

CHAPTER II

A GROWING COMMITMENT TO SCIENCE

1. Active Service in the Crimean War

Between 1851 and 1854, Fox had proven himself to be a competent technician and, moreover, had made something of a name as a forward-looking proponent of the use of modern technology in warfare. His manual was being used to train the first troops issued the new service rifle, and his lectures at Hythe had set the pattern for further instruction at the school. Finally, his early arms collection had shown how the subject could be best illustrated and communicated to the troops. As a result, his future was relatively certain, particularly now that the army had decided to unilaterally phase out the older service musket in favour of the new rifle, by now the government's own Enfield. The impending war in Russia merely helped speed the process along.

The first indications of a war in the East had come in the summer of 1853, when Russian imperial ambitions in the Black Sea had become manifest. As a show of strength, the British army staged a series of maneuvers at Cobham in Surrey, really the first of their type, toward the end of the summer. The show proved ineffective, however, and by autumn war still looked imminent. With the destruction of the Turkish fleet at Sinai in late November, there was little doubt that Britain would be drawn into the conflict. Following a sporadic series of diplomatic exchanges, a state of war was finally declared in April, 1854¹.

In anticipation of that event, British troops had begun embarking for the Mediterranean in February. On the 22nd, following a public review by Prince Albert, Lord Hardinge and the Duke of Cambridge, Fox's battalion was given an enthusiastic send-off by the crowds lining the streets as they marched from St. George's Barracks to Waterloo Station and the Southampton train. From Southampton the battalion sailed directly to Malta (essentially a staging area for the as yet to be declared Eastern Theatre) on the ships Ripon, Orinoco and Manila, arriving there on 5 March. Among the Ripon's passengers was W.H. Russell, the Times correspondent, a figure with whom Fox was to become acquainted during the campaign². Fox himself was still assigned 'to particular service', and since he was not

¹ For background I have depended on Alexander William Kinglake, The Invasion of the Crimea, 6 vols. (London: Harper and Brothers, 1888). Edward Hamley, The War in the Crimea, 3rd ed. (New York: Charles Scribner's Sons, 1891); Henry Tyrrell, The History of the War with Russia, 3 vols (London: London Printing and Publishing, n.d.); A.J. Barker, The War Against Russia, 1854-56 (New York: Holt, Rinehart and Winston, 1971); Philip Warner, The Crimean War: A Reappraisal (London: Arthur Barker, 1972); R.L.U. French Blake, The Crimean War (Hamden, Conn: Archon Books, 1972).

² William Howard Russell, The War, From the Landing at Gallapoli to the Death of Lord Raglan, 2nd ed. (London: George Routledge, 1856); also William Howard Russell, Russell's Despatches from the Crimea, 1854-56, ed. Nicolas Bentley (New York: Hill and Wang, 1966), p. 24.

listed among the officers travelling on either ship, it appears that he was already in Malta to provide for the arrival of his own and other battalions³.

Fox was charged in Malta with establishing a field school for musketry training along the lines of that at Hythe, and, in fact, organized under the Hythe School's authority. Also involved in the work were Captain A.E. Rowley, of the Grenadiers, Captain Charles Barring of the Coldstreams and Captain D.F. Buckley of the Scots Fusilier Guards, all of whom had had some experience with the new rifle⁴. Sites were selected in the dunes at St. George's and St. Julian's Bay, Sliena, and Fort Tigue, and the troops, as soon as they arrived, were assigned to regular musketry practice. Russell took a great interest in the training methods, reporting them in dispatches to his paper. Fox was mentioned as well in the Morning Chronicle, as Lady Stanley—her enthusiasm for once outreaching her low opinion of her son-in-law—announced with obvious pride⁵.

With the British declaration of war in April, the training camp was temporarily suspended as troops began embarkation for the East. Fox travelled with his battalion on the Golden Fleece on 22 April, arriving a week later at Scutari on the northwest coast of Turkey. Technically, at the time Fox was without an assignment. But rather than rejoining the Guards, he accepted a position just prior to leaving Malta as Assistant Quartermaster in Major General Sir De Lacy Evans' Second Division, one of five infantry divisions organized for the war. Lieutenant Colonel J.S. Brownrigg, with whom Fox had worked four years before in the first Minié tests, was also on Evans' staff and probably had a part in Fox's selection for the post. He first joined his division in Turkey, near the beginning of May⁶.

In June, in response to Turkish pressure to join the offensive on the western Danube, British troops were shifted to Varna on the northwest coast of the Black Sea in present-day Bulgaria. The Second Division, including Fox, arrived on 19 June, just a few days after Fox's own regiment⁷. The Russians, in the meantime, had been repulsed by the Turks, so there was little for the British troops to do and the campaign slowed down to a waiting game. In July, while the Turkish army continued to engage the enemy to the north and east, the British forces, and soon after their French allies, suffered through a cholera epidemic which left several thousand dead. In one ten-day period alone, the Light Division lost eighty men. Fox fortunately managed to escape the disease, filling in for his immediate supervisor, Lieutenant Colonel Percy Herbert, the Division's Quartermaster General, during the latter's illness⁸.

³ Hamilton, III, 160-63.

⁴ Hamilton, III, 164 and 488; Hart's Army List, 1856.

⁵ Lady Henrietta Maria Stanley, Letter to Lady Maria Josepha, 12 Apr 1854. Russell, The War, pp. 4-9; Mitford, Stanleys, p. 92. Also on Malta see PRP, WO, 17/2160-64, 62/4, PI, and 33/8, P721.

⁶ J.S. Brownrigg, Letter to Lord and Lady Stanley, 26 Jun 1855, Mitford, Stanleys, pp. 138-9; Hamilton, III, 181; Russell, The War, p. 18; Russell, Despatches, p. 27.

⁷ Hamley, p. 28; Russell, Despatches, p. 56.

⁸ Lord Edward Stanley, Letter to Lady Henrietta Maria, 10 Oct 1854, in Mitford, Stanleys, p. 106. SSW, PRP, A 1 (a).

Partially in an attempt to break the spell, a decision was made toward the end of the summer to institute a more active campaign. As a result, in early September the entire Allied army, or some 60,000 men, were loaded onto 29 steamships and 56 sailing ships and transferred en masse to the new front on the western shore of the Black Sea peninsula of Crim Tartary. Fox travelled on the City of London along with the rest of De Lacy Evans' staff. Russell accompanied them and in fact remained informally attached to the Second Division over the course of the next four weeks. His account, therefore, provides a fairly accurate picture of Fox's own experiences at the time⁹.

The first troops arrived at Old Fort, the landing site, about 30 miles north of Sevastopol, on 14 September. The first Russian defensive positions were established on the highlands south of the Alma River, the principal physical barrier between the Allied forces and Sevastopol. The main threat to the Russians was from Allied sea bombardment, but otherwise their position was relatively secure. The weak point, however, was on the inland side, where the river narrowed and the steepness of the banks was reduced. It was there, as a result, that most of the Russian forces were concentrated. Understandably, too, it was there that the Allies began their own assault, led by the British columns on the east.

The Battle of the Alma Heights was to be Fox's only combat experience, and it is, therefore, of some interest here¹⁰. It was also of interest as an indication of his views on the new rifle. As a staff officer his main duties were administrative, consisting mostly of carrying messages from Division to Headquarters and back again. Like other officers performing similar duties he was exposed to Russian snipers, a danger aggravated by the fact that officers were expected to eschew cover in order to encourage the men by their example. Due to his staff position he was also well placed to view the battle at close hand; Raglan's command post was established, in fact, beyond enemy lines and Fox, along with other messengers, was forced to ride to and fro in full view of the enemy positions.

The British advance was led by the Light Division on the far left flank, and by the Second on the right of the British line. Ahead lay an expanse of relatively open land followed by a bank littered by vineyards and low stone walls. Then came the 'tortuous little stream', as Russell described it¹¹, and the steep, and therefore, less exposed southern banks. The Russians were positioned at two levels: at the First or Lesser Redoubt, located about three-quarters of the way up the hill; and at the Second or during the assault.

After beginning their advance the British troops were ordered to halt about a mile from the river to allow the French troops to make their own advance on the west. Already under considerable fire, the troops were forced to lie down in position, and for an hour and a half they were shelled by the Russian artillery. Their scarlet uniforms only helped

⁹ Russell, The War, pp. 153-185; Despatches, pp. 72-89.

¹⁰ In addition to Russell, the following account is based primarily on Peter Gibbs, The Battle of Alma (Phila. J.B. Lippincott, 1963); and John Selby, The Thin Red Line (London: Hamish Hamilton, 1970).

¹¹ Russell, The War, p. 177.

to direct the enemy fire as Russell observed¹². Finally, in the late afternoon Raglan gave the order to resume. Already, however, the troops were decimated and the orderly line was soon further disrupted as troops passed through the vineyards. The Light Division made the quickest progress, crossing the Alma and reassembling beneath its steep banks for the final assault. The Second Division, in the meantime, had been held up at the burning ruins of Bourliouk village. Pennefather's brigade, together with De Lacy Evans and his staff—Fox among them—passed to the left of the village and were stopped at the bridge. At the far left a number of men from Pennefather's brigade managed to join Yea and Codrington of the Light Division in their final assault on the redoubts. Final support came from the Guards Division, including Fox's old battalion, which served as the Light Division's reinforcement.

Russell, who was still with Evans' staff, had managed to work himself up from the village to witness the Guards' final assault:

The distance between the two was rapidly diminished when suddenly the whole Brigade [of Guards] poured in on their dense masses a fire so destructive that it annihilated the whole of the front rank in an instant, and left a ridge of killed and wounded on the ground¹³.

Fox's account was no less concise:

I saw the Grenadiers advancing in the most perfect line you ever saw in Hyde Park. They pushed on together with the Coldstream and Fusiliers, without firing a shot, right under the tremendous Battery of heavy pieces. The Grenadiers remained firm throughout. They took the redoubt Battery, capturing one gun¹⁴.

By five o'clock the battle was over and the Russians were retreating 'with all possible speed' towards Sevastopol¹⁵.

In the aftermath of the battle the strengths and weaknesses of both sides became apparent. The officer corps, while distinguished by individual acts of bravery and resourcefulness, had demonstrated the institutional ineptitude which was to become the hallmark of the war, particularly from the British public's point of view. Communications between field outposts had broken down periodically. Provisions for supplies and medical assistance had proved disastrously inadequate, as Fox, an Assistant Quartermaster General, must have been aware. Despite, then, the initial exhilaration of victory, most of those involved

¹² Russell, Despatches, p. 78.

¹³ Russell, Despatches, p. 86.

¹⁴ Fox, Letter to his wife?, September 1854, in the possession of Anthony Pitt-Rivers, Hinton St. Mary Dorset; Thompson, General Pitt-Rivers, pp. 134-35.

¹⁵ Russell, Despatches, p. 88.

admitted that the battle had been a virtual 'hotch-podge of mess and muddle and mismanagement'¹⁶.

On the other hand, the innovations in the technology of warfare had proven their value, something which must have had particular significance for Fox. Total Allied losses, most of which resulted from Russian artillery fire, were a little over 4,000. Fox commented on the horror of the scene: 'I found one spot, where every man in the ranks must have been killed, three files, apparently by the same ball, lying side by side in the order they stood in the ranks'¹⁷. But it was clearly the new rifle that proved the more destructive. While at least a few of the Russian troops had been issued the Miniés, most were still equipped with the older smooth-bore muskets. With their barrels of polished iron and straps of brass, it was, as Russell reflected, 'a good weapon to look at, but...rather a bad one to use'¹⁸. In contrast, the French had nearly all received the new rifle; British troops had been issued them at a rate of 25 per company. Their effectiveness was due 'not only... to their greater range and more effective aim', as Edward Hamley, another witness to the battle, explained, 'but because the bullets were propelled with a force capable of sending them through more than one man's body'¹⁹. In the end, Russian losses were estimated at well 20 over 6,000. The new rifle, later dubbed the 'king of weapons' by Russell²⁰, had clearly shown itself to be the real hero of the battle. For Fox it was clearly a vindication of his work of the last three years.

2. Further Work at Malta

Fox was fortunate in having escaped injury during the battle. Five others on Evans' staff had been wounded, including Evans himself. Fox was mentioned in Raglan's dispatches along with several other officers in Evans' list of those 'singled out for their conduct during battle'. Later that year he was promoted to brevet major expressly for his distinguished service in the field²¹. Of course as a staff officer, as Thompson has pointed out, he would have had a relative advantage in that regard, being in constant contact with those in a position to commend him²². Nonetheless, there is little doubt that he performed his role with his usual efficiency.

Fox remained in the Crimea for only a few days after the Alma. Although he was not wounded, the exertions of the campaign had finally taken their toll and on 15 October, or just before the siege of Sevastopol, Fox was declared unfit for this service by a medical

¹⁶ Helen Morris, 'Chaos in the Crimea', Army Quarterly, 37 (1909), 333-43.

¹⁷ Fox, Letter to his wife?, Sept 1854.

¹⁸ Russell, Despatches, p. 90

¹⁹ Hamley, p. 146.

