The Hunterian Oration

THE COMMEMORATION OF GREAT MEN*

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I

Events that recur with a regular period are apt to be taken as a matter of course, to have their significance regarded as obvious and to seem in no need of justification. To resist this tendency to confuse the familiar with the self-evident is one of the most necessary efforts the mind is called upon to make. The institution whose recurrent activity we take part in to-day was set up 119 years ago and marks a birthday since which 204 years have passed. For more than a century orations have been delivered on the life and work of Hunter and they have explored their theme from every aspect and adorned it with every art. The high qualities of these orations make it impossible for a new contributor without special aptitude to hope for any freshness in the presentation of a topic already so well discussed by better men. On the other hand the imposing length of the series may perhaps have a little obscured our apprehension of the more elementary meanings that underlie these regularly returning occasions. Under the pressure of these converging indications it will be my relatively humble task to seek answers to such questions as the first giver of this oration might be supposed in his preliminary musings to have put to himself. What are the reasons, we shall want to know, why John Hunter should be regarded as a fit subject for enduring celebration, and what do we wish and what do we attain in the many activities by which in general we pursue or suppose ourselves to pursue the commemoration of great men.

II

To question established beliefs is nowadays perhaps a rather old-fashioned activity. We may be sure, nevertheless, that it is one of which Hunter would thoroughly have approved even if his own greatness was to be in question. In that case, however, if we are to judge by his known methods in controversy, the discussion would go all the smoother if we hinted beforehand what the verdict was to be. For of the verdict there can be no doubt, and it will find that the makers of this recurring celebration not only chose an exceptionally sound foundation but built perhaps a great deal better than they knew.

Hunter was a successful surgeon with a large practice and a correspondingly ample income. It must not be suggested here that that is anything but highly respectable attainment. It is not, however, attainment that, under any magnification or however many ciphers may be subtracted from the mortality of his patients and added to his income, reveals in its creator the heroic features we are seeking.

Hunter made the museum which for over a century has been the very focus and palladium of this College. In this work we find the giant energy and resolution of true greatness directed by a correspondingly clear and ample idea. It was no mere miscellaneous assemblage of odds and ends as the collections of his contemporaries tended perhaps a little to be, but a grouping of orderly series nobly illustrating the living world and the processes of disease. It is scarcely possible for the richness and order of this historic monument to be spoken of too highly, but it may be doubted whether in themselves they could have given to their creator his unique and enduring prestige.

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Hunter was a consistent and expert user of the experimental method in the study of living processes, and it is on this fact that his fame essentially and ultimately rests. It was by impressing this method on his pupils and successors that his services to science and to surgery have had their most extended and their richest effects.

These experimental studies covered a very wide field and dealt with fundamental problems such as the process of repair, the survival of isolated tissues, transplantation, grafting, inflammation, the processes of growth, and the influence on them of the sexual glands. Such researches were pursued with a characteristic zeal and ability, and yielded results of importance in many directions. It is impossible, however, not to be struck by a certain disproportion between the amount of energy and genius that was expended and the harvest of substantial knowledge that was gathered. Many of the researches were indecisive, not a few of the conclusions were incorrect, and no single advance was won which could be said to mark an epoch in the history of knowledge. Every student of Hunter is convinced that he belonged to the very small class of those who possess powers of the first order ; few can be equally convinced that he made a direct contribution to the science of his day fully commensurate with his splendid gifts. It is therefore particularly happy that his commemoration should have been formally assured and entrusted to an enduring institution. Other experimental workers in the science of life, more fortunate but perhaps not more richly endowed, have by their labours so contributed to the very structure and substance of knowledge as to be sure of remembrance without any specific memorial. Of Harvey, of Pasteur, of Lister every student of physiology or pathology is in some sense the beneficiary and direct legatee. The influence of Hunter was more limited to the indirect and germinal ; he did not make an epoch, he founded a school.

III

That Hunter's prodigious powers and devotion yielded such comparatively moderate accessions to knowledge is perhaps not without a certain shade of mystery and pathos. It is an idle occupation for the common man to busy himself with explaining the successes and failures of greatness, but it is no undue presumption to turn our attention to the circumstances of Hunter's life in the search for light upon his career. He was so resolutely modern in his attitude towards the problems of life, and he accepted so whole-heartedly the working hypothesis of their solubility, that we are apt to forget the state of knowledge of his time. During the 65 years of Hunter's life from 1728 to 1793 the biologist could look for practically no help from the sciences of the inorganic, and was without almost every article of equipment we now regard as essential to experimental work.

