Medical History

Erasmus Darwin, Physician and Poet

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In the mid-eighteenth century it was just possible for an educated and eager mind to comprehend the whole of existing scientific knowledge. Such an intellect was that of Erasmus Darwin, who was born 240 years ago on 12 December 1731. He became not only a successful physician and much admired poet but also a pioneer of the theory of evolution and inventor of various mechanical contrivances. But he is now little remembered owing to the passage of time, a contemporary parody of his verse, the greater eminence of his grandson Charles Darwin, and his own lack of ambition and indifference to fame.

Erasmus Darwin was the fourth son of Robert Darwin, a retired barrister, of Elston Hall in Nottinghamshire. As a boy he was interested in mechanical things and poetry but disliked exercise and rural pursuits. He spent nine years at

Erasmus Darwin, 1731-1802. (Reproduced by kind permission of the National Portrait Gallery, London.)

Chesterfield School, where "he felt a degree of respect, gratitude and affection for his masters, unusual in a schoolboy." Proceeding to St. John's College, Cambridge, he read classics, mathematics, and medicine, and then went for one term to attend William Hunter's anatomy lectures in London. In 1754 he arrived at Edinburgh to complete his medical education, where he made his mark among his fellow students. Most of his teachers there were strict adherents of the now

obsolescent views of Boerhaave. After taking the Cambridge M.B. in 1754 Darwin attempted to practise in Nottingham but moved to Lichfield in 1756 where some fortunate cures established him for the next 25 years.

He kept accounts of his practice for the first 16 years, which showed takings of £192 10s. 6d. in the first year, rising annually until in 1771 he topped £1,000. Charles Darwin expressed surprise that this income was not higher, but it would be equivalent to about £10,000 a year now and was quite adequate for his needs.

Erasmus Darwin was a large man with a face pitted by smallpox, a clumsy gait, and a pronounced stammer which did not prevent him from becoming a witty and sometimes sarcastic conversationalist. Some youthful excesses and an attack of gout decided him to become an abstainer, a view in which he was fortified by observing the ill effects of drink on his patients. He had a hearty appetite, however, and became obese in later life, but his somewhat forbidding appearance was softened by a pleasant smile and a sympathetic and generous nature.

Darwin's reputation as a doctor eventually spread far beyond Lichfield, as shown by two incidents; the first when a gentleman in the last stages of consumption sought his advice and asked how long he could live, to which Darwin replied, "perhaps a fortnight, but as you come from London why did you not consult the celebrated Physician Dr. Warren?" "Alas, doctor," the patient replied, "I am Dr. Warren."* Warren was one of the physicians to George III who had been consulted in the King's mental breakdowns, attributed to porphyria by recent research. The second incident relates to a Lady of the Court whose successful treatment by Darwin reached the ears of the sovereign, who said: "Why does not Dr. Darwin come to London? He shall be my physician if he comes."

Personal Life

But Darwin preferred to stay at Lichfield, where in 1757 he had married Mary Howard aged 17. She bore him five children, two dying in infancy. Of the three surviving sons the eldest, Charles, became a medical student but died from septicaemia after dissecting the brain of a child. The second son, a retiring character, became a solicitor and drowned himself in the River Derwent at the end of his garden—a great shock to his father, who did not understand this quiet son. The third son, Robert, became a physician in Shrewsbury and the father of Charles Darwin. Mrs. Darwin died in 1770 after a long illness.

The family were friendly with Miss Anna Seward, an author and poetess known as the Swan of Lichfield, who wrote an unsympathetic biography of Darwin in 1804. It was suggested that she had hoped to marry the widower, but

*According to Munk's Roll, vol. 2, Dr. Warren died of erysipelas of the head.

instead he fathered two illegitimate children, the misses Parker, who were brought up openly in the family home and later opened a girl's school at Ashbourne, Derbyshire. They were helped in this task by Darwin's publication *A Plan for the Conduct of Female Education in Boarding Schools*.

In 1778 Darwin made an 8-acre botanic garden, and in 1781 he married a widow to whom he had addressed passionate verses even before the death of her much older husband. At her instigation they moved to Derby, where his practice flourished and where four sons and three daughters were born. One daughter was to be the mother of Francis Galton the geneticist.

Samuel Johnson had left Lichfield in 1737, though it is known that on occasional visits he and Darwin met. They were, however, incompatible. Both were large characters accustomed to be listened to and Darwin's stammer put him at a disadvantage; Johnson was a pious Christian, while Darwin was thought (wrongly) to be an atheist. Perhaps a more important factor was their disparity in age, Johnson being 22 years the elder.

