

alike made an essential contribution to the development of the modern scientific outlook. And it was the bringing together of these two traditions by the introduction of English ideas into France and the combination of English empiricism with French rationalism that ushered in the Age of Enlightenment.

Throughout the eighteenth century there was an intense interest in scientific ideas which spread through every class of society from the courts to the bourgeoisie and changed the whole climate of European culture. It is true that the traditional forms of education long remained unchanged. Both in England and France the eighteenth century was an age of stagnation in the universities and colleges where the old scholastic methods remained almost unchanged, although they had entirely lost their vitality and their prestige. But outside the walls of the college, everything was being criticized and transformed. Not only were the most revolutionary theories of education being propounded by dozens of writers, but the *instauratio magna* which Bacon had preached had become a living reality—the dominant intellectual force in Western culture.

The basis of this new learning was a mathematical one. Mathematics took the place of scholastic logic and the classics as the fundamental subject, and there has never been an age in which the relations between mathematics and general culture were closer and in which men of letters, like Fontenelle and D'Alembert, made so large a contribution to mathematical studies. As A. N. Whitehead has said so well, "*Les philosophes* were not philosophers. They were men of genius, hard-headed and acute, who applied the seventeenth-century group of scientific abstractions to the analysis of the unbounded universe."¹ These men were superb publicists. They saw clearly and they

¹ *Science and the Modern World* (Penguin Ed.), p. 75.

wrote clearly, and whatever they did not see, they ignored. Metaphysics were mere nonsense; religious faith was superstition and mystery was muddle. The age lay wide open to the eye of the philosophic scientist and to the hand of the scientific technologist. All that was necessary was to make men reasonable by education and enlightened government and to free their minds from superstition and prejudice.

Thus the combination of Cartesian rationalism, Newtonian physics and Lockian empiricism produced a highly explosive compound which detonated in the second half of the eighteenth century and almost destroyed the traditional threefold order of Christendom—Church and State and Study. In England, where the Cartesian ingredient was absent, the progress of science had far less revolutionary effects. English Deism was a transitory episode. Science remained faithful to the fideist traditions of Bacon and Newton, and it was in the field of technology that the most important changes took place. In France, on the other hand, science became a philosophy, a creed and a religion. The partisans of the new ideas organized themselves as a militant sect, and under the leadership of D'Alembert, Voltaire and Diderot embarked on one of the most subtle and skillful campaigns of ideological propaganda that has ever been attempted. French was the common language of educated Europe, and wherever French was spoken, or read, in courts and camps, in salons and cafés, from Russia to Portugal, the influence of the sect made itself felt through a thousand different channels.

The great public co-operative work, which had given the movement its name, was the famous Encyclopaedia, edited by Diderot and D'Alembert with the support of the leading French scientists and men of letters, which was published in the midst of many obstacles during the fifteen years from 1750–1765. In

spite of all its defects and inadequacies, it was a brilliant success which set its mark on the epoch. It provided the educated world with a *summa* of the new learning—a detailed survey of the whole realm of science and technology and culture, such as had never existed hitherto. Not least important were the sections devoted to technology and industry, which were the work of Diderot, and the excellent series of plates which illustrated them, for they show how men of letters were now fully aware of the coming of the age of the machine and the place of the factory and the workshop in Western culture.

Thus before the industrial revolution had begun, the new philosophy was already preparing the way for its triumph. Science and industry were the two wings of the army of progress which were to be co-ordinated and united by a reformed system of rational education.

Man was born to understand and enjoy Nature, but he was unable to do so as long as his natural instincts were thwarted and his intelligence was twisted and perverted by the unnatural system of education inflicted on him during the most susceptible years of his life. Therefore the first and most essential step in the liberation of humanity is to free the immature mind from the tyranny of priests and pedants. But it was impossible to take this step until the power of the Church, the teaching orders and the universities, had been broken. This was a gigantic task which the philosophers could never have accomplished by their unaided strength. But the old order was divided against itself—the lawyers against the clergy, and the Gallicans against the Ultramontanes, and the Jansenists against the Jesuits—so that the philosophers were able to use their very considerable influence in high places to exploit these internecine feuds. Thus it came about that the Society of Jesus, the greatest of the teaching

orders and the chief organ of Catholic culture for two centuries, fell a victim to the intrigues of obscure factions and to the propaganda of the rationalist minority.

Since they had controlled the majority of colleges and secondary schools, not only in France but throughout Catholic Europe, their fall left the whole educational system disorganized and defenceless. But the philosophers were not ready to take advantage of their opportunity. As we see from their correspondence and from D'Alembert's pamphlet "*Sur la destruction des Jésuites en France*," they were taken aback by the suddenness and completeness of their victory. It is true that a number of proposals for reform were put forward, notably by Caradeuc de la Chalotais, one of the leaders of the anti-Jesuit campaign, who advocated a civic and secular system of modern languages and modern scientific studies. Even more significant was the comprehensive plan for a new university composed by Diderot for the Empress Catherine, since this provides the most complete example of the Encyclopaedists' ideal of an advanced scientific education, based on mathematics and including technology as well as physics, biology and chemistry. But little or nothing was done owing to the weakness and apathy of the government. However, throughout the twenty-five years that intervened between the fall of the Jesuits and the French Revolution, the influence of the new ideas continued to spread and the old educational traditions, both of the medieval universities and of the humanist colleges, became more and more discredited.