We are accustomed to associate with the earliest foundations of modern chemistry and physics the great names of Cavendish, Priestley, Galvani, Volta, and Lavoisier. Every one of them was junior to Hunter. Let us for a moment regard the situation of Hunter in his prime in 1765. He would have had to wait 10 years for Priestley's discovery of oxygen in 1775 ; he would have had to wait over 60 years for Wöhler's synthesis of urea and the foundation of biochemistry in 1828, and nearly 80 years for Joule's mechanical equivalent of heat. Over 60 years ahead was Joseph Jackson Lister's completion of the compound microscope, which made possible the science of histology, and exactly a century away the proof of the nature of wound infections by Lister's greater son.

In this atmosphere of embryonic science and primitive equipment Hunter worked with high faith and energy at problems which have resisted, or yielded only grudgingly

to, all the resources of the modern world. Not only was there little help for him in the general body of science but biology itself lay in a certain sense between two tides of inspiration. The gross structure of the animal body had been fully exploited by the great anatomists; the stimulus this had given to knowledge had come to the flood and was ebbing fast. Exact histology lay half a century in the future, and for the want of it most of Hunter's experiments could not be given full exploitation or carried to exact conclusions. It needs all our imaginative sympathy to picture the twilight country in which his labours were carried on—the air is dim and thick, the range of vision short, the appearance of things ambiguous,

—"the tired waves vainly breaking
Seem here no painful inch to gain."

We can scarcely resist the sense that there was a prophetic element in the feverish energy with which he set himself to his tasks. For events were to give to such work a new value and a new necessity. The long climax of the eighteenth century was passing by. Ahead lay a changed order where social structure would have an unheard-of complication and biological problems an unheard-of urgency. The world seemed to pause, gathering itself for the plunge. The movement would be slow at first but presently would take on a vertiginous acceleration.

In 1774, when Hunter was 46 and in the full tide of work, a young Scotchman named James Watt left Glasgow for Birmingham to become the partner of Matthew Boulton and with his help to add to the gathering forces of the industrial revolution the immense momentum of the steam engine. There followed a commercial expansion and a crude industrial hypertrophy which made this country the envy of the world, but which we can now contemplate with only a qualified pride. The growth of trade and population was so imperious and so exuberant that the ordinary hygienic difficulties of social life increased out of all bounds. Industrial areas of population grew unchecked by regard for space, for decency or for health, while the discrepancy between the rate of development of mechanical and biological knowledge became more and more dangerously wide. The great, but as we can now see rather Grecian, gift made by the North to the South when James Watt brought the steam engine to England, was to be repaid in a nobler and less equivocal form when 86 years later a young Englishman named Joseph Lister went to Glasgow. The industrial revolution and the steam engine had done their work. To the great new industrial populations hospitals had become more and more indispensable, and with every enlargement of their activities they had become more and more dangerous to their surgical patients. The process was a progressive one for a reason that is now obvious, the frequent occurrence of infection from patient to patient being ideally suited to raising the virulence of micro-organisms to the highest pitch and maintaining it there. Surgery in hospitals was in fact already threatening to become extinct.

It was in this darkest hour that the method of Hunter brought off its greatest stroke. Of that method Lister was a devout and explicit disciple. In five years from his going to Glasgow he had solved the problem of wound infection and modern surgery was born.

The lapse of time with its slow revelation of perspective and proportion in the succession of events, seems more and more clearly to teach the lesson of Hunter's career. It was not as a surgeon, as the maker of his great museum, or even as a discoverer in science, that his greatness was revealed or his influence perpetuated. It was by his example in the use of the scientific method—faithfully, in purity of heart, and with utter devotion to truth.

IV

We cannot examine even in this hasty way the special instance of a given memorable man without feeling a logical pressure towards the consideration of the more general case, of the meaning and motives that underlie one of the most widespread of human impulses. We assume that the commemoration of heroes is possible and to be desired, and it would perhaps be well in prudence to leave it at that, for the moment we pierce the smooth surface of the assumption we find ourselves in a world of ambiguities and uncomfortable hints. Nevertheless it is perhaps a healthy exercise in an environment such as this—so solid, so stable, so justly confident—to recall to ourselves sharply that these also are appearances.

