The Centenary of Napoleon.

By ENG.-COMDR. EDGAR C. SMITH, O.B.E., R.N.

THE death of Napoleon occurred one hundred years ago to-day, and the celebration of his centenary now taking place in France will doubtless include some recognition of the encouragement and patronage given by Napoleon to scientific discovery and mechanical invention. Many rulers have availed themselves of the services of mathematicians at their courts, and not a few learned societies owe their existence to the support of kings and princes. An Academy of Sciences at St. Petersburg was the dream of Peter the Great; the golden era of the Prussian Academy was the reign of Frederick the Great. Napoleon, as keen in his appreciation of the value of science as either Peter or Frederick, had not, like them, to seek abroad for men of talent. More than fortunate in this respect, his accession to power coincided with the rise of such institutions as the *Ecole Polytechnique*, the *Ecole Normale*, and the *Institut de France*, and he found among his contemporaries astronomers, physicists, chemists, and naturalists of the highest rank. Distinguished at school for his mathematical ability, he became a member of the Institute, attended altogether thirty-eight of its sittings, rearranged the various classes, and designed the uniform of its members. It was he who housed the Institute in the *Palais des Quatre Nations*. During the Egyptian campaign he was wont to sign his proclamations "Member of the Institute, General-in-Chief of the Army of the East."

Among the favourite associates of Napoleon at this time were the savants Monge and Berthollet. It was Monge who carried the Treaty of Campo Formio back to France, and he and Berthollet were among the spoilers detailed to rob the Italian museums and galleries. During the winter of 1797-98 Napoleon attended Berthollet's lectures on chemistry, and it was probably Berthollet's suggestion that a body of savants should accompany the Egyptian expedition. When the fleet left Toulon in May, 1798, besides his generals and secretaries, Napoleon had in his suite two astronomers, four geometers, a geologist, a chemist, three naturalists, and six civil engineers. On the voyage, tired of discussions on religion, government, and strategy, he would raise such questions as whether the planets were inhabited; how old was the earth; would the earth be destroyed by fire or water?

Upon arriving in Egypt Napoleon at once set his corps of savants to work. Undaunted by the destruction of the French fleet by Nelson on August 1, 1798, three weeks later, at Cairo, he inaugurated, with considerable ceremony, the short-lived Institute of Egypt. Monge was president, Fourier, the mathematician, secretary, and Napoleon vice-president. The members were employed on geodetic operations, astronomical work, the study of the Nile, the improvement of crops, and the manufacture of munitions. When the victories of Desaix threw open the middle reaches of the

Nile, the artists and engineers of the Western world gazed for the first time upon the wonders of Memphis. Many of the portable relics transferred first to Cairo and then to Alexandria now rest in the British Museum. Our possession of the Rosetta stone dates from about this time. The story of the geologist Dolomieu rightly belongs to the Egyptian campaign. Having suffered the hardships of war, he sailed for home, only to be shipwrecked, and then imprisoned by the King of Naples. Bearing his confinement with philosophic resignation, he continued to write his memoirs on the margins of books. Sir Joseph Banks was foremost among those who tried to secure his release, but it was Napoleon's insertion of a special clause in the treaty after Marengo that gained Dolomieu his liberty.

During the Consulate and Empire Napoleon gave many proofs of his interest in the progress of science, but no discovery raised his enthusiasm higher than did Volta's. The invention of the pile had been made known by Volta's letters to Banks. No sooner did Napoleon hear of it than he called the famous physicist to Paris, attended a special sitting of the Institute, and caused a gold medal to be struck bearing the inscription "A Volta, séance du 11. Frimaire, An IX." He afterwards made Volta a senator and a count, gave him a sum of money, and presented him with a sword of honour. The sword and a picture of Volta explaining his battery to Napoleon were among the relics saved from the disastrous fire at the Volta Centenary Exhibition at Como in 1899. The First Consul further showed his interest by founding a prize of 3000 francs "for the best experiment which shall be made in the course of each year on the galvanic fluid." The acceptance of this prize by Davy in 1808 for his discovery of sodium and potassium roused a good deal of feeling in this country, some folk going so far as to consider Davy almost a traitor. Much the same experience had befallen Banks, when, with Sir W. Herschel, Cavendish, Maskelyne, and Priestley, he had been elected one of the first foreign associates of the Institute.

Another scientific investigator who gained the ear of Napoleon was Chladni, the founder of the science of acoustics. Chladni, who had spent some years travelling and lecturing, arrived in Paris in 1808. The Emperor, struck with the importance of his discoveries, called for a report from his French savants, and afterwards gave 6000 francs for the translation of Chladni's treatise. Whether it was in the domain of astronomy, of chemistry, or of physiology, Napoleon seldom failed to show his respect for work of more than usual merit. His interest in the anatomical models of Fontana, in the mathematical work of Mascheroni, and in the discoveries of Spallanzani, and his encouragement of researches on indigo and beetroot, are a few instances which

illustrate this point. To them might be added his admiration for Jenner. It was Napoleon who placed a memorial in one of the wards of the Hôtel-Dieu to the memory of Dessault and Bichat.

