DAVIS (N.S.)

Address on the Character of Dr. Edward Jenner and the History of his Discovery of the Protective Value of Vaccination.

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ADDRESS ON THE CHARACTER OF DR. EDWARD JENNER AND THE HISTORY OF HIS DISCOVERY OF THE PROTECTIVE VALUE OF VACCINATION.

BY N. S. DAVIS, M.D., LL.D.

According to reliable authorities the subject of this address, Edward Jenner, was a native of Berkeley, in Gloucestershire, England. He was born May 17, 1749. His father was Rev. Stephen Jenner, who was rector of Rockhampton and vicar of Berkeley. He was the representative of an honorable family long established and owning some landed property in that county. His mother belonged to an ancient family in Berkshire. The father died when Jenner was only 6 years old, thereby leaving the care and education of Edward almost wholly to his older brother, Rev. Stephen Jenner, who appears to have assumed and executed all the parental duties relating to the younger brother with the utmost fidelity and tenderness. The early education of Edward was in the schools, chiefly at Wotton-under-Edge and Cirencester. During this time he developed so much fondness for natural history as to attract special attention, yet he was never behind in any other studies required. At the age of 14 it was decided that his further education should have direct reference to his entering the medical profession. Consequently he was apprenticed to Mr. Daniel Ludlow, a surgeon at Sudbury, near Bristol, for the purpose of studying surgery and pharmacy. It was during this apprenticeship that he heard a young woman, a milkmaid of the neighbor-

hood, say to Surgeon Ludlow that she could not have the smallpox because she had previously had a cowpox sore on her hand contracted while milking. The remark was such as to indicate a prevalent belief among some of those engaged in milking, that there sometimes existed on the udders of the cow a sore or pustule the matter from which, if placed in contact with an abrasion on the hand of the milker, produced a peculiar sore, leaving a permanent scar and rendering him or her ever after immune to the contagion of smallpox. No attention was given to the remark by the surgeon, who like all his confrères regarded it either a mere accidental occurrence, or a superstitious vagary of the common people. But it was far otherwise with his young apprentice, Edward Jenner.

Endowed with the highest order of mental acumen, coupled with an equally high order of benevolence, and already trained to philosophical study, the simple remark of the milkmaid at once and indelibly fixed in his mind the question whether it did not point to a possible preventive of that most dreaded scourge of the human race, smallpox. Jenner never abandoned the idea of solving the question until he had completed its solution thirty years later. But with no accurate description of the alleged infectious sore or pustule on the cow's udder, and the fact that it was met with only at irregular intervals, he was limited during his apprenticeship to the gathering of such items of information bearing on the subject as might come within his reach. In the meantime he not only pursued his studies in surgery and pharmacy with diligence, but he seems to have devoted every available hour to further studies in natural history directly in the open field of nature, observing the habits of living animals, gathering fossils, and acquiring unusual skill in drawing. At the expiration of his seven years of apprenticeship with Surgeon Ludlow, in 1770, at the age of 21 years he went to London for the further prosecution of his medical studies. He entered as a student at St. George's Hospital and became a private

pupil of the celebrated John Hunter, in whose family he resided during the next two years. During this pupilage he early displayed so much skill and accuracy in making preparations of anatomy and natural history, and in dissecting delicate structures, both natural and pathologic, that he rendered much aid to his preceptor. So marked were these attainments that through the recommendation of Mr. Hunter he was employed by Sir Joseph Banks to arrange the valuable specimens, zoölogical and otherwise, gathered by Captain Cook during his first voyage of discovery ending in 1771. He performed the work so satisfactorily that he was offered the position of naturalist to the next expedition the following year. But his attachment to his older brother and to his native town caused him to decline this offer, and at the end of two years' study in London he obtained the necessary license to practice surgery and returned to practice in his native town of Berkeley at the beginning of 1773. While with Mr. Hunter, young Jenner mentioned his question of the possibility of making the cowpox a valuable preventive of the natural smallpox and subsequently corresponded with him on the subject. He was encouraged to make a thorough investigation, which he entered upon earnestly in 1775, or as soon as he had become established in the practice of his profession.