Let us begin by planting squarely before us the plain fact of death. I make that specious request not in the expectation that it will be granted, for it is in the very nature of that fact's relation to life that we cannot get a square, collected, and as it were binocular look at it. A living mind can form no intimate conception of its own death, and is apparently for ever incapable of comprising two categories which are not opposites, as is often crudely supposed, but superlatively different. And yet in the world of gross reality the expectation of death for the individual is the one prospect for which the attestation of experience amounts most nearly to philosophic certainty. This radical antinomy in the life of every conscious being, in spite of having been the chief preoccupation of the speculative mind since it came into existence, remains and must remain unresolved. Among the by-products of these secular activities is the strange jumble of sense and fantasy that makes up our attitude towards the memory of the dead.

In even its most sober and enlightened moments mankind has regarded the dead with fear and pity. In other moments the feeling has risen to awe and reverence, or has sunk to a strange blend of horror and contempt. The mixture of feeling has withdrawn attention from the central fact, that from the moment of a man's death the memory of him begins to fade, for he has entered on a new state about which the only certainty is that it has nothing to do with life. Nothing can arrest this decline, no memorial can do more than delay it and as it delays distort. In all our commemorations, whether by word or by plastic art, we make our own pictures and drift increasingly away from the actual man. These are the real ghosts, and nothing brings more certain conviction of a man's death than his memorial. This steadily increasing divergence between the subject commemorated and the object commemorating has perhaps its consolations when we view the objects of memorial art in our public places. At any rate we may tell ourselves as we shrink before the marble frock-coats and the bronze beards and whiskers, their supposed subjects could scarcely have been like that. However forlorn in the eyes of mere reason the task of keeping in being the veritable personality of the dead, mankind has addressed itself to this object throughout the ages. And its efforts have always illustrated the twin themes of pity and fear. The hunter warrior must have his weapons and his dogs with him in the grave, the head of the house his servants and his wives, and both their finery and their food. So they would be happy and at ease and the bereaved could feel a little comforted; and if they were happy and at ease perhaps they would not come back.

When the dead man is a great man, another theme is added revealing motives with the same rich human mixture of the noble and the base. The qualities of the hero are worshipped, are desired, and are pursued with devotion and without scruple. Primitive man seems very early to have thought the most obvious way to assimilate the

virtues of the hero was to assimilate his body, actually to eat his flesh in the expectation that the spirit which had animated it would also be conveyed and absorbed—a robust conception of organotherapy than we have yet come back to. Hence arises the commemorative feast which has penetrated Western civilization with what huge significances we know. A second idea which belonged more definitely to the realm of magic was to make an image of the hero, and so preserve his personality without limit; thus the qualities most desired could be judiciously magnified, and above all the whole conception was under control.

But the primitive mind with its dangerous gift of logic could not leave the subject without a further rational expansion. If heroic virtues are transferable at death, must one wait upon the operation of mere natural processes? We need not doubt that the plain conclusion has been on due occasion reached. When the slayer was assured of acquiring the virtues of the slain, the crazy logic of memorial piety had reached its climax. This dark theme wanders elusively in the customs and folk-lore of early man, and has its classical seat where in the shadowy southern woods we discern the enigmatic figure of the Priest of Nemi with the Golden Bough.

It would be easy to fall into absurdity by making crude and over-simplified applications of these primitive modes of thought to our modern affairs. Nevertheless we must not forget the ingrained conservatism of Nature; physiology has shown to how large an extent the fundamental chemistry of the body and the elementary working of the nervous system tend to be uniform throughout the animal world.¹ There is good reason to suppose that the same kind of elementary uniformity obtains and has always obtained in the reactions of men's minds. If the ideas we have indicated occurred in primitive minds we may be sure that manifest or latent evidences of them will be found in our own. At any rate we cannot deny that the commemorative feast has its part in modern memorial celebrations; or that man still likes to make magic images of his heroes—though there may be little enough magic about some of them—and to magnify the features he thinks they ought to have, and suppress the others.

It would partake too much of the nature of the over-strained ingenuity I have already deprecated, to enlarge upon the traces of what we may call the Golden Bough theme that are to be found in the treatment by society of its men of exceptional character and capacity. Such traces are to be met with but they are perhaps too elusive to be put into words without an effect of crudity and exaggeration.

