been taking place in response to these changes as they occurred, while in the future continuous adaptation will be required. Britain has now entered a period in which planning—conscious direction and intelligent anticipation—is essential to national welfare. Industry is already striving towards that integration and unity which modern conditions demand, and these efforts must be assisted. A sufficient measure of centralisation of control is required to enable the activities of separate industries to be brought into harmony with the economic objectives essential to national welfare and prosperity as a whole. The units of productive effort need to be controlled by a co-ordinating central authority sufficiently representative and sufficiently powerful to direct capital and labour into the correct channels to maintain equilibrium. Even already, Britain has been moving into this field of conscious endeavour by the road of protection, agricultural marketing, the regulation of wheat and coal production, the centralised direction of electrical power distribution, and now by the subordination of credit to the needs of industry. Mistakes have, of course, been made in the past, but improvements will have to be carried out as experience is gained.

New Index Number of Profits

IN his valedictory address on June 21 as president of the Royal Statistical Society, Sir Josiah Stamp described a new index number of profits, which he has constructed. This consists of a general index of profits designed to show changes in the return to capital as a whole and a special sub-index showing variations in the return for risk-bearing capital (ordinary shares, etc.). Both indices are comparable with the index of production, the various price indices, and other statistics. For technical reasons, the year 1924 has been selected as the base period, but the numbers have been carried back to 1920 as shown in the following table:

Year.	General Index.	Special Index.
1920	107·0	112·0
1921	68·7	57·3
1922	90·4	84·6
1923	94·1	90·6
1924	100·0	100·0
1925	104·1	109·3
1926	98·3	103·0
1927	106·5	111·4
1928	106·2	110·7
1929	109·9 *	114·3
1930	100·9 †	94·4
1931	92·0 †	80·9 *

* Provisional, subject to early verification.
† Very provisional.

Sir Josiah Stamp pointed out that his index referred to changes in the *aggregate amount* of profits, and not to the *rate of return* on capital. Inasmuch as a large increase has taken place in invested capital since 1924, the fall in the rate of return per unit of capital is greater than that of any fall indicated by the aggregate index. The index shows that the range of boom and depression is far smaller in Great Britain than in the United States.

The Patents and Designs Bill

CONFIDENCE which was placed in the Joint Chemical Patents Committee on its formation has been fully justified by the record of its activity. This committee of the Association of British Chemical Manufacturers, on which the Chemical Society, the Institute of Chemistry, and the Institution of Chemical Engineers are represented, gave evidence before the Board of Trade Departmental Committee on the Patents and Designs Acts and the practice of the Patent Office, during the inquiry which extended over eighteen months. The Patents and Designs Bill recently introduced into Parliament proposes to give effect to the recommendations of this Departmental Committee, generally known as the Sargant Committee; on publication, the Bill was examined by the Joint Chemical Patents Committee, and was considered still to contain a number of points of importance requiring amendment. As a result of the presentation of a memorandum to the Board of Trade, followed by a deputation, almost all the desired amendments have been secured at the committee stage of the Bill. For example, more effective provision for dealing with the abuse of user patents, whereby the manufacture of non-patented substances was being restricted or entirely prevented in Great Britain, has been obtained. The section dealing with the remedy in case of groundless threats of legal proceedings has been amended, and the appeal tribunal is to have power to obtain the technical assistance of an assessor in all cases. So far as the costs of appeal are concerned, the present atmosphere of appeals to the law officer is to be preserved, although in certain respects the tribunal will be regarded as a court of the High Court. It is a valid claim that these major amendments will both strengthen the new Act and afford great assistance to the poor inventor.