Published Writings

As a poet Darwin is best known for *The Botanic Garden*, published in two parts, *The Economy of Vegetation*, and *The Loves of the Plants*. Far more than vegetation is described in the former, which epitomizes all scientific knowledge in rhyming couplets. Ample footnotes explain the argument of the poem, forming almost a textbook of cosmology, geology, and natural history in themselves. Horace Walpole considered Darwin's description of the origin of the cosmos as "one of most sublime in any author." It reads as follows:

Let there be Light! proclaimed the Almighty Lord
Astonished Chaos heard the potent word
Through all his realms the kindling ether runs
And the mass starts into a million suns;
Earths round each sun with quick explosions burst
And second planets issue from the first;
Bend as they journey with projectile force,
In bright ellipses their reluctant course;
Orbs wheel in orbs, round centres centres roll
And form self balanced one revolving whole—
Onward they move amid their bright abode
Space without bound, the bosom of their God.

Some of Darwin's other lines were remarkably prophetic as in:

Soon shall thy arm, unconquered steam! afar
Drag the slow barge, or drive the rapid car;
Or on wide waving wings expanded bear
The flying-chariot through the field of air.

In a footnote Darwin adds, "There seems no probable means of flying by the power of steam or some other explosive material." He foretold submarines:

Led by the Sage, Lo! Britain's sons shall guide
Huge Sea-Balloons beneath the tossing tide
The diving castles, roofd with spheric glass
Ribbd with strong oak and barrd with bolts of brass
Buoyed with pure air shall endless tracks pursue.

The footnote states "in another half-century it may be safer to travel under the ocean than over it."

The *Loves of the Plants* was an attempt to illustrate in verse the recent botanical classification of Linnaeus based on the sexual differences of flowers, but a clever parody *The Loves of the Triangles* by Canning and two friends rather deflated it. Darwin took this philosophically as he had no doubt enjoyed composing the poem and admitted to being well rewarded by the publisher. Over 100 years later the *Cambridge History of English Literature* reviewed his poems with little sympathy almost amounting to contempt.

Zoonomia, or the Laws of Organic Life, was his most important prose work and was in essence a textbook of physiology and medicine. Diseases were forced into a pseudo-Linnaean classification comprising diseases of irritation, sensation, volition, and association, with further subdivisions into orders, genera, and species. There are descriptions of well-observed clinical syndromes, but Darwin was, of course, limited by contemporary accepted treatment, of which bleeding, purging, and leeches were the mainstay. In the section "Of Generation" he refers to the changes produced by breeders in domestic animals which become inherited, and writes "the resemblances of different warm animals suggests that they have been produced from a similar living filament. He elaborates further in his poem *The Temple of Nature*.

Organic Life beneath the shoreless waves
Was born and nursed in Oceans pearly caves
First forms minute, unseen by spheric glass
Move on the mud and pierce the watery mass;
These, as successive generations bloom
New powers acquire and larger limbs assume
Whence countless groups of vegetation spring,
And breathing realms of fin and feet and wing.

In a valuable recent assessment King-Hele suggests that Erasmus's views on evolution came nearer to the modern theory than those of his grandson Charles. But they were unsupported by the mass of evidence accumulated by the latter.

Other Interests

Erasmus kept up his interest in medicine throughout his life, as is shown by a letter to his son Robert in 1792 in which he wrote: "I think you and I should sometimes exchange a long medical letter especially when uncommon cases occur."

With others, Erasmus founded the Lunar Society of local scientists, so called because they dined at full moons to aid the journey home, but they were content to be called "lunatics." Among distinguished members were Keir and Joseph Priestley, chemists; Thomas Day, an eccentric and author of *Sandford and Merton*; F. Y. Edgeworth, an inventor and the father of Maria; James Watt and Mathew Boulton the eminent engineers; Samuel Galton and Dr. William Withering, of digitalis fame. Josiah Wedgwood the potter was a frequent guest. Seven of them, including Erasmus Darwin, were Fellows of the Royal Society.

On world events Darwin's views were liberal. He approved of the French Revolution and the revolt of the American colonies and he wrote against slavery and advocated humane treatment of the insane. His mind was always busy with mechanical inventions, which included such diverse objects as a horizontal windmill, a knitting loom, canal locks, carriage wheels with springs in the spokes, improved water closets, a speaking machine which actually worked, and a wind vane carried through the roof of his house to register on his desk.

Conclusion

Let Charles Darwin have the final word when he wrote, "of all his characteristics the incessant activity or energy of his mind was perhaps the most remarkable, added to a vivid imagination. Considering his indomitable energy he suffered much from a sense of fatigue which he said he inherited from his father." Charles Darwin himself was also to inherit this predisposition.