V

The *conscious* and *ostensible* motives under whose influence we approach the commemoration of great men are first, to contemplate in humble piety and emulation a largeness of mind and character that far exceeds our own, and secondly, to seek inspiration from struggles heroically engaged and perhaps triumphantly won. There is no commoner mistake in practical psychology than to suppose that because a motive is admirable it must therefore be strong. If we are to be honest with ourselves we shall have to admit that aspirations such as these do not accompany us very far along the humdrum and ignoble ways of daily life. Many of us must have felt guiltily conscious of how little the exhilaration produced by such exercises has been able to compete with the anxieties and ambitions of our own pedestrian lives. Side by side with this weakness in our conscious motives, there is, as I have hinted, reason to suspect the presence of other and submerged impulses, the vestiges of a cruder, harsher type of feeling, which for all their dimness may have a certain ugly strength. When we

remember in addition the difficulty of establishing and keeping alive the true and unadulterated personality of the dead, we must, I think, confess that the art of ceremonial commemoration has to overcome obstacles of a very formidable kind if it is to avoid becoming increasingly formalized and superficial.

It is possible that a future and more realistic age may reach the conclusion that the time to celebrate its heroes is while they are alive, and not to wait with our remarkable patience until they are safely dead. Such an age will perhaps reason in its clear way that its duty towards its great men is to get as much out of them as it can, and that no piety after their death can equal in effectiveness for the purpose a receptive and sympathetic understanding during their lives.

VI

It is unfortunately very much easier to recognize a man's greatness after he is dead and when we are freed from the distraction of the actual presence which unhappily tends so often to be odd, angular, and even quarrelsome. It is also an old story that the reception of new ideas tends always to be grudging or hostile. The text is a favourite one and is apt to become the theme of exhortations which, in addition to having the dreariness of their kind, are pointless because they constitute a frontal attack on an ingrained quality of the mind.

Apart from the happy few whose work has already great prestige or lies in fields that are being actively expanded at the moment, discoverers of new truth always find their ideas resisted. The consideration of this process is often obscured by two assumptions: first it is supposed that the most harmful resistance comes from obvious and noisy prejudice and that the more dangerous resistance of inertia and quasi-rational negation is unimportant; and secondly, it is supposed that workers in science are of course free from any resistive tendency but a rational conservatism. Each of these assumptions is an almost complete delusion.

The vociferous opposition met with by the ideas of Charles Darwin and of Lister probably did nothing to hinder the spread of these, and probably brought them within reach of a larger number of people capable of accepting them than would have been the case if the opposition had been well behaved. Again it was not noisy prejudice that caused the work of Mendel to lie dead for 30 years, but the sheer inability of contemporary opinion to distinguish between a new idea and nonsense. That this same inability may be shown even by the most eminent workers in science scarcely needs demonstration for anyone at all aware of the history of knowledge, but it may be illustrated by an anecdote which we owe to the third Lord Rayleigh and which is to be found in the delightful *Life*² of that very great and wise man. J. J. Waterston was an engineer who interested himself in mathematical physics, and in 1845 wrote a paper on the molecular theory of gases which was 10 or 15 years in advance of his time and anticipated much of the work of physicists no less eminent than Joule, Clausius, and even Clerk Maxwell. The only contemporary judgement on this paper that survives is that of the referee of the Royal Society to whom it was submitted. He said, "The paper is nothing but nonsense." What Waterston might have accomplished if he had had the recognition and encouragement upon which this genius seems to have been unusually dependent, is beyond conjecture. He did not get them. His work lay in utter oblivion for 45 years until it was exhumed by the pious efforts of Rayleigh. He himself lived on disappointed and obscure for many years, and then was overtaken by a yet deeper obscurity, for as the result of some strange accident or a long

gathering impulse of despair, he disappeared and left no sign.

This little story must strike with a chill upon anyone impatient for the advance of knowledge, and especially upon such as are inclined to assume the use of the scientific method to be synonymous with the possession of the scientific mind. Experience fully proves that this assumption is unsound, for there is no limit to the narrowness of the field within which the scientific method may be limited while the rest of the mind is uninfluenced. Even if that assumption is not maintained there are several grounds on which has been defended the proposition that a man of science does well not to traffic very freely with new ideas. It is thought that the necessary concentration on a limited problem is apt to be attenuated by the use of any general intellectual activity. A proposition more worthy of serious attention is that which declares that scepticism and suspended judgement are the very essence of the scientific mind and scarcely to be depended on too much. The conception is no doubt true when its elements are exactly defined. Without such definition these venerable phrases may very easily become mere snares; this is because they are apt to be the expression not of the principles they profess to represent but of far more deeply ingrained and potent impulses.

