

regarding blood groups are given, together with nearly 500 references to the literature. Part 1 is general, its nine sections including tabular treatment of the chemical and serological nature of the agglutinogens *A*, *B*, *M* and *N*; relations to other species; subgroups; heredity of the types; medico-legal applications; relation to disease; and blood groups in animals. Part 2 is anthropological, giving maps of the world distribution of the *A* and *B* and complete tables of the frequency of *A* and *B* as well as *M* and *N* in the various ethnic stocks tested in all parts of the world up to the time of publication. By the use of two kinds of type an attempt is made to distinguish between the more reliable results and those which, because of small numbers (less than 200) or for other reasons, are regarded as less reliable. This compilation of the serological and anthropological facts regarding the blood groups will be of much service to all workers who are interested in this subject.

#### Position of the Illegitimate Child

THE League of Nations has just published a "Study on the Legal Position of the Illegitimate Child" (London: George Allen and Unwin, Ltd., 1939. 4s.). The study opens with a short historical survey of the social aspects of the legislation on the subject in various countries, followed by an analysis of the various legislative provisions respecting civil status, name, nationality and legal domicile, and inheritance rights. The fate of the illegitimate child being closely bound up with that of its mother, a chapter on the unmarried mother's rights is included. The last part of the volume deals with social insurance laws, and welfare measures, including public assistance and preventive health measures.

#### Television Broadcasting

SIR NOEL ASHBIDGE gives a review of the progress being made in broadcasting and television in the *Proceedings* of the Wireless Section of the Institution of Electrical Engineers of June. The period under review extends from the end of 1934 until the end of 1938. During this period the number of licence-holders in European countries has increased by more than 60 per cent. The details of the Royal tour in America in increasing the popularity of sound broadcasting have not yet been published, but it is known that the excellent broadcasts of sound and television have greatly increased the popularity of the British Broadcasting Company. The second part of Sir Noel's report deals exclusively with television broadcasting. The great improvements made in the quality of the pictures shown, the great trouble taken by the Government Post Office to locate the position and find out the cause of the interference, when complaints are made, and the remedies they suggest, in many cases completely eliminating the trouble, have satisfied the users in nearly every district. The nominal hours of transmission are now from 3 to 4 p.m.; and from 9 to 10 p.m. The vision transmitter and the studio and control room equipment at the Alexandra Palace Station have been

considerably improved; in particular, an improved type of 'Emitron' tube, known as the long-gun type, is now in use for studio work. It is now possible to obtain very satisfactory results with telephoto lenses. Satisfactory reception is possible up to a radius of about thirty miles from the Palace. In exceptional cases reception has been reported up to 200 miles. It is hoped that in the future international standardization with regard to definition and picture frequency may become available, as the absence of a common standard would be a most serious drawback.

#### A Factory without Windows

A DESCRIPTION is given in the *Electrical Review* of August 4 of a factory without any windows which is being constructed for the Simonds Saw and Steel Co. at Fitchburg, Mass., U.S.A. It is completely air-conditioned and artificially illuminated throughout. It concentrates productive machinery now covering 17½ acres in several plants, into 5½ acres of production space, from which daylight is completely excluded. Lighting fixtures are being installed in 1,440 positions. Each consists of a 100-watt lamp and a simple curved porcelain reflector. These produce an illumination of not less than 20 ft-candles throughout each room on the working plane. The Company plans to operate the new plant intensively on a three-shift basis, so that the work goes on continuously day and night. Service mains for water, gas, steam, power, light, air and oil are laid between the floors through ducts direct to more than 1,000 machines and furnace positions. The plant has a connected power load of 6,000 horsepower and a total of 4,200 electric outlets giving current for light, machine power, transformers, motor-generators and other units. Dust and exhaust gases are removed through underground ducts, served by thirty dust-removal units. The entire building is air-conditioned by Carrier units and the humidity and temperature controlled through hydrostats and thermostats at four special positions. 'Man-cooler' systems have been provided for the comfort of men working at the furnaces. Air will be circulated through the building at the rate of about 400,000 cub. ft. per minute. It enters the structure through louvres on the end walls of four lean-to buildings which adjoin the main building. Water is obtained from four artesian wells by electric pumping. Air is blown through water-sprays in each of these structures before being distributed.

#### The All-Welded Hull of H.M.S. *Seagull*

H.M.S. *Seagull* is one of the two minesweepers ordered to be built at Devonport Dockyard as part of the 1936 Naval programme. It was decided that *Seagull* should be built all-welded, whilst the sister ship *Leda* should be constructed in accordance with the normal practice, that is, mainly riveted. The occasion was to be utilized by obtaining a trustworthy comparison between the two methods of construction. So far as was practicable, the thicknesses of plating were left unaltered. The *Seagull* was launched on October 28, 1937, the launching weight

was 313 tons, and the weight of the *Leda* was 338 tons. The welded vessel was commissioned and completed in 1938. Both ships underwent rough-weather trials in Faroe-Icelandic waters for about a fortnight in September 1938.