²⁰ Roads, p. 40. A conclusion supported by more recent scholarship. See Barker, pp. 88-89; Gibbs, pp. 69-70; Warner, pp. 25-34.

²¹ London Gazette, 28 Sept 1854; *ibid.*, 12 Dec 1854. His Crimea medal had clasps for the Alma and Sevastopol. He also received the Turkish medal and the Turkish Order of Medjidio, 5th Class. St. George Gray, 'General Pitt-Rivers', p. x; Hart's Army List, 1862, p. 179.

²² Thompson, General Pitt-Rivers, p. 25.

examiner²³. He left shortly after, arriving in London along with other wounded about three weeks later.

Throughout that period those at home had received little word from him. As of early September, Alice still had plans of joining her husband, a circumstance which would not have been entirely out of the ordinary as the presence of many other officers' wives on the campaign attested. As it was, she was either forced to stay at home, where she was not entirely welcome, or visit her mother-in-law, then staying at Brighton. The first word of Fox came only in early October, when the news of his having survived the Alma arrived. His sudden return to England must have been a surprise, therefore. On 9 November, Johnny Stanley wrote to his mother: 'I suppose you heard Fox was home, I saw him yesterday. I hardly knew him, he is quite sallow and had a beard—he looks rather seedy'²⁴.

For several months Fox remained at his mother's home, then located at Chesham Place. Alice joined him, probably with some reluctance, given her often-strained relationship with her mother-in-law. The couple remained there until the spring, while Fox convalesced. In the meantime he awaited a new assignment.

In March 1855, Fox was ordered to resume his duties as a musketry instructor and was sent back to Malta²⁵. Alice followed him shortly afterwards. Fox was charged in Malta with reinstating the field training school, that time along more ambitious lines. By that date the Army had finally settled on the Enfield in preference to the Minié, and troops were beginning to be equipped with that improved weapon as well. Further tests were also carried out on the Lancaster, the results of which Fox was later to defend in his paper 'The Improvement of the Rifle as a Weapon for General Use' (1858). His methods were again thorough and meticulous, and in fact his superior, Colonel Hay, of the Hythe School, criticised Fox's system in the School's third annual report as simply too time-consuming to allow for the training of the great number of men required for the war²⁶. (Hay and Fox appear to have had a personal feud from the beginning.) Fox's colleagues evidently valued his abilities, however, and Johnny Stanley later reported to his family the high opinion that both men and officers had of Fox at the time—suggesting in turn that the family had underrated him²⁷. In May 1857, near the end of his Malta assignment, he was promoted to lieutenant-colonel, in recognition of his services there²⁸.

²³ Hart's Army List, 1874; SSW, PRP, App. 2, 36.

²⁴ Lord Edward Stanley, Letter to Lady Henrietta Maria Stanley, 6 Sept 1854, Mitford, Stanleys, p. 101. Lady Maria Josepha Stanley to Lady Henrietta Maria Stanley, 9 Oct 1854, Mitford, Stanleys, p. 105. Johnny Stanley, Letter to Lady Henrietta Maria Stanley, 9 Nov 1854, Mitford, Stanleys, p. 109.

²⁵ Mitford, Stanleys, p. 138.

²⁶ Annual Report on the Instruction and Experiments which were carried on at the School of Musketry, for the year ending 31 Mar 1857, p. 20; SSW, PRP, AI (b).

²⁷ Johnny Stanley, Letter to Lady Henrietta Maria Stanley, 30 Jan 1861, Mitford, Stanleys, p. 307.

²⁸ Hamilton, III, 488.

In all, Fox and his wife spent two years in Malta. Two children were born while they were there: Alexander Edward in 1855 and St. George William the following year. The original choice for the first son's name was Alexander St, George. 'Alexander wished by Colonel Gordon [Fox's superior] and Aug,' Lady Stanley quipped, 'St. George is after the new ranges at Malta which were finished at the time of his birth but at which Fox has not yet practised', adding 'when she [Alice] said something about it before I thought it was a joke'²⁹. The family was no less flippant about the second child. As Alice's mother observed: 'Two babies in a nursery under a year old is really too much happiness for the most ardent baby fancier'. By August 1857, the whole family was back in England. 'The children look lean and pale', Lady Stanley remarked to her husband, 'but I daresay they will soon pick up when they get to Alderley'³⁰.

Fox's stay at Alderley was not as relaxed as might have been expected. The criticism of his work at Malta, published in the Hythe School's report, had been taken seriously both by Fox and his superiors. Despite his promotion, then, Fox was clearly in an awkward position. First of all, the criticism of his work made it improbable that he would ever be assigned to another musketry school or branch school. Moreover, as a lieutenant-colonel he could no longer accept the position of instructor, for which the specified grade level was captain³¹. His only choice was to return to his regiment, something he clearly did not want to do.

Lord Stanley had little sympathy for his son-in-law's position and wrote to his wife:

Fox seems of a discontented and querulous nature and expects some high post will immediately be offered to him and if not he is very ill used. I cannot see why he should not go back to his duty in the Regt., like many other officers who have higher staff offices than he has had and who do not consider it a hardship to do Regimental duty.

A month later he asked: 'What does the discontented Field Marshal intend to do with himself,' complaining as well that there would be no game left at Alderley if his son-in-law kept up his shooting habits³².

But by that time it appears that Fox no longer had any choice. Hay's criticism of the Malta school, first hinted at in the spring, was published during the summer, and Fox was obviously placed under the shadow of censure. Also, in attempting to vindicate his work

²⁹ Lady Henrietta Maria Stanley, Letter to Lady Maria Josepha Stanley, 13 Nov 1855. Mitford, Stanleys, p. 150.

³⁰ Lady Henrietta Maria Stanley, Letter to Lady Maria Josepha Stanley, 24 Sept 1856, Mitford, Stanleys, p. 161; Lady Henrietta Maria Stanley, Letter to Lady Maria Josepha, 5 Aug 1857, Mitford, Stanleys, p. 177.

³¹ Hart's Army List, 1856.

³² Lord Edward Stanley, Letters to Lady Henrietta Maria Stanley 21 Aug 1857, and 2 Sept 1857, Mitford, Stanleys, pp. 171 and 180.

Fox had either intentionally or otherwise, instigated an inquiry³³. His efforts, in turn, were interpreted, particularly by Hay, as an act of insubordination (the Malta School was still technically under the authority of that at Hythe), and the possibility of a full Court Martial was not entirely discounted. In the meantime, Fox simply had to accept what was available to him in the way of military duty and await the outcome of the investigation. In the end it would be over three years later before anything was decided.

3. The United Services Institution

One of the first things Fox did upon his return from Malta was to acquire a home. After a lengthy stay at Alderley during the late summer and autumn of 1857, Fox and his family had moved into the Stanley's Dover Street house. Relations again had been difficult and were made even more so by the fact that Alice was pregnant again. As her father complained: 'If Alice's house is much longer delayed, she will pup in the street'³⁴. The third child, named William Augustus after Fox's father, was born in January 1858, in apartments at Brompton Crescent³⁵. But by early spring the house which was being prepared for them, at Park Hill off the Clapham Hill Road, was ready, and the child was christened at nearby St. James 's Church³⁶. It was a comfortable and prosperous neighbourhood, but obviously a step down from the couple's accustomed residences at Dover Street and Chesham Place. The family, expanded over the next three years through the births of two more children, would remain there until 1862, when Fox, the issue over his training methods having finally been resolved, accepted a post in Ireland.

It was during that uncertain period in Fox's life, or the years after his return from Malta and his move to Ireland nearly four years later, that Fox began to regularly attend the meetings of the United Service Institution, located at Whitehall Yard, just across from Admiralty House³⁷. Fox, by virtue of his commission, would have been granted at least a titular membership, and the Institution's Museum was open to any serviceman in uniform. Attendance at meetings and the Institution's lecture series, however, required the payment of an annual membership fee of some 10 shillings; a subscription to the Institution's journal, instituted only in 1858, was included in the price³⁸. Fox, according to

³³ The annual report for the year ending 31 Mar 1857 was officially printed only in early August (Annual Report...of the School of Musketry 1857). The report is dated 24 Jul 1857. Fox's case eventually reached The Court of Inquiry, a body with review powers under the Mutiny Act of 1853 and 1854 (17 and 18 Vict. C. 4 1854), see H. Bokerly Thomson, pp. 109-116.

³⁴ Lord Edward Stanley, Letter to Lady Henrietta Maria Stanley, 10 Dec 1857, Mitford, Stanleys, p. 196.

³⁵ Annual Register, Jan 1858, p. 344; Mitford, Stanleys, p. 197.

³⁶ Registers of Baptism, St. James Church, Clapham Park, cited in Thompson, General Pitt-Rivers, p. 27.

³⁷ E. Altham, 'The Royal United Service Institution, 1831-1931' JRUSI, 76 (1931), 235-45. Shorter contemporary descriptions are found in: Tallis's Illustrated London, II, 312. 2nd Herbert Fry, London in 1885 (London: W. H. Allen, 1885), p. 21.

³⁸ Rules and Regulations for the Government of the United Services Institution, prep. Thomas Henry Willis (London: Thomas and Sons, n.d.); Royal United Services Institution, Annual Reports, beginning 1851.

the Institution's published records, joined soon after his return to England, and, evidently feeling that he made full use of what it had to offer, paid twice the required fee.

The United Service Institution's membership was recruited from a diverse number of areas. Most, of course, were military and naval personnel, with the former predominating. But a number of well-known representatives from the sciences and the arts, such as Francis Galton (1822-1911), the well-known demographer, and Owen Jones (1809-1874), a prominent member of the Society of Arts and the designer responsible for the colour scheme at the Great Exhibition, were given honorary membership, presumably to provide something other than a martial tenor to the Institution's activities. Prince Albert also took a personal interest beginning as early as 1842 and was later the Institution's patron. A Royal Charter followed in 1860. The membership increased considerably during the 1850s, reaching about 4,000 at the time of Fox's initial interest.

A number of Fox's acquaintances from the service and elsewhere were particularly active. Sir Henry Rawlinson, then courting Fox's sister-in-law Maud, used the Institution as one of the outlets for his researches, giving a paper on Persian swords in the summer of 1857, shortly before Fox's return from Malta³⁹. John Latham of Wilkinson's in Pall Mall, with whom Fox had worked for a short time at Woolwich, also presented a paper on swords⁴⁰. Sir De Lacy Evans, Fox's commanding officer in the Crimea, was a member as was Colonel Alexander Gordon, his superior at Enfield and the man after whom Fox had named his first son. Finally, Sir James Lindsay, commander of the Grenadier Guards was Chairman during the late 1850s and Fox's contemporary, Colonel F.W. Hamilton, the later historian of the Grenadier Guards, presented a model of the siege of Sevastopol to the Institution's collections in 1858⁴¹. There were, then, many with whom Fox had much in common.

The principal aim of the Institution was, as its founding prospectus of 1831 specified, 'to foster the desire of useful knowledge amongst the members of the United Service'⁴². In a sense it was both a club and a professional association, although the founding committee was careful that the emphasis should be placed on the Institution's professional and scientific activities rather than on its social life. In the late 1850s, that was even more evident. The military had been subjected to an enormous amount of criticism in the aftermath of the Crimean War. The public, which just a few years before had been so vocal in their support of the war—in the light of the Army's performance—had become largely disillusioned with the Army, particularly with the more aristocratic representatives of the officer corps. As a result, the military was portrayed increasingly as a kind of feudal carry-over—a sector of society out of place in the modern world⁴³. The

³⁹ Rawlinson's article is referred to in Fox's later *Catalogue*, p. 175.

⁴⁰ John Latham, 'The Shape of Sword Blades', *JRUSI* 6 (1862), 410-22. See Fox, *Catalogue*, p. 171.

⁴¹ Thornbury, III, 335. 'List of Annual Subscribers', *JRUSI* 2 (1858).

⁴² *Prospectus of the United Services Museum* (London: Printed Privately, 1831).

⁴³ The influential historian Henry Thomas Buckle wrote in 1857 that it was in 'the purely savage state...in which military glory is most esteemed, and military men most respected'. *History of Civilization in England* (London: John W. Parker, 1857), I, 175. Also see Wilson, 'The British

United Service Institution was intended, therefore, as a foil to that understanding, serving as a bastion of military progressivism and a place where committed professionals, such as Fox, could help redefine the military's place and its future role. The expanded membership of the 1850s and the Institution's more ambitious programme of lectures and publications were themselves signs of such a reappraisal.

For administrative purposes, the Institution was, in 1858, divided into five departments: the Library and Reading Room; the Military Department; the Naval Department; the Ethnographical Department and Antiquities; and the Natural History Department. Committees were appointed for each. Its facilities included the original neoclassical building in Whitehall Yard, a second building in nearby Scotland Yard and a lecture hall, erected only in 1849, located between them. The library was extensive and received a diverse number of journals, periodicals and other literature considered of interest to military men. Publications of the Zoological and Geological Societies, engineering treatises, grammars and lexicons, even the publications of various archaeological societies were included in its acquisition list. The reading rooms were open daily, and it is probable that Fox did much of his own reading there. Lectures were given bi-weekly, at least during the London season, and were apparently well attended.