The first five years were consumed in fairly identifying the true cowpox vaccine pustule and separating it from other sores with which it had been confounded. During the same time his investigations led him to believe the true cowpox pustule yielded its active virus only at a certain stage of its advancement, and that it, together with the diseases known as swinepox and the grease in horses, were all derived from the action of smallpox contagion on these animals. So firm was his belief in the truth of this, that during a period of unusual absence of cowpox from the neighborhood, he ventured to vaccinate his oldest son with the matter of swinepox and produced in him all the symp-

toms of a very mild case of smallpox. After his recovery he was inoculated with genuine smallpox without effect. This gave him so much confidence in the ultimate success of his investigations that in 1780 he communicated confidentially to his intimate friend, Edward Gardner, the progress he had made and his confident belief that its results would be of the greatest benefit to the human race. In 1788 he carried an accurate drawing of the cowpox sore, as seen on the hand of a milkmaid, to Sir E. Home and others in London, who seemed to regard it as a curious and interesting illustration, but gave no evidence of perceiving its practical importance.

Finally, on the 14th of May, 1796, the long sought opportunity came, and he was enabled to take the lymph from a cowpox pustule on the hand of Sarah Nelmes and with it vaccinate the arm of James Phipps, a boy in good health, and aged 8 years. The vaccine disease passed through its successive stages perfectly and Jenner was surprised at the general resemblance of the the vaccine sores to those of smallpox. About twenty days after the boy Phipps had recovered from his vaccination, his arms were inoculated with smallpox matter without effect. The circle of proof was now complete. The vaccine lymph from the cowpox sore produced the characteristic vaccine on the hand of the milkmaid. The lymph from the vaccine sore on her hand produced the characteristic vaccine sore on the healthy boy, and both proved ever after entirely immune to the contagion of smallpox. Still Dr. Jenner patiently continued two years more in extending and verifying his proofs that there might be no reasonable chance of failure in the complete establishment of his great discovery. He then, early in 1798, wrote in a paper frankly all the important steps of his investigations and the full proofs of his discovery and its inestimable value to the human race, intending to submit it as a communication to the Royal Society, to which he had previously made acceptable communications on other subjects. But

we are told by Dr. John Baron, the chosen biographer of Dr. Jenner, that the president of that Society, Sir J. Banks, advised him to be very cautious, lest such a paper should lessen the reputation he had already gained. Accordingly Dr. Jenner, with a supply of vaccine lymph, went to London for the purpose of directly demonstrating its effects to prominent members of the profession in that city. After tarrying there two or three months without finding a single individual who would submit to the simple process of vaccination, near the end of June, 1798, his paper was given to the world in an unpretentious pamphlet, dedicated to his friend, Dr. Parry of Bath, and he returned to his home in Berkeley. He however left with Mr. Cline, of St. Thomas' Hospital, a supply of the vaccine lymph, and this eminent surgeon soon found an opportunity to insert some of the same into the hip of a boy complaining of hip-disease. It was done under the plea of creating necessary counter-irritation, and perfect vaccine sores resulted therefrom. After fully recovering from the vaccination the boy was inoculated in three places with active smallpox matter without producing any of the symptoms of that dreaded disease. With this marked demonstration Mr. Cline became an active advocate of Jenner's discovery, and there was no longer difficulty in finding either physicians or patients willing to practically test its value.

Indeed, in less than twelve months after the publication of Dr. Jenner's pamphlet, a manifesto fully endorsing the truthfulness and value of his discovery was published, signed by seventy-three of the most eminent members of the medical profession in London. Within the same period of time the practice of cowpox vaccination was introduced into this country by Dr. Benj. Waterhouse, Professor of Physic at Cambridge, Mass., who vaccinated members of his own family; and the practice spread rapidly throughout the United States. Under the judicious leadership of Dr. de Carro, of Vienna, the practice of vac-

cination was rapidly introduced into all the countries of central and southern Europe.