A PAPER read by A. Nicholls on the *Seagull* to the Institution of Naval Architects on March 31, 1939, and abstracted in *Electric Welding* of June, gives the conclusions to be deduced from the relative costs of building the two ships and their behaviour when on active service. In the discussion on the paper, the Captain of the *Seagull*, who was present, said that he had found the vessel perfectly satisfactory in all respects, although he admitted that he had his doubts when he heard that he had been drafted to an all-welded ship. He had taken her to the region of Iceland for her trials in order to give the vessel a severe test in rough weather, and he testified to the almost complete absence of creaks and groans. He had found that at the same revolutions per min. his vessel was faster than any other in the flotilla, due, he thought, to the saving in weight, and he found that her fuel consumption was considerably less than the *Leda* and the other vessels of the flotilla. On the *Seagull*, which was a minesweeper, there was very little vibration from the winch aft, when drawing in the cables. The author concluded that there are no insuperable difficulties in the way of fabricating a ship's structure entirely by welding and that the redistribution of labour entailed by the new technique does not involve additional expense nor increase the time of building.

#### New York and London Roads

It is stated in *Roads and Road Construction* of July that municipal engineers were greatly impressed by the highways followed during the Royal tour in the environments of New York. In particular the West Side Express Highway, the Triborough Bridge, the Henry Hudson Parkway and the Great Central Parkway can be described as magnificent highways. They form part of the system which has been built up during the past ten years near New York. Some of the engineers have returned with plans for bringing certain old-fashioned highways of Great Britain up to date. In New York City and Long Island alone there are more than a hundred miles of parkway and nearly two hundred fly-over crossings. Traffic using these routes is able to reach the heart of Manhattan without a single hold up such as those which delay motorists many times on most routes into big cities of Great Britain. The question is discussed why New York and in a lesser degree Paris, Rome and Berlin have been able to achieve what London has only been able to do in a very minor degree. It is suggested that there are two factors, the first connected with organization and the second with a happy choice of opportunities and times for road building. The development of parkways in the vicinity of New York was conceived and promoted by an independent organization known as the Long Island State Park Commission. This Commission has pursued a continuous policy, and has overcome

difficulties in a way impossible to a well-meaning local authority. The opportunity presented by the economic crisis of 1929 and the vast sums afterwards distributed by the Federal Government for the relief of distress and unemployment was taken full advantage of with very happy results. The result has been that New York has now an unrivalled arterial road system. It is hoped that a similar coincidence, namely a strong independent planning authority aided by the central government could, and perhaps one day will, do the same for London.

#### A 'Hot' Lightning Flash

A RECENT report issued by Science Service, of Washington, D.C., states that the Westinghouse Company has perfected a method, first discovered by P. L. Bellaschi, for producing an artificial electric discharge which imitates natural lightning in its ability to set fire to materials in its path. This form of discharge, which is called 'hot' lightning, is used for the routine testing of all high-tension power transformers sent out by the Company. The volt-amperes required for the test are  $1\frac{1}{2}$  million volts, 80,000 amperes. In the previous method used of creating discharge flashes, the heat developed was intense and they had enormously destructive explosive effects on whatever they hit unless it was adequately protected, but they did not last long enough to set fire to combustible targets, only leaving a scorched hole. In the 'hot' lightning stroke, there is a low-amperage, long-duration stroke following the main and 'leader' lightning discharged, similar to natural lightning. The after-stroke of 'hot' lightning generates temperatures only half as high as the main stroke, but it lasts between 100 and 1,000 times as long. The long-duration charge is produced by means of additional condensers or by a transformer from which the charge is 'soaked' through a series of resistance inductance coils in oil and permitted to follow the initial high-current discharge relatively slowly. Demonstrations are shown by the Company of 'hot' lightning, fusing sand in a fibre tube, setting fire to cotton cloth and burning holes through copper sheets varying from one thirty-second to one-sixteenth of an inch in thickness.

#### Earthquakes during May 1939

ACCORDING to the Bureau central séismologique de Strasbourg, 120 earthquakes were felt by people or recorded by instruments during May 1939. Eight were registered on each of the first and last days, seven were registered on each of the sixth and fourteenth, and only one was registered on each of the seventh, fifteenth, eighteenth and twenty-ninth. The most severe shocks appear to have been those in the region of Akita, Japan, on the first, in California near  $29^{\circ}5'N.$ ,  $113^{\circ}8'W.$  on the second, in the Azores (scale 5 on the island of Santa Maria) on the eighth, in the monts d'Aubrac, France (scale 5) on the sixteenth, in the Adriatic on the twentieth, and at Kalacryta (Greece) where houses were cracked and the intensity reached 8 on the Rossi-Forel scale on the thirty-first, six in all. The last of these appears