and his salt is such a vague entity that it can scarcely be said to have any value in chemical theory. Still, some link may be traced between this *tria prima* and the three 'earths' of Becher, which led in turn to the phlogiston theory, an important phase in the development of theoretical chemistry.

In calling to memory the death of Paracelsus at Salzburg on September 24, 1541, we can point to little which is definite in his scientific contributions, but his insistence that Nature has little regard for theoretical systems or cherished traditions is essentially scientific and certainly played a part in the progress which was to lead to the "Sceptical Chymist" of Robert Boyle, a work in which Paracelsus is respectfully quoted and criticized. It seems that much of the fame of Paracelsus (like much of the discredit which is attached to his name) rests on popular estimates, and his contributions are not nearly so important as those of men whose names are practically unknown. It is probably certain that but for his emphatic lead the advances in chemistry which followed him so closely would have been deferred, and he well deserves a place in the annals of science quite apart from his contributions to medicine.

P. S. PALLAS (1741-1811)

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

ON September 22 occurs the bicentenary of the birth of Peter Simon Pallas, one of the greatest naturalists and scientific explorers of the eighteenth century. Though German by birth, he passed forty-two years in the service of the Russian Government, and the most fruitful part of his life was the six arduous years, 1768–1774, which he spent exploring the eastern parts of European Russia and the plains and mountains of Siberia.

The son of a surgeon, Simon Pallas (1694–1770), he was born in Berlin, and after studying at Halle and Göttingen graduated in medicine at Leyden. He then spent about a year in England examining and studying zoological collections and afterwards at The Hague published his first work on zoology. It was, however, not long before a more active career opened before him. In 1768, at the age of twenty-seven, he accepted the invitation of the Empress Catherine II to occupy a chair of natural history in the Imperial Academy of Sciences, St. Petersburg, and this led almost immediately to his appointment to an expedition being sent out, first to observe the Transit of Venus of 1769, and secondly to gather information about the peoples, plants, animals, climate and geography of the vast dominion of Siberia and of other little-known parts of the Russian Empire.

Scientific expeditions by land and sea under official auspices were a feature of the eighteenth century, and most of these expeditions were fostered by the Royal Society of London, the Paris Academy of Sciences and similar bodies. Among such expeditions was that made during 1733–1743 by Behring, J. G. Gmelin, G. F. Muller, S. Krascheninnikof and others for the Russian Government; this added immensely to the knowledge of northern Asia from the Urals to Kamchatka. Two years after this expedition set out the Paris Academy of Sciences sent Bouguer, Godin and La Condamine to Peru to determine the figure of the earth, while others were sent to Lapland. The Transit of Venus of 1761 saw other expeditions. One of these was carried out for the Paris Academy of Sciences by the Abbé Jean Chappe D'Auteroche (1722–69), who observed the transit at Tobolsk, the capital of Siberia. When this astronomer published an account of his travels he made some remarks about the state of Russia which led Catherine, who had literary leanings, to reply in a brochure entitled "Antidote contre le voyage de l'abbé Chappe".

As the 1769 Transit of Venus approached, Catherine determined to arrange expeditions second to none, and the Imperial Academy of Sciences, most of whose leading members were foreigners, was asked to draw up full instructions. Altogether seven astronomers and five naturalists with several assistants were attracted by Catherine's offers. The Swiss astronomers, J. A. Mallet (1740–90) and J. L. Pictet (1739–81), were sent to Lapland; the German scientific worker, W. L. Kraft (1743–1814), to Orenburg; the Russian mathematician and geographer, S. Rumoffski (1734–1815), to the Pola peninsula; and G. M. Lowitz (1722–74) to the Volga district. To the south-west of Russia were also sent the naturalists, S. G. Gmelin (1743–74), nephew of J. G. Gmelin, and J. A. Guldenstaedt (1745–80). Pallas himself left St. Petersburg in June 1768, spending the summer in the Russian plains and wintering at Simbersk on the Volga. He next visited Tartary, examined the shores of the Caspian, and in 1770 crossed the Urals to Catherinenburg. Having examined the mines in the district he went to Tobolsk and in 1771 visited the Altai mountains. Proceeding north, he reached Krasnojarsk, on the Yenisei, and then turned back to the frontiers of China and so in 1773 to Astrakhan, where he met Gmelin. After visiting the Caucasus, he reached St. Petersburg again in July 1774. Lowitz and Gmelin were not so fortunate, for in that year the former was murdered by rebels and the latter died through illness and imprisonment while still carrying out exploration on the shores of the Caspian.