In Spain it was warmly welcomed by both physicians and clergy, by whom a knowledge of it was rapidly communicated to all her colonies on this side of the Atlantic. In Russia the cause of Dr. Jenner found an efficient advocate in the Empress, who introduced the practice of vaccination in her own family, and facilitated its extension to Siberia and the countries of Asia.

Within the short period of two years after the original pamphlet of Dr. Jenner, entitled: "Inquiry into the Cause and Effects of the Variolæ Vaccinæ," London, 1798, it had been translated into nearly every language in Europe. And within six years the practice of vaccination for the prevention of smallpox had been introduced and sanctioned in every civilized and even semi-civilized country on the globe.

Such is a simple narrative of the inception, patient prosecution, and final completion of the great discovery of the true cowpox lymph and its efficacy as a preventive of smallpox by Dr. Edward Jenner. And thus was the result of more than twenty years of thoughtful, skillful, persevering investigations given to the world with the utmost freedom and truthfulness. It was accompanied by no fictitious names, no unexplained processes, and no hint at selfish or pecuniary recompense. On the contrary, he was among the most zealous in extending its benefits to all classes, and especially to the poor. And he apparently looked only for the fulfillment of Lord Bacon's saying: "That it is heaven upon earth, to have a man's mind move in charity, rest in providence, and turn upon the poles of truth." While it is true that Dr. Jenner's discovery was received and adopted both by the medical profession and the masses of the people of all civilized countries with the extraordinary rapidity just described, it was not without the bitter opposition of some persons, and the injurious effects of a few over zealous or injudicious friends.

To correct the errors and misstatements of these and to furnish additional facts of value, Dr. Jenner published a paper entitled: "Further Observations on Variolæ Vaccinæ, London, 1799;" another on "A Continuation of Facts and Observations Relative to the Variolæ Vaccinæ, London, 1800;" and the same year, "A Complete Statement of Facts and Observations Relative to the Cow-Pock;" followed by another "On the Origin of Vaccine Inoculation, London, 1801.' But in no one of these additional publications did he exhibit the ordinary spirit of controversy.

All were characterized by the highest degree of candor and regard for truthfulness, and he continued the practice of his profession in his native town regardless of the most flattering inducements to change his residence to London. In 1788 he had married Miss Catherine Kingscote, a lady admirably qualified to add to his social and domestic happiness. In 1792, wishing to lessen the pressure of his professional practice by changing its direction, he obtained from the University of St. Andrews the degree of Doctor of Physic. However, he not only continued a lucrative practice and actively maintained a social organization of his neighboring practitioners, but he also continued to give so much attention to studies in natural history that he was in 1788, or soon thereafter, elected a member of the Royal Philosophical Society of London. Notwithstanding all these proofs of his love of home, of domestic happiness, of nature in her native garb, and above all, of nature's God, during the few years immediately following the publication of his discovery, he was overwhelmed with correspondence from every quarter, to such an extent that, in his own expressive language, he was forced to become "Vaccine Clerk for the World." In addition to this, congratulatory communications came to him from kings, queens, officers of state and of learned societies, until he soon found himself elected to membership in nearly all the scientific societies in Europe. If we add to all these time-consuming topics, the fact

that he continued to devote a certain amount of time each day to the gratuitous vaccination of the poor at his own home, we shall see that his time for pursuing the paying part of his professional practice was seriously impaired. This did not escape the observation of his neighbors and most intimate friends, who near the close of 1801 presented him as a testimonial, a service of plate, which was designed, in reality, as a prelude to the obtaining of his consent to a petition to Parliament for a suitable grant of money. Such a petition was presented on the 17th of March, 1802, and was referred to a committee of which Admiral Berkeley was chairman. After proper investigation, the committee reported favorably and Parliament voted a grant of $50,000. Four years later, 1806, after the Royal College of Physicians had reported favorably on the continued success of vaccination, Parliament voted an additional grant of $100,000. Five or six years later still, subscriptions were taken up in the East, and those forwarded from the three Presidencies of Bengal, Bombay and Madras, aggregated little more than $35,000.