Probably the most striking feature of the United Service Institution, from Fox's point of view, was its museum. A museum had been a principal element from the first. As the 'Old Egyptian Campaigner' who first recommended the formation of the society had recommended, such a feature would 'give a tone of science to the character of both services'⁴⁴. Also for several years, the Institution was known officially as the United Service Museum, its subsequent name having been decided on only in 1839. It was largely for its museum as well that the general public knew of the Institution, and it is evident that its Council and organizing committees recognized the museum's more popular side. Admission was free upon presentation of a ticket from a member. Those were, as one guide assured the reader, 'easily procurable', and as a result attendance figures were relatively high⁴⁵.

While natural history was represented at least until 1860, by far the greatest part of the Institution's collection was devoted to military subjects, as might have been expected.

Army and Public Opinion', pp. 3-4; Eric William Sheppard, A Short History of the British Army to 1914 (London: Constable, 1926), pp. 214-15; W.S. Hamer, The British Army Civil-Military Relations, 1885-1905 (Oxford: At the Clarendon Press, 1970), pp. ix-xi; H. G. de Watteville 'A Hundred Years of the British Army, Part I' JRUSI, 76 (1931), 289-90; Blake, p. 145; and Burn, pp. 143 and 259.

⁴⁴ Cited Altham, p. 235.

⁴⁵ Peter Cunningham, Handbook of London Past and Present, New ed. (London: John Murray, 1850), p. 517. Other descriptions are found in the Catalogue of the Library of the United Services Museum (London: By Order of the Council, 1837). Bosquecillo, A Visit to the United Service Institution (London: Parker, Furnivall, and Parker, 1849); Bohn, p. 583-4. Augustus Hare, Walks in London, 5th ed. (London: Smith, Elder, 1883) II, 242; Thornbury, III, 343-4; and The Queen's London (London: Cassell, 1896), P204. Individual donations are listed in the Institution's Annual Reports and JRUSI.

Relics such as Cromwell's sword, brocaded lace from Nelson's waistcoat, and the 'crimson sash by which Sir John Moore was lowered to his grave' were typical displays. One of the most frequently mentioned exhibits was the skeleton of Marengo, the 'barbed charger' which Napoleon rode at Waterloo. The museum included as well an extensive model room with exhibits ranging from ships through gun carriages to detailed plans of battles. The models were perhaps the most conspicuously educational feature of the collection. One exhibit, for example, traced the history of lifebuoys; another demonstrated, in a manner which suggests one of Fox's later series, 'The Gradual Development of the Life-Boat'⁴⁶.

The three largest rooms of the museum were devoted to the weapons collection, and it was obviously that aspect which held the most interest for Fox. The Western arms collection, while not nearly as extensive as that of the Tower, provided a fairly complete representation of the history of European weapons, ranging from swords and pikes to the latest military hardware. Following Meyrick's formula, the exhibits tended to be grouped ornamentally. Swords, for example, were displayed radially on the upper walls; halberds were ranked along the corridors; cannons were placed in the centre of the rooms. In contrast to the Tower, however, there were a greater number of modern weapons, in part because of their greater availability, but also in order that the public might be kept informed of new advancements in technology. Firearms, of course, were particularly well represented. John Petherick, writing in 1859, explained that the museum contained 'specimens of every description of firearm, from the crudest matchlock to the most perfect specimen of rifle of our own time'⁴⁷. It is clear that Fox also made frequent reference to it in the preparation of his own papers.

The most striking point of comparison from Fox's point of view was the Institution's assortment of non-western arms. One visitor's guide estimated that it contained 'the actual arms of every nation under the sun'⁴⁸. Fox himself pronounced it 'one of the best assortments of semi-civilised and savage weapons that are to be found in this country, or perhaps in any part of the world'⁴⁹. Through its diversity it provided what could be considered a tangible record of Great Britain's overseas involvement, and, in a sense, was interpreted as just such a testimony to the activities of British troops in foreign outposts⁵⁰. Assegais from Africa jostled up against clubs from the South Seas; bows and arrows from America were complemented by boomerangs from Australia. Indian and Chinese arms—the weapons of the 'semi-civilised' in Fox's terms—were particularly well represented, having been inflated considerably during the late 1850s in the aftermath of the Indian Mutiny and Chinese Opium Wars. Each was, in consequence, a gallery of its own. Finally, the collection was rounded out by an assortment of miscellaneous exotic objects, many of which were housed in what was called the Ethnographical Gallery. The latter

⁴⁶ Thornbury, III, 335.

⁴⁷ John Petherick, 'On the Arms of the Arab and Negro Tribes of Central Africa, Bordering on the White Nile', *JRUSI*, 4 (1860), 171.

⁴⁸ Bosquecillo, p. 2.

⁴⁹ Fox, 'Primitive Warfare I', p. 612.

⁵⁰ Altham, p. 242.

were gradually weeded out beginning in 1857, however, to make more room for the weapons; the largest sale, conducted by Sotheby's, took place in 1861⁵¹.

Far from being viewed as a mere assortment of curiosities, the Institution's collection was intended to serve as an illustrative collection of the whole history of military technology. There were complaints about its lack of organization, its lack of labelling⁵², but efforts were obviously being made, as in other similar institutions of the time, to make the collection more interesting for the general public or casual visitor. Its overall message, moreover, was clear to anyone who visited. As one London guidebook explained: 'From the savage's war dress of skin and feathers to the latest improvements in armour plated vessels—from clubs and bows and arrows to the Gatling gun, the development of war materials can be traced through every stage'⁵³. That Fox understood it as such can be little questioned.

It is difficult to assess fully what impact the United Service Institution Museum may have had on Fox's own collecting scheme. He obviously spent a great deal of time there, and references to its collection occur repeatedly in his later writings. Original pieces from the Institution's collection were also used, 'with the permission of the authorities', as Fox pointed out, as models for a number of facsimiles in his own collection. He also obtained a number of pieces from the Institution's collection particularly during its sale in 1861, and possibly earlier.

In terms of arrangement the connection is even more striking. While most of the Institution's collection was displayed in what has been termed an 'ornamental' fashion, there was much about that method which suggested a comparative scheme like Fox's. Exotic arms, for example, following the example of antique arms, were often placed together by 'type'. The most complete description of the collection speaks repeatedly of 'tastefully grouped spears, paddles, clubs'⁵⁴. The many miscellaneous parts of the collection tended to conform to the same pattern. One case in the Chinese room was comprised of what were called 'idols'; another held 'musical instruments'. Both anticipate later series in Fox's collection. There were exceptions to the general theme, of course. A number of South Sea clubs were incorporated within a decorative display of flags, shields and swords at the museum's entrance; other pieces were simply placed where convenience dictated. But still the basic ingredients of what Fox later called the 'typological method'⁵⁵ were obviously present from the first.

Nonetheless, it is insufficient to say that Fox's scheme was simply a response to that of the United Service Institution. Other collections equally available to Fox, and clearly referred to by him at the time, such as the extensive armoury of the Indian Institution on Leadenhall Street or that of the Royal Asiatic Society on New Burlington Street, equally

⁵¹ Catalogue of the Ethnological and Miscellaneous Portion of the Museum of the Royal United Services Institution...24 Jul 1861, BL, SSC.

⁵² See Bohn, p. 584.

⁵³ Thornbury, III, 335.

⁵⁴ Bosquecillo, p. 7.

⁵⁵ Pitt-Rivers, 'Typological Museums', *Journal of the Society of Arts*, 40, 2039 (1891), 115-122.

could be said to have provided models⁵⁶. Each featured what were basically armouries, and again objects of similar function tended to be grouped together. The obvious point is, such a display method was so basic as to be hardly worthy of being called a method at all.

But still, the museum of the United Service Institution, if only because it was the chief focus of Fox's interest at the time, provided the closest model for his own work. While poorly organized, its aim was to illustrate the entire history of arms. It depended, as did Fox's collection, on exotic pieces as a means of filling in the historical record. Moreover, its general theme was, like his, a comparative one. Fox clearly saw his collection as an improvement on the example it offered, just as his earlier musket and rifle collection marked an improvement over those of the Tower of London and other armouries. There is little doubt either that he encouraged the Institution to reorganize its own series and actually helped rearrange a number of series during the general improvements of the early 1860s⁵⁷. The Institution's collection was, then, a mirror of Fox's ideals, suggesting the broad outlines of his own collection and the course that it would take.

4. Fox's First Professional Paper

It was not only the Institution's museum which was important to Fox, but its other activities as well. The Institution served, for one, as Fox's introduction to professional involvement. As such it provided a point of reference in which to define his own interests. It was a place where he could meet with like-minded officers, exchange gossip and discuss the latest administrative changes and developments in military technology. Finally, it was a place where he could carry out his own work and a forum in which to present his findings, including his first professional paper 'On the Improvement of the Rifle for General Service Use'.

The bi-weekly lecture series of which Fox's first paper was a part had been first established in 1849, or soon after the completion of the Institution's theatre. Lectures were delivered on Monday evenings, often lasting two or three hours. They were suspended, as were most London activities at the time, during the summer months. A journal for publication first appeared in 1858. The first volume recorded meetings and lectures of the previous year, or the first year of Fox's involvement.

A wide variety of topics was covered in the series from the beginning. Most papers were concerned with the latest developments in military technology and administration. The strategic importance of the railroad, the design of coastal defences, suggested improvements in dietary standards were typical subjects. Characteristically, military history was given considerable attention as well. The history of tents was discussed by Godfrey Rhodes and the Reverend George Gleig gave a paper 'On the Armies of Ancient

⁵⁶ James Peller Malcolm, Londinium Redivivum (London: J. Nichols and Son, 1802), I, 83-85; Payne, II, 328; Cunningham, 171-2; Tallis, II, 293; Thornbury, V, 108-10. On the Asiatic Society Museum, see: Bohn, p. 582; and Frederick Eden Pargiter, Centenary Volume of the Royal Asiatic Society of Great Britain and Ireland, 1823-1923 (London: Royal Asiatic Soc. 1923).

⁵⁷ Unfortunately, none of the unpublished records of the Institution survive. Fox's participation is suggested by remarks in his Catalogue, pp. 8, 14, 21.

Greece' in May 1857, or just prior to Fox's return from Malta⁵⁸. Papers on the colonies rounded out the programme: Captain C.H. Chesney, professor of history at the Staff College in Sandhurst, discussed the advantages of a New Zealand posting; John Petherick, Consul in the Soudan, gave a paper 'On the Arms of the Arab and Negro Tribes of Central Africa, Bordering on the White Nile'⁵⁹. Expressly following the example of the Society of Arts, lecturers were encouraged to illustrate their talks with maps, charts and models or, as with Petherick, with actual examples, all of which was to have some significance for Fox's own approach.

Papers on the new rifle were especially common, particularly during the late 1850s. Lieutenant Colonel Wilford, Fox's successor as Chief Instructor at the Hythe School, presented a paper entitled 'On the Rifle; Showing the Necessity of its Improvement as a Universal Infantry Weapon' in July 1857. J. Boucher discussed the Minié system over the course of a long lecture of 1858. Captain Tyler discussed the effect of the rifle on siege operations. In 1858 alone there were five papers on rifles, Fox's among them⁶⁰.

The great interest shown in the rifle was certainly understandable. If anything could be said to have transformed warfare over the course of the previous few years it was the new Minié and Enfield, as we have already seen. Tactics, training, fortifications, had all been altered significantly, since the Crimean War, as a result of their introduction. Huge sums had been spent on the introduction of the rifle, and even greater expenditures were forecast. Moreover, the rifle had become a virtual symbol of progress, not only among the military, but for the general public as well⁶¹. Volunteer military organizations, formed in great numbers after the Crimean War, held the rifle up as the harbinger of the future. Manufacturers capable of converting smooth-bore muskets to rifles sprang up in great numbers; the Patent Office was overwhelmed with applications for improvements, many from amateur inventors and volunteer riflemen. As C.H. Rhodes has observed, the rifle provided an opportunity for every citizen to make his personal contribution to the defence of his country⁶². In the hands of the volunteers, it was compared to the use of the bow at Agincourt⁶³. For many, therefore, the rifle was more than a mere technological

⁵⁸ Godfrey Rhodes' 'Tents', from their Earliest Period to the Present Time', *JUSI*, 3 (1859), 238-250; George Robert Gleig, 'On the Armies of Ancient Greece', *JUSI*, 1 (1858), 30-50.

Comparable articles included John Latham's 'The Shape of Sword Blades', *JRUSI*, 4 (1860), 410-422; and Sibbald David Scott's 'On the History of the Bayonet', *JRUSI*, 7 (1863), 333-348.

⁵⁹ C.H. Chesney, 'New Zealand Considered as a Field for the Emigration of Military Men', *JUSI*, 3 (1859), 271-289; John Petherick, 'On the Arms of the Arab and Negro Tribes of Central Africa, Bordering on the White Nile', *JRUSI*, 4 (1860), 171-77.

