expedition reached the mouth of the river, but much of the equipment and many supplies were lost. Orton, with a few companions, made the 600-mile journey back to La Paz through the forest and jungle amid incredible hardships. He died on crossing Lake Titicaca.

VACCINATION FOR SMALLPOX IN ENGLAND

THE London *Times* reports that at Nottingham, an epidemic of considerable proportions is now established; there have been 46 cases, 36 being unvaccinated, since the beginning of February. Last year a somewhat serious outbreak took place in Glasgow.

It is said that many towns in the country are badly protected at present for the doctrines of the opponents of vaccination have been widely spread. Of some areas it would be fair to say that they are destitute of protection. The population has simply refused vaccination *en masse*. An illustration—which is by no means exceptional—is Coventry, where the medical officer of health has issued the following figures:

Year	Births	Vaccinated, Percentage
1916	2,996	22.9
1917	2,738	13.0
1918	2,857	10.7
1919	2,429	8.7
1920	3,372	9.6

It was deliberate, as the following list makes quite clear:

Year	Declarations made of conscientious objections
1916	1,946
1917	1,830
1918	1,763
1919	1,250
1920	2,303

The medical officer points out that "this community is becoming largely an unvaccinated one."

What this may mean can be guessed from a series of figures published by the City of Liverpool in which the ravages of smallpox during the past 51 years are set down. The following are extracts:

Year	Deaths	Year	Deaths
1870	174	1883	26
1871	1,919	1884	106
1872	50	1885	46
1873	10	1886	29
1874	30	1887	1
1875	29	1888	1
1876	386	1889	1
1877	299	1890	None
1878	3	1891	2
1879	None	1892	13
1880	2	1893	9
1881	34	1894	20
1882	6	1895	12

The figures have remained very low since then except for the sharp epidemic of 1903 when there were 141 deaths. In 1918 there were only seven cases in England and Wales. But the sharp drop in vaccination of the past two years may be followed by a severe penalty.

THE WORK OF THE ROYAL OBSERVATORY AT THE CAPE OF GOOD HOPE

S. S. CLOUGH, H. M. astronomer at the Cape of Good Hope, has recently issued a report in which he gives an account of the distribution of the normal work of the observatory.

Dr. Halm exercises general supervision in all departments and takes part in heliometer observations and observations of an extra-routine character requiring special attention. He acts in full charge of the observatory during the absence of H. M. astronomer. Dr. Lunt is in charge of the Victoria telescope and its instrumental accessories, and of all photographic work in connection therewith.

Mr. Cox is in charge of the new meridian circle and of the time signal service, and supervises the reductions of all meridian observations. Mr. Woodgate is in charge of the astrographic telescope, photo-heliograph and seismograph, and of all photographic work connected therewith, and supervises the department of miscellaneous computations.

In addition to the above, a staff of fourteen computers and assistants is employed.

There are also attached to the observatory an instrument maker, an electric fitter, a stoker, a carpenter, and three Kroomen, who

act as messengers and keep the rooms and grounds in order.

Messrs. A. W. Long and J. F. Skjellerup, two voluntary observers, have undertaken a program of observations of variable stars, and an equatorial (either the 6-inch or the 7-inch) has been placed at their disposal as required for this purpose. The regular meridian observers during the year have been Messrs. Cheeseman, Wilkin, Peirce, Mullis, Duncan and Davis. The heliometer observations have been made by Messrs. Hough and Halm. The observations with the Victoria telescope have been made by Messrs. Lunt, Jackson and Baines, those with the astrographic telescope by Mr. Woodgate. Occasional observations of occultations, etc., have also been made by Messrs. Cox, Power and Pead.

THE INTERNATIONAL COMMISSION ON ILLUMINATION

THE first technical session of the International Commission on Illumination, the successor of the International Photometric Commission, was held in Paris on July 4–8. According to the report of the meeting in *Nature* those interested in illumination problems in Belgium, France, Great Britain, Italy, Spain, Switzerland and the United States of America were represented at the session, which was opened by the Minister of Public Works, who welcomed the delegates in the name of the French Republic. The British delegates, nominated by the National Illumination Committee of Great Britain, were: Major K. Edgcumbe (Institution of Electrical Engineers, chairman of the National Committee), Mr. C. C. Paterson (hon. secretary and treasurer of the International Commission), Mr. A. P. Trotter (Illuminating Engineering Society), Dr. E. H. Rayner (National Physical Laboratory), Mr. L. Gaster (Illuminating Engineering Society), Mr. R. Watson (Institution of Gas Engineers), and Mr. J. W. T. Walsh (National Physical Laboratory, assistant secretary of the International Commission). The subjects dealt with by the commission were as follows: (1) The unit of candle-power at present in use in this country and in France and the United States was adopted for international purposes, and is to be known as the "international candle." It is maintained by means of electric incandescent lamps at the National Laboratories of the three countries named. (2) The definitions of the terms "luminous flux," "luminous intensity," and "illumination," and the units of these quantities, viz. the lumen, the candle, and the lux (meter-candle), were agreed upon. (3) The subjects of heterochromatic photometry (including physical photometry and the characteristics of the "normal eye"), factory lighting, and automobile head-lighting were also discussed at the meetings, and sub-committees were appointed to study the questions from the international point of view during the next three years. The new president of the commission is Dr. E. P. Hyde, director of the Nela Research Laboratories of America, and Major Edgcumbe is one of the three vice-presidents. The next meeting of the commission was provisionally arranged to be held in New York in 1924.

CHEMISTRY AND CIVILIZATION

THE American Chemical Society, meeting this week in New York City, held on September 8 a session devoted to "Chemistry and Civilization." According to the announcement Dr. Edgar F. Smith, provost emeritus, University of Pennsylvania, would be in the chair, and the speakers were:

The rôle of chemistry, Dr. CHAS. BASKERVILLE, director of the Laboratories, College of the City of New York; chairman of the International Committee.

Energy; its sources and future possibilities, Dr. ARTHUR D. LITTLE, chemical engineer and technologist, Boston.

The engineer; human and superior direction of power, Dr. LEO H. BAEKELAND, honorary professor of chemical engineering, Columbia University.

Chemistry and life, SIR WILLIAM J. POPE, professor of chemistry, Cambridge University.

Theories, Dr. WILLIS R. WHITNEY, head of research department, General Electric Company.

Research applied to the world's work, Dr. C. E.