In 1808 Dr. Jenner was elected a Corresponding Member of the National Institute. Subsequently he was elected Mayor of Berkeley, and in 1813 he was granted the degree of Doctor in Physic by the University of Oxford, by special decree of the Convocation. His otherwise most happy domestic life received its first shade of sadness from the death of his oldest son in 1810, leaving him still one son and one daughter. But the deeper sorrow came Sept. 13, 1815, when Mrs. Jenner, after a protracted sickness, died. From this time Dr. Jenner lived in practical retirement, having made his last visit to London the year previous, when he was presented to the allied sovereigns and many other distinguished persons then assembled in that city. Though in practical retirement during the last eight years of his life, he not only found serene enjoyment in the fields and groves of his native town, but sufficient occupation

also in still gathering facts concerning the results of vaccination particularly as connected with other cutaneous eruptions, and in discharging the duties of physician, naturalist and magistrate.

He published his last paper in 1822, "On the Influence of Artificial Eruptions in Certain Diseases." His last written expression concerning the general subject of vaccination was found on the back of a letter dated Jan. 14, 1823, and is copied by his biographer, Dr. Baron, as follows: "My opinion of vaccination is precisely as it was when I first promulgated the discovery. It is not in the least strengthened by any event that has happened, for it could gain no strength; and it is not in the least weakened, for if the failures you speak of had not happened the truth of my assertions respecting those coincidences which occasioned them, would not have been made out."

Dr. Jenner is reported to have had a mild attack of apoplexy Aug. 6, 1820, from which he quickly recovered. Another and severe attack came suddenly on the morning of Jan. 25, 1823, from which he died the following morning in the 74th year of his age. His body was buried in the chancel of the parish church of Berkeley, Feb. 3, 1823, in the presence of a large concourse of people.

A good picture of him by Sir Thomas Lawrence is given in connection with a biography in Vol. II of the Medical Portrait Gallery by Thomas Joseph Pettigrew, F. R. S., etc. Soon after his death an excellent statue of him by Sievier was placed in the cathedral at Gloucester,[1] and 1858 a more expensive one was erected in London.

In 1808 Dr. Jenner met and formed an acquaintance with Dr. John Baron, then just entering upon the practice of his profession. This acquaintance soon ripened into a most intimate mutual friendship, which continued to the end of their lives. The trustees of Dr. Jenner's estate placed all his papers, manuscripts and correspondence in the hands of Dr. Baron

[1] See London Lancet for 1881, for an account of statue to Jenner.

as the most suitable person for furnishing a full and correct biography of the former. He accepted the task with reluctance on account of the pressure of other engagements, but nevertheless completed it in two volumes, published in 1827, with so much painstaking detail, accuracy and candor as to receive from all the highest degree of commendation. Dr. Baron appears to have appeciated not only the permanent value of every fact connected with the great discovery of Dr. Jenner, but he appreciated also his motives, his attainments and his boundless benevolence, and hence his biography was made so complete, that it has furnished nearly all the facts and materials used by subsequent writers when referring to the subject.

During the last fifty years it has been a very common custom for newspaper, magazine and even medical writers to represent the members of the regular medical profession as so conservative, or wedded to preconceived opinions, that every new discovery was received with reluctance and its author generally persecuted into poverty. But I have searched the pages of medical history from the time medicine began to develop a scientific basis in chemistry and anatomy, in the fifteenth century to the present time, without finding any proof of the correctness of this very popular allegation. On the contrary, every important discovery in chemistry, anatomy, physiology, etiology, pathology or therapeutics that was susceptible of proof by any reliable methods of investigation has been accepted and incorporated into our medical literature in less than ten years after its promulgation, and with due credit to its author.