⁶⁰ E.C. Wilford, 'On the Rifle', *JUSI*, 1 (1857), 238-253; J. Boucher, 'The Rise and Progress of the Minié Expansion System', *JUSI*, 2 (1858), 144-159; and, 'The Comparative Merits of the Rifled Small Arms of England, France and the United States', *JUSI*, 2 (1858), 160-176; Captain Tyler, 'The Effect of the Modern Rifle upon Siege Operations', *JUSI*, 2 (1858), 225-252; and an 'Exhibition by Captain Norton of Rifles, Projectiles invented by him', *JUSI*, 2 (1858), 338-42.

⁶¹ See for example Curling's *A Few Words in Recommendation of a Volunteer Rifle Corps of 1852*. Also: Wilson, 'The British Firearm and Public Opinion', pp. 161-93; Sheppard, pp. 217-29.

⁶² Rhodes, p. 21.

⁶³ Scoffern, p. 15.

improvement; it represented the demise of the traditional military element, and the triumphs of science over the prejudices and privileges of the past.

Fox's paper 'On the Improvement of the Rifle as a Weapon for General Use', delivered at the Institution in May 1858, inevitably shared in that spirit. It was based, as Fox explained, largely on his earlier researches and on his work at Woolwich, Hythe, Enfield and Malta. Because of that, it was as much a survey of his involvement as a general history of the rifle. Fox obviously intended as well that it should serve as a defence of his own work and of his training methods at a time when they were still being questioned. The Chairman, Sir James Lindsay, apparently conspired in his strategy, praising Fox's work and giving him credit for the foundation of the Hythe School and the methods used there. Colonel Gordon was also in the audience and offered further testimony in favour of his past subordinate. Again, his remarks had the flavour of pre-arrangement⁶⁴. Fox himself was careful to avoid controversy, and gave full credit to Hay's contribution, defending as well Hay's inconclusive tests on the new Lancaster, a project in which Fox had also been involved.

Fox presented the history of the rifle's development as the product of a single continuity:

But of all the numerous contrivances which in successive ages have been put forward for the improvement of the musket, some few may be taken to serve as links in the chain of progress, whilst others have branched out of the main line, and contributed nothing of permanent utility. In tracing the history of the rifle through its various phases, I therefore propose to confine my remarks to what may be considered the main chain of improvement, disregarding all those varieties which, however ingenious in themselves, have embodied no principle or practical benefit to our own times, nor served as stepping-stones to further improvement⁶⁵.

Disregarding, as he explained, those weapons which preceded firearms, his account began with the introduction of hand-cannons in the fifteenth century and then proceeded to discuss improvements to those over the course of subsequent centuries. Changes in projectiles and new firing mechanisms were each touched upon. Transitional features, such as the early introduction of rifle barrels, were introduced as 'links' or 'intermediate steps'. The whole suggested an implicit teleology. Adjectives such as 'increasing', or 'growing' and nouns such as 'progress', 'improvement' appeared repeatedly. About half the paper dealt with recent developments. The first military use of the rifle was carefully documented, with the introduction of the Minié system being given particular attention. The progression of projectiles was illustrated, presumably in larger scale than has come down to us, for the benefit of his audience. Finally, the Enfield and more recent Lancaster were discussed and their relative merits compared. Looking back, Fox explained, a single

⁶⁴ James Lindsay, Chairman's remarks, *JRUSI* 2 (1858), 453-4; Alexander Gordon, Discussion, pp. 487 and 488.

⁶⁵ Fox, 'Improvement of the Rifle', p. 455.

rule seems to have held. 'Throughout the whole history of the rifle,...the path of improvement has been stumbled upon, and followed by those who were in search of something likely remote from it'. Inventions had been put forward, rejected, and then reapplied again when conditions required them. It was, he implied, as if the whole process was subject to immutable laws, rooted not in metaphysics, but in practical needs. As he concluded at one point, 'in all things necessity, rather than foresight, has been the mother of invention'⁶⁶.

It would be misleading to attribute too great a significance to Fox's observations. Other military writers, as we have seen, had offered a similar picture of the rifle's development. Wilkinson, for example, had referred, much as Fox would, to 'the inundation of alterations, few of which deserve the name of improvements', also stressing that 'necessity, undoubtedly, led to the invention of many [weapons] and improvements'. Jervis White-Jervis had also emphasized that recent advances in military technology were the result of countless small contributions, many of which were merely repetitions of past ideas⁶⁷. But it was a short work published by the Patent Office in the same year as Fox's paper which most closely approximates the tenor of Fox's remarks. Entitled 'Abridgments of the Specifications relating to Fire-Arms and Other Weapons, Ammunitions and Accoutrements' the booklet was essentially a list of major innovations which had been granted patents between the years 1588 and 1858, covering therefore, roughly the same period as Fox's paper⁶⁸. The latter were, the author identified only as B. W. stressed, just a fraction of the total but nonetheless provided a clear picture of the many stages of development, or as he put it, the 'slow progress [of firearms]'. Its specific entries, he explained, not only offered 'an account of what has been done already, but anticipates the history of progress, and points out the course which it will take for many years to come'. Of the more recent applications, he emphasized, 'five-sixths of the applications related to old contrivances which had been patented over and over again' and further that 'a very large proportion of the so-called inventions (relating to firearms) of the present day were, in fact, old contrivances, sometimes modified and adapted to modern requirements, but very often identical to what had been tried and abandoned as useless long ago'⁶⁹. Again, the author implied, it was 'necessity', as Fox had put it, which provided the mechanism for their eventual selection.

Fox's own paper was received politely but not surprisingly it provoked little response. Colonel Dixon agreed, as did several others, that 'everything is ... in a state of progress, but nothing like perfection has been obtained, I believe, yet'. Colonel Gordon remarked sympathetically that 'it is a very dry matter out it is evident that he has paid great attention to the subject'⁷⁰. Again, far from being the startling anticipation of the

⁶⁶ Fox, 'Improvement of the Rifle', p. 476.

⁶⁷ Wilkinson, p. 71 and 72; Jervis, p. ix.

⁶⁸ B.W., Abridgments of the Specifications Relating to Fire-Arms and Other Weapons, Ammunition and Accoutrements, London, 1859. Fox's paper, while delivered in 1858, was not published until the following year.

⁶⁹ Abridgements, p. 1.

⁷⁰ W.H.M. Dixon, Discussion after Fox's 'Improvement of the Rifle', p. 486.

evolutionist perspective, as Fox later implied, it was a rather conventional explanation of what most perceived to be the mere facts of the matter.

5. Fox's Scientific Interests of the 1850s

Despite the relative conventionalism of Fox's paper of 1858, it does reveal the degree of his commitment to what might be called the scientific viewpoint. A growing number of other officers, especially those connected with the United Service Institution, shared in his interests. Indeed, recourse to the scientific method and the language of science was becoming a byword for professionalism. Increasingly a knowledge of zoology, botany, meteorology, was becoming an expectation among progressive officers. Papers such as that of F. W. Hutton, entitled 'The Importance of a Knowledge of Geology to Military Men', were becoming typical fare at the meetings⁷¹.

But for Fox the commitment to science assumed even greater proportions. The reasons for that are various. It can be assumed that the Stanleys had some influence. Lady Stanley was a habitu  of the Royal Institution and other Victorian scientific societies. Most of her children followed her example. Scientific lectures were, in fact, a typical evening's pastime, fulfilling the peculiar nineteenth century taste for enlightened entertainment and self-improvement. That Fox should have been drawn into the same pattern, particularly given his prior involvement in the United Service Institution, was only to be expected. Moreover, his own interests, tied as they were to scientific advancement, almost demanded his participation⁷².

Fox was eventually active in a number of scientific societies. Membership in the Geographical Society came in March, 1859. He joined the Ethnological Society in 1861, the Anthropological Society in 1865. Other memberships and fellowships came slightly later; the Geological Society in 1867; the British Association in 1868; the Royal Institution in 1871; the Royal Society in 1876; and, finally, the Zoological Society in 1885⁷³. Most lectures, however, were open to non-members and while difficult to document, it is clear from Fox's later writings that his involvement typically preceded

⁷¹ F.W. Hutton, 'The Importance of a Knowledge of Geology to Military Men', *JRUSI*, 4 (1862), 342-360. Also, W.H.M. Dixon, 'An Outline of Studies Recommended to a Young Officer', *JRUSI*, 6 (1862), 84-99.

⁷² On the interconnections between scientific and professional societies, see George A. Foote 'The Place of Science in the British Reform Movement, 1830-50', *Isis*, 42 (1951), 192-208.

⁷³ Several of Pitt-Rivers' memberships are listed in Gray, 'Lieut.-General Pitt-Rivers', p. 64. For others I am indebted to the archivists of each society: C. Kelly, Royal Geographical Society, Personal Communication, 22 Oct 1979; Jill Swart, Royal Anthropological inst., Personal Communication, 28 Jan 1980; Rosemary Evans, Geological Society of London, through F. B. Atkins, Personal Communication, August 1980; Sarah Wilcox, British Association for the Advancement of Science, Personal Communication 15 Jan 1980; S.M. Arnold, Royal Institution, Personal Communication, 29 Nov 1979; N.H. Robinson, Royal Society, 20 Feb 1980; R. Fish, Zoological Society of London, Personal Communication, 9 Jan 1979. In each case, certificates or forms of recommendation are deposited in the society's archives. For the Ethnological Society and Anthropological Society I have depended as well on unpublished minutes and subscription lists, Anthropological Society Archives, AI, A 3:1.

membership. That was particularly true at the Royal Institution and the Geological Society, both popular forums at the time.⁷⁴

One figure who apparently had some influence on Fox and his view of himself as a scientific amateur was the geologist Sir Philip de Malpas-Grey Egerton (1806-1881)⁷⁵. Egerton was a close personal friend of the Stanleys. For a short time his son's name was connected with that of Alice. Egerton had been up at Oxford around the same time as the Second Lord Stanley. Both were at Christ Church. He became active in politics in the early 1830s, again standing for Cheshire. Between 1835 and 1868, he represented the southern district as a Tory, while Lord Stanley was the Whig member for North Cheshire. Contacts, therefore, both professional and private, between the two were frequent, and Egerton was often a guest at Alderley and at the Stanleys' London house, particularly during the late 1850s, when Fox was most often present.

While Egerton's vocation was politics, his main interests were geology and paleontology. At Oxford he had studied under Conybeare and Buckland. He had begun his own collection while still an undergraduate, spending long vacations in search of additional specimens, principally of fossil fish. He was a Fellow of the Geological Society from 1829, and was elected to the Royal Society in 1831, at the early age of 25. A catalogue of his collection was first published in 1837, and revised periodically⁷⁶. He was active in various antiquarian societies, contributing frequently to publications such as the Camden and Chetham Societies as well as forming a private collection of antique arms of his own, obviously a fact of interest for Fox⁷⁷.

⁷⁴ Guest books appear to have been one of the first things to have been discarded by scientific societies during more recent consolidations of archives. Only a few societies still possess them; those of the Geological Society, unfortunately, are not available for general reference. In all societies, ordinary—as opposed to business or council meetings—were open to the public at least on the invitation of a member.

⁷⁵ DNB; 'Egerton', Obituary Notice, JGSL, 38 (1882), 46-8. The connection is particularly stressed in Thompson, General Pitt-Rivers, pp. 19-20. The Stanley connection is outlined in Mitford, Stanleys, pp. 185, 222 and 286. See also Obituary Notice, Nature, 23 (1881), 579-80.

⁷⁶ Philip Grey Egerton, A Systematic and Stratigraphical Catalogue of The Fossile Fish in the Cabinets of Lord Cole and Sir Philip Grey Egerton, (London: Printed Privately by Richard and John E. Taylor, 1837). A possibly earlier version (1835?) was published in Chester by J. Seacomb. For a more complete list of Egerton's publications, see Memoirs of the Geological Society of the United Kingdom, 2 vols. (London: Longman, Brown, Green and Longmans, 1857-61). Egerton's collection is described at length in Leonard Huxley, The Life and Letters of Thomas Huxley (New York: D. Appleton, 1900), I, 44, 144, 190-1. See also Arnold Guyat, Memoirs of Louis Agassiz (Washington, D.C.: 1886), II.

⁷⁷ Typical were: Sir Philip Grey Egerton, Papers Referring to Elections of Knights of the Shire for the County Palatine of Chester (Chester: Privately Printed, 1852); A Short Account of the Possessions of Oulton (London: Hatchards for private distribution, 1869). Another Egerton, the Honourable Wilbraham, (b. 1832), was a noted arms collector, clearly known to Fox. See An Illustrated Handbook of Indian Arms (London: William H. Allen, 1880). Both Fox and Egerton were active at the Archaeological Institute. See AI General Minutes, II, 24 Jul 1865.

It was a fortunate acquaintanceship from Fox's point of view. Egerton was in a position to be extremely useful for a young man with scientific interests. He could insure introductions, provide tickets for lectures and influence membership committees. It was at least in part through Egerton that Fox first became acquainted with other well-known scientists, such as Joseph Prestwich (1812-1896) and John Tyndall (1820-1896), both of them later supporters in scientific societies⁷⁸. That he was not in fact one of Fox's sponsors for his later election to the Royal Society is curious, although that could well be accounted for by the fact that Fox was put forward primarily for his archaeological activities, and therefore his certificate of candidature was necessarily supported by other archaeologists and anthropologists. Otherwise, Egerton was helpful, influencing Fox, at least through example. Also, as Thompson has argued, Egerton's collection may have acted as a further incentive to Fox at a time when his own collection was beginning to assume more ambitious proportions⁷⁹.