Industrial progress and efficiency no less than scientific discovery appealed to Napoleon. Jacquard's loom of 1801 at first brought little but opposition and trouble to the inventor, the Industrial Council of Lyons even passing a formal condemnation of the loom. His ingenuity being remarked by Carnot and then by Napoleon, Jacquard was for a time employed in the Conservatoire des Arts et Métiers, and by a decree dated at Berlin, October 27, 1806, Napoleon gave him a pension of 6000 francs and a premium of 50 francs for each loom erected. In 1810 the Emperor offered a reward of a million francs to the inventor who should first bring into successful operation a method of spinning flax by machinery. The problem was solved by the distinguished mechanic and practical chemist Philippe de Girard, to whom France was indebted for successful work in various directions. Girard, however, died in 1845 without receiving the reward, though his descendants were recompensed.

The great public works initiated by Napoleon were as remarkable as his educational schemes. For the improvement of harbours and rivers, and for the construction of bridges, canals, and roads, he found in the Corps des Ponts et Chaussées, established in 1747, a body of technically trained public servants such as no other country in the world then possessed. The canals connected with the Rhine and Rhône, the Saône, the Seine, the Ourcq, and the Oise; the works at Dunkirk, Havre, Dieppe, Honfleur, and Brest; and the breakwater at Cherbourg, were all carried out by this famous corps, the records of which are enriched with the names of Perronet, Girard, Gauthey, Navier, and Prony. At Malmaison one day Napoleon said to Chaptal: "I intend to make Paris the most beautiful capital in the world. . . . What are your plans for giving water to Paris?" Chaptal gave the alternatives—artesian wells or bringing the water from the River Ourcq. "I adopt the latter plan; go home and order five hundred men to set to work to-morrow at La Villette to dig the canal." "Such," says Dr. Holland Rose, "was the inception of a great public work which cost more than half a million sterling."

The many men of science upon whom Napoleon

bestowed honours were scarcely more numerous than those he employed in positions of trust. The story of Laplace as Minister of the Interior is well known. Given the post at his own request, six weeks later he was removed because he carried into the art of government the principles of the infinitesimal calculus. Sixteen years before this Laplace had been young Bonaparte's examiner at his entrance into the army. Guyton de Morveau, Cuvier, Fourcroy, Chaptal, and Lacépède were among those who held public offices. Lacépède was for some time President of the Senate. With Laplace he was not unlike the Vicar of Bray, and found no difficulty in agreeing with any Government—revolutionary, republican, monarchical, or imperial. It may be it was of him Napoleon was thinking when one day he bitterly remarked: "Men deserve the contempt with which they inspire me. I have only to put some gold lace on the coat of my virtuous republicans and they immediately become just what I wish them."

Of a different stamp were Cuvier and Chaptal. Cuvier, whose reputation as a naturalist and organising ability as secretary to the Institute could not fail to attract Napoleon's attention, was appointed one of the six inspectors to establish lycées in the principal towns. He afterwards did valuable work in the reorganisation of some of the European universities. Among all the public men Napoleon drew from the world of science, however, none stood higher in general esteem than Chaptal. Released from prison during the Revolution to superintend the manufacture of gunpowder, the rise of Napoleon opened for him a career of great public usefulness. Succeeding Lucien Bonaparte as Minister of the Interior, he founded trade schools, encouraged arts and manufactures, and assisted the Chambers of Commerce. Though his loyalty to Napoleon led to his being deprived of his peerage at the Restoration, he continued to devote his vast knowledge and great talents to the service of France, showing always that consistency, moderation, and desire for the common good for which he had been conspicuous under the *régime* of Napoleon.

"The true conquests, the only conquests which cost no regrets, are those achieved over ignorance," Napoleon once said. Such are the conquests of science, and no results of Napoleon's life's work are more enduring or beneficent than those due to his encouragement of scientific education and scientific discovery and to his promotion of great public works.

The Annular Eclipse of April 8.

By MAJOR W. J. S. LOCKYER.

THE best positions to observe the annular eclipse of the sun on April 8 were to the extreme north-west of Scotland, and it was the intention of Lt.-Col. F. K. McClean and myself to take up a station somewhere in that part. Owing to the miners' stoppage Col. McClean was

unable to take the journey, but in London I succeeded in finding two volunteers in Mr. Patrick Alexander and Mr. Allan Young, and we started off for Durness (Sutherland), near the entrance to Loch Eriboll, on the evening of April 5. Reaching Lairg the following afternoon,

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