The spirit of conservatism has at no time been more than sufficient to insure a fair examination of the various bearings of any given proposition; and in recent times often not even sufficient for that. One of the most remarkable items connected with the history of the discovery of cowpox vaccination, was the twenty years of the patient, persevering investigation by Dr. Edward Jenner before he deemed his

proofs sufficient to justify him in announcing it to the world. And the next most noted event was the rapidity with which it was accepted and practically applied by the medical profession in all parts of the world. As has been previously stated, the announcement of Dr. Jenner's discovery called forth from a few physicians and others strenuous opposition; and the same class of peculiarly constituted individuals have been perpetuated until the present time. They are found filling the ranks of the mind-curists, Christian scientists, anti-vaccinationists, anti-vivisectionists and anti-common-senseists of the present day. But they embrace in their ranks very few regularly educated members of the medical profession. In speaking of medical discoveries it may not be amiss to say, we mean the announcement of such new facts or truths as are capable of demonstration by legitimate or scientific methods, as distinguished from the announcement of mere metaphysical theories or exclusive dogmas, of which the eighteenth century was peculiarly prolific. The first have always been accepted and incorporated into the proper department of our permanent medical literature, while the latter have with equal uniformity gained popularity for a time, generally in proportion to the mystery in which they were enveloped, and then given place to their successors. This is well illustrated by comparing the present position of the real discovery of Dr. Jenner with the two most pretentious theories of the same century. For it must be remembered that this is not only the centennial anniversary of the discovery of Jennerian vaccination, but it is equally the centennial anniversary of the announcement of the so-called new or phrenological system of mental philosphy by Dr. Gall in his lectures in Vienna, Austria, 1796, and also of the appearance of an "Essay on a New Principle for Ascertaining the Curative Properties of Drugs," by Dr. Christian Friedrich Hahnemann, of Germany, which was the real initiation of the two so-called, universal and immutable laws that "like cures like," and

"the greater the attenuation or dilution of the drug the greater its curative power." The new mental philosophy of Dr. Gall, though advocated with the eminent ability of Drs. Spurzheim and Andrew Combe, as destined to revolutionize our ideas of mental philosophy as well as the ordinary principles of education, was so plainly founded on hypothetic or imaginary lines as to admit of no proof either anatomic, physiologic or pathologic and consequently it gained only a partial recognition by medical men, and its advocates were soon induced to make their appeals to the non-professional public. And now at the end of the century its peripatetic lecturers and phrenologic fortune-tellers, can hardly attract anywhere a popular audience sufficient for an evening's amusement. So, too, the purely speculative theories of Hahnemann, being capable of proof by no scientific processes or natural laws, gained so few advocates among the members of the profession, that after the first ten years their author abandoned the ordinary channels of medical literature and appealed directly to the non-professional public and proclaimed them as constituting a new and universal system of medicine. The result is, that the system of Hahnemann now on its first centennial anniversary, has neither legal nor general medical recognition in Europe; and in this country of free fadisms, the number who actually adhere to the practical application of its so-called fundamental laws is not equal to the number of those who may still be found in the ranks of the anti-vaccinationists. And yet its nominal advocates still call it the "new school" of medicine, though born full-fledged an hundred years since; and they attribute its non-acceptance by the general medical profession solely to the stolid conservatism of said profession. Such is the origin of the popular fallacy concerning the reluctance of the medical profession to embrace new discoveries, while, in truth, there is no other class of educated people to be found, whose history proves it more ready to receive and appropriate new facts or