Another Stanley acquaintance important to the development of Fox's early scientific interests was the well-known anatomist and natural scientist Richard Owen (1804-1892). As with Egerton, Owen was frequently present at Stanley gatherings and corresponded regularly with Lady Henrietta Maria. He was also one of the principal advisors to Lord Edward's uncle, Edward Stanley (1779-1849), the Bishop of Norwich and an amateur naturalist, and was involved with Lord Stanley in a number of areas due to Lord Stanley's position as President of the Board of Trade⁸⁰. Owen's principal claim to authority was his position as Conservator of the Hunterian Museum at the Royal College of Surgeons, then located at Leicester Square. Since 1836, he had held the post of Hunterian Professor, for which he was required to give a yearly quota of twenty-four lectures on the Hunterian collection. Beginning in 1856, or around the time Fox must have first met him, he had accepted the position of Superintendent of the natural history collections at the British Museum, still located at Bloomsbury, but later to be moved to South Kensington. As with Fox at a later period, he was an outspoken advocate of popular education, had helped organize the Great Exhibition of 1851, and had been influential in establishing natural history as a subject at the Crystal Palace at Sydenham, the Exhibition's successor⁸¹.

Again, Owen was a particularly advantageous contact for someone like Fox. Even more than Egerton, Owen was able to help pave Fox's entry into the scientific community, largely through introductions. He also helped Fox in his application for membership in the Geological Society of London⁸², and introduced Fox to other scientists, including several members of the Ethnological Society. Later he advised him on his archaeological

⁷⁸ Certificate of Candidature, Royal Society, 5 Feb 1875. Both Tyndall and Prestwich were Stanley acquaintances as well.

⁷⁹ Thompson, *General Pitt-Rivers*, p. 20.

⁸⁰ Mitford, *Stanleys*.

⁸¹ Biographical information on Owen is taken from *DNB* and Richard Starton Owen, *The Life of Richard Owen*, 2 vols. (London: John Murray, 1894). On Owen's work at Sydenham: 'The Crystal Palace', *Quarterly Review*, 96 (1855) 103-54.

⁸² Geological Society of London Archives, Personal Communication, Rosemary Evans through Brian Atkins, August 1980. Owen was a principal sponsor from 'Personal Knowledge'.

discoveries⁸³. If, therefore, Egerton provided inspiration, Owen provided the direct link to scientific involvement.

It was not as the Owen and Egerton connections suggest, however, simply a matter of influences; the extension of Fox's interests and his reassessment of himself as a scientific amateur point to something far more fundamental, tantamount, in fact, to a spiritual conversion. Fox was, from all indications, a conventional Victorian rationalist. He had never been particularly active in the church, nor were most of his acquaintances and relations, with the exception of one or two of the Stanley relatives. On the surface, he followed a traditional pattern. His children were christened in the Church of England, and he occasionally attended services while in residence at his later estate at Rushmore. But such activities were obviously more a matter of public form than an expression of Fox's own religious views. As demonstrated in his papers of the late and early 1860s, his own viewpoint was more skeptical. He referred, for example, to the misguided attempts 'to deify secondary causes' and of 'the numerous errors of Noachian chronology'. In defence of his later Sunday afternoon entertainments at Farnham grounds, he explained simply that 'the Sabbath was made for man, and not man for the Sabbath'⁸⁴.

Such a practical viewpoint was to be expected. For one, it was characteristic of a man of Fox's training and interests. Moreover, it was a typical position for someone of his generation and class. The British Quarterly announced as early as 1845, that less than a quarter of the upper class considered themselves practicing Christians or believed in Divine Revelation⁸⁵. By the late 1850s, Kitson Clark has estimated, the number was smaller yet⁸⁶. As John Morley said of the time, 'it was an age of science, new knowledge, searching criticism, followed by multiplied doubts and shaken beliefs'⁸⁷. The findings of paleontologists and geologists, the popular writings of naturalists, the critical theology of Feuerbach, the whole range of what Morley called 'the dissolvent literature'⁸⁸ all combined, in a sense, to make it increasingly unlikely that someone with any claim to scientific knowledge and education like Fox would consider himself an orthodox Christian.

⁸³ Fox, 'On Objects of the Roman Period Found Near the Old London Wall', AJ 24 (1866), 61-63.

⁸⁴ Fox, 'Primitive Warfare II', p. 437. Fox, 'On Early Modes of Navigation', JAI, 4 (1875), 432; I am indebted to Mr. John Moss-Eccardt for his comments on Pitt-Rivers' religious views, Personal Communication, John Moss-Eccardt, 6 May 1977. The most complete statement of Pitt-Rivers religious views is found in his unpublished speech before the Whitechapel Foundation School, 1875, SSW, PRP, P42.

⁸⁵ Rev. of Elements of Church History by David Welsh, British Quarterly Review, 2 (1845), 72-90. Also cited in Burn, p. 274.

⁸⁶ Kitson Clark, p. 286.

⁸⁷ John Morley, Recollections, in The Works of Lord Morley (London: Macmillan, 1921), I, 99-100.

⁸⁸ John Morley, Miscellaneous, in Works, III, 242. Stressed also in Burn, pp. 273-4; Young, pp. 74-75; Houghton, pp. 20-25; Ideas and Beliefs of Victorians, 'The Age of Doubt'; Willey, pp. 214-15; and Gillispie.

But to what degree Fox viewed his own position as an abandonment of traditional practise or belief—if indeed such were ever that deeply instilled in him—is less clear. Many Victorian families were, as Walter Houghton reminds us, torn by the problems engendered by religious doubt⁸⁹. The correspondence and writings of such prominent representatives of the era as the Froudes, the Arnolds or the Martineaus certainly suggest such a strain⁹⁰. The Stanleys revealed the entire range of loyalties from the open agnosticism of the parents, to the evangelical habits of Maud and the High Church and the Catholic reaction of their youngest son. Fox, by all indications, took a middle position, as he did in many things. Never openly agnostic, he acquired nonetheless, an empiricist's distrust of revealed knowledge.

But despite his open skepticism, Fox also assumed a growing faith in the secular world and, as he put it, 'the great law of nature'. The same religiosity recurred in his views on progress or 'advancement'. 'The more comprehensively the subject is viewed' he explained in reference to Darwin's theory in 1867, 'the more evident it becomes that in his social advancement, his laws, arts, and wars he moves on under the influence of the same laws which have been in force since the first dawn of creation'⁹¹. Increasingly, too, phrases such as 'modern science' or the 'inductive method', took on an almost pietistic tone. 'Nature' was increasingly used in the same sense as 'Divinity'; 'Natural Law', in turn, replaced 'Divine Law'; the 'scientific method' or 'theoretical stage' as Fox phrased it, replaced 'metaphysics'⁹². As with countless others of his generation, science was becoming for Fox a religion in itself, carrying man 'onward and forever onward, mightier and forever mightier', as George Henry Lewes had put it, 'in its wonderful tide of discovery'. In Fox's terms it had become simply a 'work of all time'⁹³.

6. Membership in the Royal Geographical Society

Surprisingly, one of Fox's earliest documented commitments to scientific amateurism was not to one of the more traditional focuses of scientific interest, such as the Linnaean or Geological Societies, but rather to the Royal Geographical Society. In part it was a matter of convenience. A number of Fox's acquaintances from the United Service Institution were already members, as were several of the Stanleys and their friends. His election, as a

⁸⁹ Houghton, p. 83.

⁹⁰ Froude's own struggle is described in his The Nemesis of Faith 2nd ed. (London: John Chapman, 1849); that of Carlyle in James Anthony Froude, Thomas Carlyle: A History of His Life in London (London: Longmans, Green, 1890), 310-11. Matthew Arnold describes his struggles in Literature and Dogma: An Essay Towards a Better Apprehension of the Bible, (New York: MacMillan, 1883), pp. 98-104, 209-15. Harriet Martineau describes hers in her preface to Comte, The Positive Philosophy, p. xiv; and Autobiography (with Memorials by Maria Weston Chapman) 2nd ed. (London: Smith, Elder 1877), I, 356-7. Leslie Stephen's loss of faith is described in Frederic William Maitland, The Life and Letters of Leslie Stephen (London: Duckworth, 1906), p. 144; Beatrice Webb's is described in My Apprenticeship (New York: Longmans, Green, 1926). For a general discussion see Willey, p. 217.

⁹¹ Fox 'Primitive Warfare I', p. 614.

⁹² See Fox, 'Primitive Warfare' II, p. 403; 'The Evolution of Culture', pp. 496-99, for two examples.

⁹³ George Henry Lewes, Biographical History, I, xi; Fox 'Primitive Warfare II', p. 401.

result, was assured. Also, requirements for membership were far less stringent at the Geographical Society than at the other, more specialist societies; all that was required was the support of four members, and Fox already had that⁹⁴. Finally, Fox had as yet made no major contribution to the scientific literature, other than his paper on rifles, as was often required. The Geographical Society was, in short, a respectable beginning.

One of Fox's principal supporters at the Geographical Society was Henry Rawlinson, the well-known Assyriologist. Rawlinson had been a close friend of the Stanleys for a number of years and had courted Alice's sister Maud during the early 1850s. He returned to London in 1859, after having served for several years as Plenipotentiary to the Court at Persia. During the spring he was frequently with the Stanleys, attending dinners and picnics as well as other family occasions. His nomination of Fox took place in March of the same year⁹⁵.

Rawlinson's influence upon Fox was an important one. Like Fox, he had begun his career as a soldier, serving first in the East India Army and then in a series of staff offices, including that of a political agent for the East India Company in Afghanistan. He was also a noted military reformer, having helped reorganize the Persian army along European lines. He was, as well, an amateur collector, both of natural history specimens and antiquities, collaborating with Orientalists, including Henry Stanley, in his work⁹⁶. His best known accomplishment had been the decipherment of the Persian Cuneiform, a project he had first become involved with in 1844, while serving as consul at Baghdad, and had first published in 1846. His book Notes on the Early History of Babylonia of 1854, had made him an instant celebrity⁹⁷. Knighthood had followed in 1856, or around the time Fox and he must have first met.

Rawlinson's main importance in terms of Fox's interests was that he combined the qualities of scholarship and practical involvement in a way which anticipated Fox's own approach to knowledge. While primarily an antiquarian and geographer, Rawlinson was also a 'scientist', well-versed in botany and astronomy and familiar with techniques of geological and geographical description⁹⁸. Notes on the Early History of Babylonia

⁹⁴ Personal Communication, Christine Kelly, Librarian, Royal Geographical Society. Edward Henry Stanley, Fox's brother-in-law, had been a member since 1853. Membership list, JRGS 27 (1857), xiv-xliii. General background on the Society taken from Bohn, p. 583, and J. W. Freeman, A Hundred Years of Geography (London: Duckworth, 1961).

⁹⁵ Biographical information on Rawlinson is from the DNB and George Rawlinson, A Memoir of Major-General Sir Henry Creswicke Rawlinson (London: Longmans, Green, 1898). The Stanley connection is deleted in Rawlinson's official biography. See, however, Mitford, Stanleys, pp. xviii, 167, 196 and 259 and Obituary, Athenaeum, no. 3515 (March 1895), 313-14.

⁹⁶ Henry Stanley for a short time was considered for the post of Rawlinson's assistant in Persia. See Mitford, Stanleys, p. 259.

⁹⁷ Henry Creswicke Rawlinson, The Persian Cuneiform Inscription at Behistun, 2 vols. (London: J. Parker, 1846-49); Notes on the Early History of Babylonia (London: John Murray, 1854).

⁹⁸ Early contributions to the Geographical Society included: 'Notes on a March from Zohab...to Kirmanshah...', JRGS, 9 (1839), 26-116; and 'Notes on a Journey from Tabriz...to Gilan...', JRGS, 10 (1840), 1-158; Other well known works included: Memoir on the Babylonian Assyria Inscriptions of Western Asia, 5 vols. in 1 (London: R.E. Bowles, 1858-60; rpt. 1861-84).

represented a breakthrough in archaeological writing, based less on general evidence than on a critical analysis of both the Cuneiform texts and other remains. The same was true of his other work. Fox was evidently appreciative of Rawlinson's contributions, referring to his work occasionally in his own writings⁹⁹. Most importantly, however, Rawlinson provided a model for what could be accomplished.

Another of Fox's sponsors at the Geographical Society was Sir Roderick Impey Murchison (1792-1871)¹⁰⁰. Murchison was at the time the preeminent geographer in Britain. He was President of the Geographical Society, having been elected in 1857, and was instrumental in redefining the interests of the Society and increasing its membership after a long-standing decline. During the late 1850s he had promoted several well-publicized African journeys, including those of Speke and Burton 'in search of the Nile' for which support had been given by a Royal Geographical Society grant, and for which the Society received wide acclaim. At the time of Fox's initial membership, the latter was probably the most important topic of interest, Burton and Speke having just returned from their first expedition in 1858¹⁰¹. Fox and Murchison probably first met through the Stanleys. Lord Stanley was during this period the President of the Board of Trade and contacts between his agency and the Geographical Society were frequent. Again, as with Rawlinson, Murchison was also a family friend¹⁰².