Partly during the expedition and partly afterwards Pallas published in German his "Voyages in Different Parts of the Russian Empire, 1768–75". "Few explorers", said von Zittel, "have contributed such a vast wealth of geographical, geological, botanical, zoological and ethnological observations as Pallas has done in this justly famous work." Another result of his travels was his book on the formation of mountains, his views on this subject giving him a place beside de Saussure as one of the founders of geology.

In 1793, Pallas commenced a journey of two years duration in southern Russia and the Crimea, and liking the district well, in 1795 he settled there on an estate given him by the Empress not long before she died. Here at Simferopol he passed fifteen years, continuing his studies in natural history. In 1810, after the death of his wife, he obtained permission from Alexander I, whose tutor in science he had been, to return home, and he died at Berlin on September 8, 1811, within a few days of his seventieth birthday. Of all the many eminent men of science, such as Delisle, Euler, the Gmelins, Daniel Bernoulli, Lexell, Æpinus, Lehmann, Nicolas Fuss and John Robison, whom succeeding Russian rulers attracted to St. Petersburg, none did greater service for their adopted country than Pallas.

POULTRY AS FOOD CONVERTERS

BY E. T. HALNAN,
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THE value of the egg as a constituent of war-time dietaries, particularly for children, has to some extent been overshadowed by the insistence placed on milk as a perfect food. In point of fact, milk is not a complete food, being deficient in iron and relatively low in vitamin D, although rich in calcium salts. Eggs, on the other hand, have a poor calcium content, but are rich sources both of vitamin D and iron.

Both products are of high biological value, and are in a sense complementary to one another, mixtures of these two forming a perfect diet for young growing animals. Thus De Sanctis[1] reports the case of a three-months-old infant failing to gain weight on a whole-milk dextrimaltose formula, but responding and giving 8–12 oz. gains weekly when one teaspoon of soft-boiled egg yolk was added daily. Tweddell[2] similarly got satisfactory responses in two infants aged eight and nine months respectively by the inclusion of one raw egg daily in their milk diet. Hess[3], in efforts to combat rickets in babies, used egg yolk with marked effect, and recommends the inclusion of the yolk of a raw egg daily in the milk formula of a three-months-old infant as good routine practice.

The essential point to note in these cases is the failure of milk to prove adequate in the diets of some infants, and the power of egg yolk to correct its inadequacy. Moreover, both eggs and chicken meat are easily digested and readily tolerated by those with weak digestions, consequently they form essential articles in the diets of those recovering from illness. In addition, the hæmoglobin-forming power of eggs in cases of war-wounded patients suffering from loss of blood should not be overlooked.

On dietetic grounds therefore, the maintenance of an adequate egg supply appears to be just as vital to the health of the nation as the maintenance of an adequate milk supply. If, however, the home food production policy of the Government is considered, it would appear that this fact has not hitherto received the consideration that it merits. The shortage of animal feeding-stuffs, particularly concentrates, led the Government shortly after the outbreak of war to assign an order of priority to various classes of farm livestock for such feeding-stuffs as were available. Several factors appear to have influenced the final decision, among which may be named the relative efficiencies of the various classes of livestock as converters of animal feeding-stuffs to human food, the need for maintenance of land fertility, the fact that the foods normally fed to pigs and poultry largely consisted of materials available for direct human use, and the fact that the Scandinavian and the Low Countries were then available as sources of supply for eggs and pig products. As the result of these and