real discoveries and to reject mere theoretic dogmas. But my task would be inexcusably defective did I not add to the simple history of the truly great discovery of the protective power of cowpox vaccine virus, some comments on the personal character of the discoverer himself. For, if we may credit the combined testimony of his chosen and most competent biographer, D. John Baron, and his contemporaries, the character of Dr. Edward Jenner is one of the most interesting and remarkable to be found on the records of medical history. Born in a quiet country town, of parentage of intelligent and high moral or religious qualities, and spending his childhood and youth under the same influences in the midst of his native groves and meadows it was natural that he should develop a passionate love of nature and a marked reverence for nature's great Architect. And receiving his general education, not in the higher colleges or universities, but in the more quiet though excellent local schools near his parental home, still further tended to foster that fondness for the study of natural history and, indeed, all the natural sciences in which he became proficient in after life. No other environment or influences could have been better calculated to develop into unusual prominence the three most remarkable traits in the character of Dr. Jenner, namely, his love of nature and all that is truthful and good, his benevolence or unselfish desire to prevent or relieve human suffering, and his patient and persevering pursuit of whatever promised to result in material benefit to mankind. The last-named element of his character has been amply illustrated by what has already been said of his more than twenty years of earnest pursuit of a reliable preventive of smallpox, regardless of the indifference of his professional brethren generally, and of the positive jeers of some of those most nearly in association with him. His love of nature and genuine reverence for the author of all good is admirably illustrated in a letter to a friend written when the evidences of the genuineness of his

discovery were nearing completion. He says: "While the vaccine discovery was progressive, the joy I felt at the prospect before me of being the instrument destined to take away from the world one of its greatest calamities, blended with the fond hope of enjoying independence and domestic peace and happiness, was often so excessive, that in pursuing my favorite subject among the meadows, I have sometimes found myself in a kind of revery. It is pleasant to me to recollect that these reflections always ended in devout acknowledgements to that Being from whom this and all other mercies flow."

But the most vivid illustration of Dr. Edward Jenner's unselfish nature and of his noble conceptions of the true objects of human life is found in his answer to the most tempting inducements to leave his native town and enter upon a professional contest for wealth and fame in the great city of London. We are assured by his biographers that after the full demonstration of the truth of Dr. Jenner's discovery by Mr. Cline, the latter urged him to settle in London, promising him £10,000 ($50,000) per annum as the result of his practice.

To this, however, his deliberate reply was: "Shall I, who even in the morning of my days sought the lowly and sequestered paths of life, the valley and not the mountain; shall I, now my evening is fast approaching, hold myself up as an object for fortune and fame? Admitting it as a certainty that I obtain both, what stock should I add to my little fund of happiness? My fortune, with what flows in from my profession, is sufficient to gratify my wishes; indeed so limited is my ambition, and that of my nearest connections, that were I precluded from future practice I should be enabled to obtain all I want. And as for fame, what is it? A gilded butt, forever pierced with the arrows of malignancy."[2]

Did the combined temptations of offered wealth and fame ever receive a more fitting reply? And has there ever been penned a more stinging rebuke to

the manifest commercial, money-making, fame-seeking spirit pervading the ranks of the profession of the present day. To have an intelligent appreciation of the beauties, the harmonies and the beneficence of nature, with genuine reverence for nature's great Architect; to labor diligently for the prevention and relief of human suffering, and the elevation of the race; and at the same time to be content with a competence sufficient to supply all our real wants, is not only a true exemplification of the letter and spirit of our national code of medical ethics, but it is equally an exemplification of the only sure road to human happiness here or hereafter. Such was preëminently the life and character of Dr. Edward Jenner, one of the noblest benefactors of the human race.

For an account of the present status of vaccination in our country, and the chief obstacles in the way of realizing all the benefits its faithful and universal application would confer, I refer you to the members of the various parts of this widely extended country who are expected to take part in the discussion which is to follow.

However, as the shades of sixty years of professional toil and 80 years of life are already upon me, and I may never again have an opportunity to address you even by proxy, I must be allowed to remind you that I deem this to be the true semi-centennial of this great national Association; and to congratulate you on the substantial accomplishment of the leading object which prompted its formation, namely, the placing of our system of medical education on a broader, more systematic and more efficient basis. I am filled with contentment and thankfulness that I have been permitted to live until this day. And I sincerely thank you for so patiently listening to this address.