The main importance of Fox's involvement in the Geographical Society was that it represented a turning from the more specialized interests of the United Service Institution toward the interests of a far larger and more generalized scientific community. Of course, many of the Geographical Society's members remained military men. Among them were several of Fox's friends such as Colonel Gordon and Captain Douglas Galton, both active in the United Service Institution as well¹⁰³. But many more members were recruited from the wider scientific community, including figures such as Clements Markham (1830-1916), the well-known topographer, or the demographer, Francis Galton, and only had a marginal connection with the military. There were also a number of members from the ethnological and antiquarian community, including Henry Christy (1810-1865), Thomas Hodgkin (1798-1866), Robert Schomburgk (1804-1865) and R.G. Latham (1812-1888), and here Fox's interests become even clearer. In short, the Society was to serve as a bridge to his later scientific involvement, particularly his involvement as an ethnologist.

7. The Impact of Bray and Darwin

Fox's redefinition of himself as an amateur scientist is revealed most clearly in his readings of the period. First of all, his three, nearly four-year break from special assignments provided him with the opportunity to fill in the gaps in his education and, in

⁹⁹ Fox, Catalogue, p. 55. Also see Fox 'Primitive Warfare II', n. p. 623 and p. 641.

¹⁰⁰ Biographical information from DNB, and Freeman, pp. 28, 42-43 and 67-69.

¹⁰¹ Richard F. Burton and J.H. Speke, 'A Coasting Voyage for Mombosa to the Pangani River... ', JRGS, 28 (1858), 188-226; Richard F. Burton 'The Lake Regions of Central Equatorial Africa... ', JRGS, 29 (1859), 1-454.

¹⁰² Mitford, Stanleys.

¹⁰³ Membership List, JRGS, 27 (1859) 7, xiv-xliii.

turn, to embark on a conscientious programme of self-education. The United Service Institution and the Geographical Society offered the resources. Finally, the Stanleys again provided the impetus. Early in 1861, Kate Stanley observed:

Augustus is very full of Plato just now & likes it so much, also a book on education by Bray which he gave me to read & I did so it rather on the phrenology system and makes out that we are all born with certain faculties only in the brain & that it is useless to expect anything if it is not in the skull. I never knew anyone put his ideas and principles so little into practise as Augustus...¹⁰⁴

Other readings, as indicated in his writings of the 1860s, included Locke and Hume, Mill's Psychology and, through Mill, Hartley's concept of associationism. There are hints as well of Comte and Spencer and, through both, of Schelling and Von Baer¹⁰⁵. There are less direct suggestions of Carlyle and Coleridge, of 'committed' novelists such as Hugo and Dickens¹⁰⁶. Mostly, however, it was popular scientists to whom he turned: J.S. Wood, Edward Forbes, Tyndall, Prestwich and Huxley, all of whom were popular lecturers as well¹⁰⁷.

Fox's reading of [Charles] Bray (1811-1884) during that period is particularly revealing. Bray's importance has been generally overlooked among historians of ideas. Lyell, Huxley and Darwin have tended to be singled out as the principal, and hence only, figures of real influence during the period. But with the rediscovery by Anthony Walsh and David De Giustino of George Combe (1788-1858), and of the widespread interest of Victorians in the ersatz science of phrenology, Bray's place, if not his reputation, deserves a reassessment, particularly in the light of Fox's interests¹⁰⁸.

Bray's principal work, and the one to which Kate Stanley presumably was referring, was The Education of the Feelings, first published in 1838, and reissued, for the third time, in 1860¹⁰⁹. An educator himself, Bray was concerned to establish the 'natural' stages of

¹⁰⁴ Russell, Amberley Papers, I, 121.

¹⁰⁵ Spencer admitted that his own concepts of development derived in part from Shelling and von Baeur. Other influences included Lamarck and Malthus, both obviously important to Fox as well. See Herbert Spencer, Autobiography (New York: Appleton, 1904), I, 402; II, 9. Also, Thomson, Herbert Spencer, p. 62; and Herter MacPherson, Spencer and Spencerism (New York: Doubleday, 1906). See Fox, 'Primitive Warfare II', p. 400 and p. 405.

¹⁰⁶ Fox writes, in obvious paraphrase of Hugo's Notre dame de Paris, 'Generation has succeeded generation, and race has succeeded race, each contributing its quota to the fabrication of the edifice...' 'Primitive Warfare II', p. 401. The reference to Dickens is found in 'Evolution of Culture', p. 503.

¹⁰⁷ See 'Primitive Warfare I, II, III'.

¹⁰⁸ Anthony A. Walsh, 'George Combe: A Portrait of a Heretofore Generally Unknown Behaviorist', JHBS, 7 (1971), 269-78; David De Giustino, Conquest of Mind: Phrenology and Victorian Social Thought (London: Croom Helm, 1975). Also see A. C. Grant, 'Combe or Phrenology and Free Will: A Note on XIXth Century Secularism', JHI, 26 (1965), 141-47.

¹⁰⁹ Charles Bray, The Education of the Feelings (1838), 3rd ed. (London: Longman, 1860). A second edition was issued in 1849.

mental development 'which', as he explained, 'the Creator has established', and finally to draw attention to the parallels between individual development and that of mankind collectively, much as Fox had attempted to do in his own short paper. In his work Bray divided human sentiments into two general areas, or 'genera', as he phrased it: (1) propensities common to man and lower animals and (2) sentiments. Under the former were listed such traits as combativeness, destructiveness and acquisitiveness. Treated essentially as instincts, propensities were considered to rule development and, as in Comte's scheme, they were gradually replaced through the development of reason or 'sentiment'. Drawing specifically on the phrenological writings of Combe and, to a lesser degree, the Americans Fowler and Wells, Bray's basic assumption was that each individual could be said to possess each of those instinctual traits in varying proportions. The key to education, in turn, was to create a better balance among such traits, and more importantly, to control an individual's own 'propensities' and 'sentiments' through the development of his 'Intellectual Faculties'. He repeated his argument in his second work The Philosophy of Necessity; or, the Law of Consequences; as applicable to Mental, Moral, and Social Science, a title which in turn suggests the phraseology of Fox's first paper on rifles. A second edition appeared in 1863, or too late for Fox, although Mrs. Bray issued a popular work in 1860, called Pyssiology for Common Schools which contained much of the same material.¹¹⁰

The main interest of Bray, in terms of Fox's work, lies in his orderly description of the nature of development. Fox, we know, was interested in education at the time, having served as an instructor and, possibly even more importantly, because of his own children. His readings of Comte and Spencer and their shared emphasis on individual mental or 'psychological' development, as it was by now called, was important as well¹¹¹. Phrenology was also a popular subject and, for many, a well-accepted method of analysis. Even Queen Victoria and Prince Albert relied on a phrenological investigation, essentially a reading of the skull's outer surface, for an assessment of the character of Prince Albert and their other children¹¹².

¹¹⁰ Charles Bray, The Philosophy of Necessity; or, The Law of Consequences; as Applicable to Mental, Moral and Social Science, 2 vols. (London: Longman, Orme, Brown, Green and Longmans, 1841); Mrs. Charles Bray, Pyssiology for Common Schools (London: Longman, Green, Longman and Roberts, 1860).

¹¹¹ Spencer was himself interested in phrenology and presented himself for a 'characterisation'. See Autobiography, I, 228. Also see Henry George Atkinson and Harriet Martineau, Letters on the Laws of Man's Nature and Development (London: John Chapman, 1851), pp. 29-40; and A. R. Wallace, The Wonderful Century (New York: Dodd and Mead, 1898), 159-193.

¹¹² Elizabeth Longford, Queen Victoria: Born to Succeed (1965; rpt. New York: Pyramid Books, 1966), p. 217. Combe was called in personally. Combe's own works included: Essays on Phrenology; or An Inquiry into the Principles and Utility of the System of Drs. Gall and Spurzheim (Edinburgh, 1819; rpt. Phila: H.C. Carey and I. Lea, 1822); and A System of Phrenology (Edinburgh: Anderson, 1825). Equally influential at the time of Fox's interest was Fowler's Practical Phrenology (New York: Fowler and Wells, 1853) by Orson Squire Fowler (1809-1887) and Fowler's New Illustrated Self Instruction in Phrenology and Physiology (New York: O.S. and L. N. Fowler, 1859).

For Fox, Bray's interest was probably more general than immediate. Fox's main preoccupation was with the motivational force behind technological and scientific development. The impulse that directed man 'forever onward', as Lewes had put it, had, at the same time, provided the foundations for further progress, particularly among firearms and other weapons. Soon Fox adopted what he called 'the nomenclature of phrenology' to trace out the course of this development, as illustrated in his first paper on primitive warfare of 1867¹¹³. Bray was the obvious source of his information, and remained his principal reference in that area.

Another important influence of the period, and one which would even more fundamentally alter Fox's view of his work, was that of Charles Darwin (1809-1882). Darwin was, of course, inevitable reading at the time. On the Origin of Species by Means of Natural Selection was first published in late November 1859, just in time for the Christmas season¹¹⁴. It was a great commercial success, and new printings were called for immediately. Darwin had himself undertaken a new edition even before the end of the year and that was reissued in January 1860. Darwin's thesis, moreover, had been publicized for a considerable time; both Wallace and Darwin had presented papers at the Linnaean Society the previous year¹¹⁵. Many too were aware of the future implications of Darwin's work long before publication¹¹⁶. With publication it was evident to most thinking Victorians that some position had to be taken.

Fox was obviously aware of the controversy surrounding Origin of Species from the first. Egerton, whose own collection had formed the principal reference for the anti-Darwinian

¹¹³ Deville had a phrenological gallery on the Strand.

¹¹⁴ The first edition appeared on 24 Nov 1859 and was published by John Murray. The first edition of only 1,250 copies, sold out on the first day. The second edition consisted of a printing of 3,000. On its initial success see: Francis Darwin, ed., The Life and Letters of Charles Darwin (New York: D. Appleton, 1896), I, 70-71; Edward B. Poulton, 'Fifty Years of Darwinism', in Fifty Years of Darwinism: Modern Aspects of Evolution (New York: Henry Holt, 1908), pp. 8-56; G.T. Bettany, Life and Writings of Charles Darwin (London: The Walter Scott Publishing Co. [1913]), pp. 64-78; Geoffrey West, Charles Darwin: A Portrait (New Haven: Yale Univ. Press, 1938), pp. 249-50; and George Gayland Simpson, 'Introduction to Darwin, The Origin of Species by Means of Natural Selection' (New York: Collier Books, 1962). The best analysis of the popular reception of Darwin's work is found in Alvar Ellégard, Darwin and the General Reader (Goteborg; Distributed by Almquist and Wiksell, Stockholm, 1958). See also G.S. Carter, A Hundred Years of Evolution (London: Sidgwick and Jackson, 1957), pp. 55-70.

¹¹⁵ A.R. Wallace, 'On the tendency of Species to form Varieties; and on the perpetuation of varieties and Species by 'natural means of selection', Journ. of the Proc. of the Linnaean Soc. of London, 3 (1859), 45-62. See Gavin de Beer, 'Charles Darwin', Proc. of the Brit. Acad., 44 (1958), 163-83.

¹¹⁶ Darwin stressed the same himself in his preface to Origin of the Species, 6th ed. (1872; rpt. New York: Collier Books, 1962). The intellectual underpinning of Darwin's 'evolutionist' ideas has been stressed many times. For the best example see Arthur O. Lovejoy The Great Chain of Being: A Study of the History of an Idea (Cambridge, Mass: Harvard Univ. Press, 1936).

Louis Agassiz's work of the 1850s¹¹⁷, was certainly concerned with questions surrounding species change or transformation long before their concentration in Darwin's work. Other scientists with whom Fox was becoming acquainted at the time were similarly preoccupied. Richard Owen, also a family friend of the Stanleys, was in fact Darwin's principal opponent. Darwin's work was also a subject of widespread popular concern, discussed at dinner parties, clubs and scientific meetings. In late January of 1860, Kate Stanley apparently attended Owen's first public refutation of Darwin at the Royal Institution¹¹⁸. Even if Fox did not attend he would have been well aware of the importance of the debate.

Darwin's appeal for someone like Fox was more or less assured. As a member of what Jerome Hamilton Buckley called the 'scientific generation'¹¹⁹, Fox was attracted to Darwin's clarity, his impressive array of factual material and his self-evident empiricism. As an affirmed rationalist, Fox viewed Darwin's rejection of catastrophism, his implied disavowal of man's special creation, his general recourse to 'Natural Law' as simply an affirmation of his own views. Darwin's portrayal of the mechanism of species change, the brutal Malthusian image of conquest and defeat, which Darwin himself found uncomfortable but undeniable¹²⁰, also struck a particularly sympathetic note in a soldier like Fox. The view of nature 'red in tooth and claw', as Tennyson described it nine years earlier¹²¹, was matched, in a sense, by Fox's personal experience. Finally, Darwin presented a picture of historical development in many ways comparable to Fox's own, particularly as revealed in his paper on the rifle's development of 1858. It provided, overall, an image of process versus individual choice, of the small contributions of the many versus the conscious decisions of the few. It was, then, as much an expression of the progressive and reformist views of modern professionals, such as Fox, as a mere description of species change. Fox's experiences in the Crimea, his own problems with the authorities during the late 1850s and his inherent early liberalism all provided fertile ground for the reception of Darwin's ideas.