The mind delights in a static environment, and if there is any change to be itself the source of it. Change from without, interfering as it must with the sovereignty of the individual, seems in its very essence to be repulsive and an object of fear. A little self-examination tells us pretty easily how deeply rooted in the mind is the fear of the new, and how simple it is when fear is afoot to block the path of the new idea by unbelief and call it scepticism, and by misunderstanding and call it suspended judgement. The only way to the serene sanity which is the scientific mind—but how difficult consistently to follow—is to give to every fresh idea its one intense moment of cool but imaginative attention before venturing to mark it for rejection or suspense, as alas nine times out of ten we must do. In this traffic it is above all necessary not to be heavy-handed with ideas. It is the function of notions in science to be useful, to be interesting, to be verifiable and to acquire value from *any one* of these qualities. Scientific notions have little to gain as science from being forced into relation with that formidable abstraction "general truth." Any such relation is only too apt to discourage the getting rid of the superseded and the absorption of the new which make up the very metabolism of the mind.

VII

In making this small survey of the simpler reflections that are suggested by commemorative occasions such as this, three general conceptions have presented themselves rather prominently. Some of them at least have a practical bearing and we should therefore be very unworthy disciples of the Master we celebrate if we did not give them what point we can by a particular reference.

The first of these ideas is the familiar truth that if any human institution is looked into at all closely it is found, however admirable its ostensible purpose, to be built out of a strange mixture of elements and to comprise motives many of them odd and some of them ugly. Memorial ceremonies show themselves to be of this class, and thereby demonstrate that they possess a thoroughly natural origin. In these mild disclosures there is nothing to dismay, and no one need be disconcerted by the homely skeletons in the cupboards of folk-lore. At the same time they perhaps have a use in explaining why the stimulation and enlargement of mind afforded by such commemorations are sometimes less potent than we could wish.

The second conception that emerges is the suggestion that with the process of time it will become increasingly difficult to separate the commemoration of the dead from the responsibility for their treatment during life, or to believe that posthumous honour is in any real sense a reparation for the dead, or a discharge of the liability of the living. It will become less and less possible to regard the discoverer of truth as responsible for the propagation of it, and charged with the duty of converting a stiff-necked generation.

The third and last idea on which our discussion has converged is that if mankind is to profit freely from the small and sporadic crop of the heroically gifted it produces, it will have to cultivate the delicate art of handling ideas. Psychology is now able to tell us with reasonable assurance that the most influential obstacle to freedom of thought and to new ideas is fear; and fear which can with inimitable art disguise itself as caution, or sanity, or reasoned scepticism, or on occasion even as courage.

We may now attempt for a final moment to link these speculations with our primary theme. In his mental environment Hunter must be regarded as a happy man. He lived in the relative intellectual freedom of the best part of the eighteenth century, before its bland sunshine had died in the smoke of industrialism, and before the French Revolution and the reaction to it had deadened speculative thought. He saw, as from a peak in Darien, the illimitable ocean of biology before him and he addressed himself unhesitatingly to explore it all. It was in the general level of knowledge and in instrumental equipment that he was less fortunate. When a new Hunter appears he will not be held back by an undeveloped science and he will find this College able to give him all the facilities with which it has been munificently endowed. Let us hope that he will also find an intellectual environment where even his most revolutionary ideas will be planted in a nourishing soil and bathed in a genial air.

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- ² *Life of Lord Rayleigh*. London, 1924, pp. 169 et seq.

HIGH BLOOD PRESSURE AS AN EARLY SIGN OF TOXAEMIA OF PREGNANCY*

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The purpose of this paper is to call attention to the fact that an elevation of blood pressure in toxæmia of later pregnancy may precede the appearance of albumin in the urine.

Mahomed (1874) appears to have been the first to demonstrate that "increase of tension on the arterial system" might precede the albuminuric stage in the glomerulo-nephritis following scarlet fever. At that time, however, there was no very accurate method of measuring blood pressure, and Riegel (1884) stated that the albuminuria and the rise of blood pressure were almost synchronous. In 1925 Koch, supporting Volhard's theory of a generalized arteriolar spasm as a cause of ischaemia and consequent injury to the kidney, stated that during convalescence from scarlet fever there occurs, in the majority of cases, a rise in blood pressure, as a "consequent or concomitant phenomenon of the immunization processes going on in the body." This, he said, might after a day or two fall to normal without further demon-

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