more deplorable, and more disastrous in its moral and physical bearing, is not to be found recorded in the annals of history. But let us take courage, and even be of good cheer. The age of Biology has arrived: and when we can clearly trace the finger of Providence in the train of events that ushered in the dawn, let us devoutly trust that the same Almighty Power will bring also the full brightness of noonday. The mists of error and prejudice in which both parties are now enveloped will at length be dispelled; good men will see and recognise each other, and, joining hands like brothers, will act in concert in framing a code of wise laws for the repression of Intemperance.

* Annual mortality from Alcohol, as estimated by Dr. Richardson, in his Inaugural Address to the British Medical Temperance Association, 1879.

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