And so when the revolution came, the old educational institutions found no defenders. The twenty-two universities of France, including the University of Paris, the most famous of all the universities of Europe, fell without a struggle. Their privileges were abolished, their endowments were confiscated,

and finally by the law of September, 1793, they were totally suppressed, together with the colleges and most of the surviving secondary schools.¹ Never, not even at the Reformation or the Russian Revolution, was there such a wholesale slaughter of educational institutions. Thus every obstacle was removed which could stand in the way of a complete reorganization of the whole system of national education. Nevertheless the positive achievements of the French Revolution in the sphere of education were small.

Programmes it produced in plenty: the educational programme of Talleyrand in 1791, that of Condorcet in 1792, that sponsored by Robespierre in 1793 and that of Daunou in 1795. All of these programmes are interesting; some, like that of Condorcet, because they anticipate the most advanced ideals for democratic education, others, like the Jacobin programme of 1793, because they foreshadow the worst extravagances of educational totalitarianism; but all of them remained paper schemes, so that by the time Bonaparte attained power France had been without any working system of education for ten years. As Chaptal said when he assumed control, it was a lost generation. One positive achievement, however, can be credited to the Revolution on the technological level; the establishment of the famous Ecole Polytechnique, which was planned by the Committee of Public Safety as a central school of engineering and public works together with the Conservatoire des Arts et Métiers, both of which were to be the pattern for similar institutions throughout the civilized world.

But in spite of these exceptions, it was the task of Bonaparte to rebuild the whole system of national education from its

¹ The only public educational institution which survived was the Collège de France, which still occupies its original site in the Rue des Ecoles.

foundations, and he set about the work in a typically Napoleonic fashion. No one was more conscious of the importance of education for the empire, but his conception of education was a sociological and political one. "Of all political questions," he wrote in 1805, "education is perhaps the most important." "If the child is not taught from infancy to be a republican or a monarchist, a Catholic or a free thinker, and so on, the state will never make a nation. It will rest on shifting and insecure foundations, constantly exposed to disorder and change." "The essential thing is a teaching body, organized on fixed principles like the Jesuits in the past."

But while he had no objection to allowing religious orders like the Brothers of the Christian Schools to establish elementary schools for the lower classes, he had no intention of allowing the Church to recover its old influence on the educational system. On the contrary he was determined to bring the whole system under the direct control of the state, and to make the teaching profession a branch of the civil service. In order to realize this ideal he decreed in 1806 "that there shall be established under the name of the Imperial University, a body exclusively charged with the duty of teaching and public instruction throughout the Empire." This was, of course, not a university in the old sense of the word, since it covered the whole field of education and the whole territory of the Empire. It was a hierarchical authoritarian organization which possessed a complete educational monopoly, for after 1808 it became illegal to establish any school or any establishment of education whatsoever outside the Imperial University and without the authorization of its head, the Grand Master.

Thus by one stroke the new state acquired a total centralized control over education which the Church itself had never

possessed in the days when its power was most unchallenged. And though this educational totalitarianism was utterly opposed to the liberal idealism of Talleyrand and Condorcet, it none the less represented the logical conclusion of the Jacobin principle of the civic function of education and of the Encyclopaedist ideal of a unified, rationalized system of national education under secular control. Actually the scheme was too grandiose and the time was too short for it to be fully realized in practice, and private education continued to exist and even to flourish in a modest way. Nevertheless the Napoleonic university marks an epoch in the history of Western education. It stands on the threshold of the new age—an impressive monument to the new power that aspired to control the intellectual life of society and to stamp its mark indelibly on the mind of the individual in the years when it was the most impressionable.

V. NATIONALISM AND THE EDUCATION OF THE PEOPLE

While the Enlightenment and the Revolution were proceeding triumphantly

To ruin the great work of Time
And cast the kingdoms old
Into another mould

the humbler work of popular education was following an almost independent line of development. As Voltaire wrote, "We have never claimed to enlighten shoemakers and servant girls, they are the portion of the apostles." And in fact, until far on into the nineteenth century the education of the common people was left to the Church or to private religious initiative, since the far-reaching programmes for universal education launched by the French Revolution remained almost entirely without practical effect. Both the Catholic and the Protestant churches had always maintained the principle of the parish school, but this seldom amounted to more than elementary catechetical instruction. In the later seventeenth and early eighteenth centuries, however, both Catholics and Protestants became increasingly aware of their educational responsibilities. In France, St. John Baptist de la Salle founded the institute of the Brothers of the Christian Schools, and in Germany, the