¹¹⁷ Louis Agassiz and A.A. Gould, Principles of Zoology (Boston: Gould and Lincoln, 1851); also see Edward Lurie 'Louis Agassiz and the Idea of Evolution', Victorian Studies, 3 (1959), 87-108; Louis Agassiz: A Life in Sciences (Chicago: Univ. of Chicago Press, 1960), pp. 90-100 and 223.

¹¹⁸ Russell, Amberley Papers, I, 72-73. The lecture was 'On the Cerebral Classification of the Class Mammalia', Journ. Royal Inst., 3 (1860), 174-186. An anonymous review by Owen was later published in the Edinburgh Review, 3 (April, 1860), 487-532. Earlier Owen had shown a predisposition toward Lamarckianism, as Darwin remarked himself. See Richard Owen, On The Nature of Limbs (London: Pamphlet published by the Royal Institution, 1959). Also Roy M. Macleod, 'Evolution and Richard Owen, 1830-1868', Isis, 56 (1965), 259-80; and Bernard R. Kogan, Darwin and His Critics (San Francisco: Wadsworth Publishing, 1980), pp. 178-80. Also, Loren Eiseley, Darwin's Century (New York: Doubleday, 1958).

¹¹⁹ Buckley, p. 183.

¹²⁰ Charles Darwin, The Autobiography of Charles Darwin (1809-1882), Nora Barlow, ed. (Collins: London, 1958), p. 124; de Beer, 'Charles Darwin' p. 182; and Barry G. Gale, 'Darwin and the Concept of a Struggle for Existence', Isis, 63 (1972), 321-44; and C. Neal, Charles Darwin and the Problem of Creation (Chicago: Univ. of Chicago Press, 1979).

¹²¹ Alfred Lord Tennyson, 'In Memoriam', The Poetical Works of Alfred Tennyson (New York: George Routledge and Sons, n.d.).

To say, however, that Darwin influenced Fox is probably not sufficient, nor does it give full credit to the complexity of the intellectual processes at work¹²². Fox in the end probably referred more frequently to Darwin in his own work than did most other anthropologists and ethnologists of his generation. In that he was more consciously 'a Darwinian' than 'they were, and therefore could be said to have owed more to Darwin. Darwin's concept of 'unconscious selection' was invoked frequently in his writings; and though interpreted in a manner quite differently from the way Darwin intended—Fox used it to refer to an inadvertent change to a new tool or weapon rather than the overall process of change as Darwin presented it—it still formed an important concept in his overall explanation. The biological image of organic growth, the genealogical tree of Darwin's presentation, was also a recurrent metaphor for Fox as well¹²³. Expressions such as the 'survival of the fittest' or the 'struggle for existence', themselves not strictly speaking Darwinian phrases but typically associated with Darwin's work, recur repeatedly, particularly in his earlier writings, although there the concept appears to have been surprisingly underplayed, particularly given Fox's military background¹²⁴.

Perhaps the most direct, and in a sense attributable, influence of Darwin on Fox, however, was in terms of his collection. Fox, it has been suggested, was already encouraged in his collection by other naturalists, including de Malpas Grey Egerton. Thompson, in fact, has argued that Egerton's example may well have suggested to Fox the idea of adopting a biological metaphor or, indeed, model for the organization of his own collection¹²⁵. The publication of Origin of Species would have helped underline the importance of his choice, if in fact it had been made before 1859. The leap from the paleontological sequence of Origin to the developmental sequence demonstrated by Fox's collection was an easy and, indeed, an almost certain one.

8. The Growth of Fox's Collection

By all indications, Fox's collection had been expanded considerably by the year 1860. His regimental duties made little demand upon him, and during much of this time he was effectively, if not officially, on leave in order to prepare for the inquiry being conducted

¹²² Pitt-Rivers' evolutionary ideas are commonly ascribed to Darwin, a point Pitt-Rivers himself denied. See O.M.D. Dalton, Rev. of The Evolution of Culture and Other Essays, ed. by J. G. Meyers, Man, (1907) 108-09; Lowie, pp. 19-20; Frese, p. 50. Thompson makes the same point, suggesting that Pitt-Rivers' ideas were 'modified' after reading Darwin. Thompson, General Pitt-Rivers, p. 31. On the overestimation of Darwin's influence upon anthropologists, see in particular Lienhardt, p. 8; and Burrow.

¹²³ For Fox's early reliance to Darwin. see 'Primitive Warfare I', p. 615; 'Primitive Warfare II', p. 406; 'Address, Brighton', pp. 158-9.

¹²⁴ The phrase 'survival of the fittest' is Spencer's; 'the struggle for existence', is attributed to Alfred Russell Wallace. On the derivation, see Darwin Life and Letters, II, 229, and Morse Peckham, ed. The Origin of Species by Charles Darwin: A Variorum Text (Phila: Univ. of Penn. Press, 1959), p. 22. Fox, in turn, rarely expressed what came to be known as a 'social Darwinian' stance. Rare exceptions can be found in 'Primitive Warfare II', pp. 399-400, and his Catalogue, p. 19, where he explains that 'natural selection would cause the survival of those that were best armed'.

¹²⁵ Thompson, General Pitt-Rivers, p. 31.

into his training methods. Much of his free time was spent searching out dealers and other collectors, attending auctions or meeting with prospective donors. He also made a point of visiting museums, often in search of ideal pieces, and subsequently facsimiles, for his series. Examples of parrying shields and boomerangs, major interests at least by the time of his first paper on primitive warfare in 1867, were found in the British Museum; bows and arrows were copied at the India Museum and even at the tiny Scarborough Museum in Fox's native Yorkshire¹²⁶.

Mostly, however, it was original materials which attracted his attention. Although the record remains unclear, a number of swords and other weapons had apparently been acquired as early as his time in Turkey and the 'Caucasus' (or Bulgaria). Several antique swords from Malta were presumably collected during his two-year assignment there or, again, possibly earlier. A number of pieces were apparently presented by his brother-in-law. Henry Stanley had expanded his travels in the Middle East by that period, and it is likely that some of the weapons from that area were acquired through him. The large number of pieces from Lucknow suggest Johnny Stanley, who had been stationed there during the mutiny, although that remains conjecture¹²⁷.

It was probably the United Service Institution, however, which gave Fox the greatest opportunity to add to his collection. The Institution was a typical gathering spot for soldiers and sailors returning from abroad. Many delivered papers on their travels; many more displayed the objects they had collected. On one evening in 1858, a Lieutenant-Colonel Hoag displayed his collection from Nubia composed of several rhinoceros shields, two clubs and one spear. Also on exhibit that evening were recent additions to the museum described as '1 do. Bow, 1 do. Quivers and Arrows...[and] 2 do. Swords'¹²⁸. When not offered to the Institution for its already crowded museum, collections such as those were fair game for Fox. As other members came to know of his interests, his acquisitions no doubt became even easier. An African shield, for instance, acquired at slightly a later date, is attributed to troops returning from Abyssinia in 1868¹²⁹. During the 1850s, in the aftermath of the India Mutiny and Opium Wars, the opportunities were no doubt even more frequent.

The single largest collection obtained under the auspices of the Institution was that of John Petherick (1813-1882), Her Majesty's Consul in the Soudan [*sic*] during the late 1850s and early 60s and a long-time trader in East Africa. Petherick, who is best remembered as one of the chief targets of the African explorer John Hanning Speke's anger following a misunderstanding over the delivery of supplies at the end of Speke's Nile expedition of 1861-63, had returned to Europe in 1859 to raise funds for further dealings, including arms purchases¹³⁰. In 1860, he presented his paper 'On the Arms of the

¹²⁶ Fox, *Catalogue*.

¹²⁷ Mitford, *Stanleys*.

¹²⁸ *JRUSI*, 2 (1858), 192.

¹²⁹ *Catalogue*, p. 116.

¹³⁰ See John Hanning Speke, *Journal of the Discovery of the Source of the Nile* (London: William Blackwood, 1863), pp. 606-08. For Petherick's version, see his *Travels in Central Africa and Explorations of the Western Nile Tributaries* (London: Tinsley, 1869), II, 20 and 78-81. R. L. Hill

Arab and Negro Tribes of Central Africa, Bordering on the White Nile', and displayed a number of objects from his own collection¹³¹. Involved as he was with trade in the region—Speke accused him of participating in the slave trade—he had been in a particularly good position to obtain good examples of local weapons. Exhibited at the time of his paper were a helmet decorated with shells and pearls, several battle axes and clubs and, finally, a number of staffs and spears including one ornamented, as Petherick took pains to point out, with a giraffe's tail. Many of those were Dinka; others were identified as Dor (or Djor), including an iron pick. Since their descriptions compare closely with those later recorded as part of Fox's collection, there is little doubt that the two collections were the same. In all, Fox attributed over thirty pieces to Petherick, gathered either all at once or over the course of subsequent years. It is likely that most of those were acquired around 1860, or at the time of Petherick's paper, although again, such a conclusion cannot be substantiated other than to note the fact that most of the Petherick pieces in his collection were listed as having been gathered sometime prior to 1858¹³².

Another explorer with whom Fox became acquainted around that time, and from whom he eventually obtained a number of pieces for his collection, was Richard Burton (1821-1890). Again, the association may have been formed at the United Service Institution, although strictly speaking, Burton was not a member during that period. He was, though, a member of the Geographical Society, the meetings of which Fox was also beginning to attend at the time. He also moved in the same social circles as Fox. Burton, for instance, was a close friend of Henry Stanley's and of Monkton Milnes, Maud Stanley's near fiancé, and had once hypnotized her sister, Kate, at a party at Milnes'¹³³. Finally, Burton was eventually a member of the Anthropological Society, an organization with which Fox was also associated after its foundation in 1863. If they had failed to meet by a date, therefore, it was certain that they knew each other at least by then or by the mid-1860s.

Burton and Fox had a number of things in common. Both had served in the Crimea and had spent some time in Turkey. Both were manifestly modern in their ideas: Fox, the practical man of technology; Burton, the outspoken critic of military affairs. Also, Burton, like Fox, was interested in the new rifle, later contrasting the performance of the flint-lock and Enfield during the Paraguayan Wars of the mid-1860s¹³⁴. Finally, Burton was a collector and, again of most interest to Fox, a collector of weapons. On his return

helped fill in some of the facts on Petherick's career and allowed me to see the proofs of his The Europeans in the Sudan, 1834-1878 (Oxford: At the Clarendon Press, 1980).

¹³¹ John Petherick, 'On the Arms of the Arab and Negro Tribes of Central Africa'. His collection is described also in his Egypt, the Soudan and Central Africa (London: William Blackwood and Sons, 1861), pp. 387-391, and Travels in Central Africa, II, 5.

¹³² Fox, Catalogue.

¹³³ Mitford, Stanleys, pp. 26, 27, 31 and 128. Other biographical material based on DNB entry; N.M. Penzer, 'Biographical Sketch of Richard Burton', Man 21 (1921), No. 42, 'Sir Richard Burton', Obituary Notice, JAI, 20 (1890) 295; Byron Farwell, Burton: A Biography, (New York: Holt, Rinehart and Winston, 1963); and Fawn M. Brodie, The Devil Drives (1967; rpt. Harmandsworth, Middlesex: Penguin Books, 1971).

¹³⁴ Richard Burton, Letters from the Battle-Fields of Paraguay (London: Tinsley Brothers, 1870), p. 168.

from his expedition of 1859, he brought a number of examples with him later 'demonstrating' them in his talks before the Royal Geographical Society¹³⁵.

Fox, it appears, had little opportunity to obtain any of Burton's earliest African pieces. Later acquisitions, however, did filter into his collection. A bronze dagger from Arabia, possibly a souvenir of Burton's famous pilgrimage to El-Medinah and Meccah, although just as likely obtained at a later date, was listed in his Catalogue of 1874. Another Burton contribution was sample of human hair from Palmyra, a most likely a reminder of his visit to Syria of the early 1870s, although possibly earlier¹³⁶. Again, however, Burton's main interest for Fox was as example rather than as a contributor. Indeed, it was collectors such as Burton who first encouraged Fox to become active in organizations such as the Geographical Society and, even more so, in the Ethnological and Anthropological Societies, where both were active over the next few years¹³⁷.

While sources such as those of Petherick and Burton suggest the direction of Fox's collecting interests were taking at the time, not all of his acquisitions of the period were ethnographical ones. A number of antique swords from Malta are an obvious case in point. Other objects apparently collected by that time included iron daggers discovered in the course of excavations in York, and an 'Iron Umbro shield' found near Bury St. Edmonds in 1851, an Etruscan girdle, an ancient Greek helmet and English bows and crossbows¹³⁸. Similarly his principal references remained, as his later writings suggest, Meyrick's Ancient Armour and Boutell's Arms and Armour, both standard references for arms collectors of the period¹³⁹. Despite, then, the growing number of ethnographical pieces, his aim was still to illustrate the history of arms and not merely to trace their range and distribution. Later acquisitions such as pikes, halberds and suits of armour, several of which were obtained from the Meyrick collection, merely helped underline his more long-standing interests.