On 18 April 1802 Dr. Darwin rose as usual at 6 a.m. and began a long letter to his old friend Edgeworth, describing his new garden at Breadsall Priory. At 7 a.m. he was seized with a violent shivering fit and went into the kitchen to warm

himself, but still feeling faint and cold returned to his arm-chair, "where without pain or emotion of any kind he expired a little before 9 o'clock."

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Any Questions?

We publish below a selection of questions and answers of general interest

Inheritance of Muscular Dystrophy

What is the risk of muscular dystrophy affecting the children of a woman whose father had the disease? Her two-year-old son is apparently healthy.

There are several different genetically determined types of muscular dystrophy.¹ To answer this query therefore it would be necessary to determine both the clinical type of muscular dystrophy and to collect a detailed family tree. This would be a suitable family to refer to the nearest genetic clinic.

¹ Emery, A. E. H., and Walton, J. N., in *Progress in Medical Genetics*, Vol. V, ed. H. G. Steinberg and A. Bearn. London, Heinemann, 1967.

Isoniazid and Resistant Tubercle

Is isoniazid of any value as part of combined therapy in cases in which the tubercle bacilli are insensitive to the drug?

Tests of resistance concern populations of bacilli. They do not give an estimate of the sensitivity of individual bacilli. A resistant result by any method does not necessarily indicate that all the bacilli are insensitive. It is because of this that some doctors advocate using isoniazid in re-treatment regimens. It is argued that even if the drug is affecting only 5% of the bacilli—the other 95% being insensitive—this is a worthwhile contribution. However, the only controlled trial that has been done to test this hypothesis¹ failed to support it.

Whether it is included in re-treatment regimens depends on whether the physician bases his treatment on a *a priori* argument or on controlled clinical trials.

¹ International Union against Tuberculosis. *Bulletin of the International Union Against Tuberculosis*, 1969, 42, 7.

Maximum Dose of Isoniazid

Is it ever necessary to give more than 300 mg of isoniazid daily even in rapid inactivators?

With the "standard" triple-drug regimen of daily streptomycin, PAS and isoniazid used in this country there is no need to give more than 300 mg isoniazid daily. Rapid inactivators of isoniazid will respond just as well as slow activators. Indeed, the speed of inactivation has little effect on the efficacy of any daily regimen. It is only with a once-weekly regimen of streptomycin and isoniazid that inactivation rate has been

shown to have an important influence.¹ If isoniazid is given alone in the early stages of treatment, which should very seldom be necessary even in poor countries, the dose should be higher than 300 mg.²

¹ Tuberculosis Chemotherapy Centre, Madras. *Bulletin of the World Health Organization*, 1970, 43, 143.

² Gangadharam, P. R. J., Devadatta, S., Fox, W., Nair, C. N., and Selkon, J. B., *Bulletin of the World Health Organization*, 1961, 25, 793.

Notes and Comments

Loss of Libido in Depression.—Dr. C. A. FOX (London S.E.7) and Drs. A. A. A. ISMAIL and J. A. LORAIN (Edinburgh) write: May we add a comment to your admirable answer to the question on loss of libido in depression ("Any Questions?" 16 October, p. 166)? It has been noted^{1,2} that there is a nyctohemeral (diurnal) change in plasma testosterone levels, with higher readings, generally, in the morning and lower levels in the evening. We have confirmed this, and have, in addition, found a marked day to day variation in plasma levels.³ We would suggest that any studies on androgenic function should take these variations into account by the collection of samples twice daily for four or five consecutive days, from any individual.

Dr. F. KRÄUPL TAYLOR (London N.W.3) writes: With reference to the answer to this question I should like to add that in my experience such loss of libido and absence of ejaculation may be due to amitriptyline medication. In that case it is sometimes helpful to prescribe ½-1 tablet of prostigmin 15 mg about half an hour before attempting intercourse. Both libido and ejaculation may be restored in this way.

OUR EXPERT replies: I agree with Dr. Fox and Dr. Kräupl Taylor about the nyctohemeral change in plasma testosterone levels but I do not think there is any difficulty in distinguishing between the levels in androgenic-deficient men and those whose testicles are producing normal amounts of male hormone. Certainly our experience has shown no discrepancies between the plasma testosterone and physical findings.

The suggestion that prostigmin may be helpful is certainly interesting but I have no personal experience regarding its efficacy.

¹ Resko, J., Eik-Nes, K. B., *Journal of Clinical Endocrinology and Metabolism*, 1966, 26, 573.

² Nieschlag, E., and Ismail, A. A. A., *Journal of Endocrinology*, 1970, 46, 3.

³ Fox, C. A., Ismail, A. A. A., Love, D. N., Kirkham, K. E., and Loraine, J. A., *Journal of Endocrinology*, in press.