Nonetheless, the very presence of ethnographical pieces had the effect of altering the character of his collection, even at that early period. The mere presence of objects such as African bows, Turkish scimitars or African spears, for one, suggested a collection of more ambitious proportions. The addition of boomerangs or East African parrying shields further emphasized that. If not, then, an ethnographical collection in concept, it was gradually assuming the basic outlines of one. Once the collection extended to materials other than weapons the link with traditional arms collections was broken even more. In short, the nature of the collection's growth was predetermining the course of Fox's own interests.

¹³⁵ Burton also published on swords and other weapons; see Burton The Book of the Sword (London: Chatto and Windus, 1884). One of his earliest works was Falconry in the Valley of the Indus (London: J. Van Voorst, 1852).

¹³⁶ Fox, Catalogue, p. 5; SSW, PRP, Corres.

¹³⁷ Unfortunately, other than occasional examples of later correspondence, little survives covering the Burton-Fox connection of these early years either in the Pitt-Rivers papers or those of the Royal Anthropological Institute.

¹³⁸ Fox, Catalogue, pp. 15-16.

¹³⁹ Catalogue, pp. 106, 183.

The first strong evidence of the extension of Fox's collection to include things other than weapons is found in the records of Sotheby's sales of the late 1850s and early 1860s. Surprisingly, Fox ignored a number of those, or at least did not purchase anything of note¹⁴⁰. Given the nature of several of the sales at the time, it is difficult to explain why he did not bid, unless he simply could not afford to or, as he claimed, he still avoided professional dealers. Most of the sales, however, involved prehistoric collections, including several of ancient British and Irish antiquities, and it is possible that Fox had less interest in those areas than he would at a later date.

The main ethnographical sale of the period was that of the surplus collection of the United Service Institution, and there Fox did buy extensively. Conducted by Sotheby's in June of 1861, the sale represented an effort to clean out much of the United Service Institution's surplus collection. Interestingly, most of the pieces were non-weapons. Included among Fox's purchases were a vase of undetermined origin, a model of a South American hut and a Swiss cottage, a 'Chinese wooden Harmonican' and a small portrait of Boadicea. The prices in each case were low; the most expensive item was the Boadicea portrait, for which he paid 10 shillings. The costs, then, were well in line with what he could afford. Other purchasers included his friend Arthur Tupper, from the United Service Institution, and Henry Christy, the famous archaeologist and ethnologist¹⁴¹. His collection was serving, then, not only to expand his own small museum but also to extend his acquaintances and reinforce those he had already established.

Another change in Fox's collection was in his characterization of it, particularly his overall reappraisal of the significance of its arrangement. The main organizational principle, according to Fox, was still to illustrate the 'continuity of forms'. Rifles were shown to have 'developed' out of muskets; muskets out of hand-cannons; hand-cannons out of cross-bows and so on. As the collection extended to other weapons, such as boomerangs or spears or shields, they were organized to demonstrate the same lesson. The newer series, however, were considered not merely an extension of the original series but as separate categories, forming, therefore, the comparative families or 'typological' groups of Fox's later collection¹⁴². Such a secondary division was based less on formal resemblance than on what might be called perceived functional affinities. Therefore, it departed slightly from Fox's original scheme. Once the collection grew to include other materials, such as house models, household utensils, musical instruments or examples of ornament, the latter pattern became perhaps even more important. The adoption of a biological metaphor served, then, as a theoretical overlay, unifying his different series according to 'families', 'genera' and 'varieties', and thereby providing, through an implicit reference to biological collections, the suggestion of continuity within

¹⁴⁰ For example, Fox is not listed among the purchasers at the sale of the antiquarian collection of John Huxtable, of 1 Jul 1859 or of that of Captain Edward Hoare of 21 Mar 1861. BL, SSC.

¹⁴¹ Catalogue of the Ethnological and Miscellaneous Portion of the Museum of the Royal United Services Institution... 24 Jul 1861, BL, SSC.

¹⁴² Pitt-Rivers, 'Typological Museums'.

a framework—the 'evolutionary phase' of which Fox later wrote in his essay on the 'Principles of Classifications' (1874)¹⁴³.

It would be misleading to suggest, however, that Fox's characterization of his collection in either Darwinian or Linnaean terms was in any sense a revolutionary step. John Scoffern, the military writer, wrote in 1852, of 'the leading varieties of breach-loading contrivances', stating further that he would 'treat these generically [rather] than specifically'¹⁴⁴. Other writers on technology adopted a similar phraseology, putting their arguments implicitly in scientific terms¹⁴⁵. Fox, then, was merely following the usual pattern of presentation.

Also, there is nothing to suggest that Fox's reference to his collection in biological or Linnaean terms was ever anything more than a casual one. Even in 1874, when he first formally presented his collection to the general public, the collection itself was not expressly organized in that way, although, in fact, he does refer to 'varieties' of objects or weapons in the course of his lecture¹⁴⁶. It is evident, too, that he did not label his series according to that plan, nor was it ever displayed in that way. Indeed there is nothing in any of the records of the collection to suggest that the biological system was ever anything more than a metaphor. Nonetheless, by referring to his collection in Linnaean or 'Darwinian' terms Fox was, however implicitly, assigning a new significance to it, implying a far more ambitious program than that of a private arms collector. Moreover, such a characterization presented or even determined new avenues for the collection's growth. Classes, genera and species suggested, or in a sense, generated other classes, genera and species. Missile weapons were matched by non-missile weapons; weapons by non-weapons. The very fact of the collection's extension required, then, something of a more fundamental reappraisal of Fox's aims. In effect, Fox's collection was becoming something far more than a mere private collection of arms. It was soon evident too that he would have to look elsewhere for his model.

Precisely what, then, was Fox's collection at the time? Because of its contents and because of Fox's supposed reliance on Darwin, it is generally assumed, in a rather vague way, that his collection was directed to the interests of anthropology or ethnology and, moreover, that Fox himself saw his collection as an alternative to other collections of a similar kind. But it is obviously not so simple. As we have seen, in large part the collection was still a weapons collection, and, even in 1874, as explained before, weapons remained the predominant element. Fox himself obviously still intended that his

¹⁴³ Fox, 'Principles of Classification'.

¹⁴⁴ Scoffern, p. 168.

¹⁴⁵ As Peter Conrad has argued, a comparable precision extended into every area of the mid-Victorian consciousness, from paintings to novels to sociological records. See Peter Conrad, The Victorian Treasure-House (London: Collins, 1973). Even the beds at the Botanic Garden had recently been 'disposed in conformity with the Linnaean system'. Bohn, p. 491.

¹⁴⁶ Fox, 'Principles of Classification', p. 294. In 1868, he also refers to 'the varieties of the general classes of implements which each country is capable of affording'. Fox, 'Primitive Warfare I', p. 438.

collection should be of continuing interest to fellow soldiers; his major professional papers of the late sixties were, in fact, all delivered at the United Service Institution.

Much about his collection was, however, implicitly ethnographical or ethnological, if only in name, and it can be assumed that Fox was aware of that even at such an early date. In future years, with ethnographical pieces becoming an even more important part of the collection the association became even more evident. From Fox's point of view, however, his collection remained primarily an historical one; ethnographical pieces continued to be assigned a kind of antiquity and were intended to serve as substitutes or as the 'missing links in the chain of progress', as Fox earlier put it. Their implicit reference was, therefore, still the technology of the modern world, not the exotic peoples who manufactured them.

To a certain extent Fox's collection might still be said to have taken its lead from other museums or exhibits of comparative technology, or even more specifically the industrial arts exhibitions of the late 1850s and early 60s. The biological metaphor and the implied reference to Darwin tends only to obscure that possibility. The basic resemblance between Fox's collection and exhibitions such as those at Manchester held in 1857 and at Edinburgh in 1860, remains a striking one¹⁴⁷. The modest galleries of Marlborough House, the Society of Arts' principal vehicle, again provides a parallel as does the South Kensington Museum then approaching completion just south of Hyde Park¹⁴⁸. In terms of physical arrangement, the resemblances between Fox's and exhibits such as those are even more evident. Following the initial example of the industrious young scientist, Lyon Playfair, at the Great Exhibition, most exhibits or art fairs continued to adopt a conscientiously 'scientific' method of display, organizing each display by section, sub-groups, classes and sub-classes. As with Fox's collection, each division was essentially comparative, and indeed as competitive categories for the award of prizes they were implicitly so. Each too was intended to convey some sense of the progress of each art, to illustrate as the Edinburgh Review, describing the Official Catalogue, explained, 'the living scroll of human progress inscribed with every successive conquest of man's intellect'¹⁴⁹. Subsequent exhibitions, of which Fox later spoke so highly, were intended to illustrate the same point. As with Fox's collection, each served as a record and a testimony to the technological progress of the world.

Fox's collection must, then, still be understood within such a greater context. Indeed, in many ways, it remained a mere reflection of mid-Victorian ideals. Even in terms of its size or comprehensiveness, it corresponded closely with contemporary tastes and ambitions. Its specific components were in synchrony with the penchant for the exotic in

¹⁴⁷ J.B. Waring; ed., Art Treasures of the United Kingdom for the Art Treasures Exhibition, Manchester (London: Day and Son, 1858); Board of Manufactures, Official Catalogue of the Exhibition of Industrial and Decorative Art, 1861, in the National Gallery Building (Edinburgh: Murray and Gibb for HMSO, 1861); Also see W. Luckhurst, The Story of Exhibitions (London: The Studio Publications, 1957); Steegman, pp. 209-21.

¹⁴⁸ See Charles R. Richards, The Industrial Museum (New York: The MacMillan Company, 1925); and Industrial Art and the Museum (New York: The MacMillan Company, 1927).

¹⁴⁹ Cited in Thomson, p. 103.

most households during the early 1860s. Its very bountifulness conformed to Victorian decorative ideals. As a private museum, it was also fully in keeping with social expectations, the gallery or museum becoming an increasingly necessary part of what the architect Richard Kerr called in 1864, 'the first class Mansion'¹⁵⁰. As Fox opened his own collection to the public over the course of the next few years, he was simply following in the steps of such well-known collectors as the Grosvenors, the Marquis of Hertford or the Duke of Sutherland, and, in a sense, emulating their example¹⁵¹. Most importantly, Fox's collection must be viewed as an expression of the scientific commitment of his generation. Huxley, Darwin and Forbes were all avid collectors and exhorted their readers and listeners to do the same¹⁵². Prince Albert helped set the example at Marlborough House in the 50s, meticulously ordering and labelling his own scientific and artistic collections, and again, encouraging others to follow his example¹⁵³. Collecting was viewed as a useful exercise in itself; Samuel Smiles considered the practice a fundamental part of his programme of Self-Help¹⁵⁴. As Fox's collection approached the 'proportions of a museum', as Tylor put it,¹⁵⁵ it merely demonstrated how fully Fox had accepted Smiles' lesson.

During the course of the next decade, however, Fox's collection was to become something far more individual. While still reflecting the predilections of his time, it increasingly focused on the problems and interests of two particular scientific and professional communities, namely, those of archaeology and ethnology. In consequence, it would be increasingly molded by their preoccupations and, over the course of the next few years, be altered significantly in the light of their interests.

¹⁵⁰ Robert Kerr, The Gentleman's House, 3rd ed. rev. (London: John Murray, 1871), p. 189. Also see Ralph Dutton, The English Interior, 1500 to 1900 (London: B.T. Batsford, 1948), pp. 169-73; Dutton, The Victorian Home (London: B.T. Batsford, 1954), pp. 84-87; David Rubinstein, Victorian Homes (London: David and Charles, 1974), pp. 68-9; and Gloag, Victorian Taste (London: Adam and Charles Black, 1962), pp. 137-8; Julian Barnard, The Decorative Tradition (London: The Architectural Press, 1975), pp. 42-45.

¹⁵¹ Bohn, pp. 379-440, on private collections open to public at the time. On the English collecting traditions; Francis Haskell, Rediscoveries in Art (Ithaca, New York: Cornell Univ. Press, 1976).

¹⁵² T.H. Huxley, 'Classification as a Logical Process', in Science and Education (New York: Appleton, 1901), pp. 118-19; Darwin, Life and Letters, I, 32; also see Walter F. Cannon, 'The Basis of Darwin's Achievement: A Reevaluation' Victorian Studies, 5 (1961), 109-11; Edward Forbes 'On the Vegetable World as a Contribution to the Great Exhibition', Art Journal Catalogue, appendix i.

¹⁵³ Winslow Ames, Prince Albert and Victorian Taste (New York: The Viking Press, 1968), p. 67. Also see U.C. Knoepflmacher, 'The Uses of Classification', Victorian Studies, 10 (1967), 763-72.

¹⁵⁴ Smiles, Self-Help.

¹⁵⁵ Tylor, 'Pitt-Rivers', p. 1141.