Prof. H. Brereton Baker

ON the occasion of his seventieth birthday, Prof. H. Brereton Baker and Mrs. Baker were, on June 25, entertained at dinner at the Imperial College of Science and Technology by a number of colleagues and former pupils. The rector of the Imperial College, Mr. H. T. Tizard, presided, and the company included distinguished representatives of those who had been associated with Prof. Baker's work at Dulwich College, at the University of Oxford, and at the Imperial College, London. *Ave* was, however, accompanied by *Vale*, for at the end of the present academic year Prof. Baker retires from the directorship of the Chemistry Department of the Imperial College and from his chair of chemistry in the University of London; fortunately, however, Prof. Baker will continue actively to prosecute his researches, and will occupy accommodation which has been placed at his disposal for that purpose by the College. Tribute was paid to Prof. Baker's work, both for chemical science and for the institutions with which he has been associated, by Mr. Tizard, Mr. R. T. Lattey, Mr. D. L. Chapman, and Prof. H. E. Armstrong. During the evening an inscribed album was presented to Prof. Baker, and Mrs. Baker was asked to accept a piece

of jewellery; decision regarding the nature of the principal gift awaits the intimation of Prof. Baker's wishes. It is known, however, that Prof. Baker, whose interest in the establishment of the College hostel has resulted in so marked a development in the students' social life, is anxious to commemorate his association with the Imperial College by placing a clock in the quadrangle, and intends to devote the major part of the presentation fund to that purpose.

New Buildings at Rothamsted

THE annual inspection of the experimental plots and laboratories at Rothamsted on June 21 was made the occasion of the official opening of a new block of buildings at the farm and the inauguration of an extensive electrical installation in the farm buildings. The Right Hon. Sir John Gilmour, Minister of Agriculture, declared the buildings open, in the presence of a large gathering of guests representing all branches of agriculture and the allied industries, and many of the visitors came from distant parts of the Empire. The new block of buildings will serve both the field experimental and demonstration sides of the farm. It contains an artificial manure store, working and office accommodation for the field experimental staff, and equipment to deal with the drying and preparation of the numerous samples taken in the course of the modern experiments. The purpose of the demonstration room is to facilitate the presentation of the field results which have direct practical interest in a way which is easily grasped by visitors. Diagrams and models take the place of tables of figures. Good types of machinery are illustrated, successful rations fed on the farm are on record, and exhibits of plant disease are set up as they become available. The electrical installation, designed by the General Electric Company, Ltd., will be of the most modern and complete kind, and will provide very valuable information as to the cost and general efficiency of motor-driven farm machinery in comparison with the older oil-driven type. The many visitors to Rothamsted are always interested in the excellent collection of modern implements loaned or presented by the makers. The installation of electrical equipment will greatly add to the demonstration value of this side of the farm.

Southern Railway Electrification

APPRECIABLE progress is being made on the Southern Railway's London-Brighton electrification scheme. According to the *Electrician* of June 24, 'streamlined' electric trains have been undergoing night time tests. The first half of the new scheme—the extension to Three Bridges—will be opened on July 17. Thirty-three new trains will be employed, fitted with high speed motors and stream-lined, so that speeds of 70 miles an hour will be possible. The third class compartments have been built like the old first class compartments, and extra width has been given to the seats. The coaches have been built to the maximum width limit of the track, so it is impossible to use the 'bay window' type of look-out for the guard. The guards will see the signals through a periscope which projects through the roof. The signalling system has been changed throughout the route from the semaphore to the colour-light type. Whenever a train passes, the signals are automatically put to danger. An ingenious device is fitted in every signal-box which enables the signalman to know the exact nature of the trains that are approaching and their times. From July 17 there will be 61 trains running daily from London to Three Bridges, compared with 27 at present, while Three Bridges will have 57 trains to London in place of 19. The fastest trains have been timed to do the 30 miles in 39 minutes, but the average time for all the trains has been reduced from 60 to 52 minutes. The second stage of the scheme will probably be completed by March next.

Gyro-stabilisers for Liners

ALTHOUGH the theory of the gyroscope has been taught for more than fifty years in several universities, it is only recently that the instalment of gyro-stabilisers for ships, yachts, and aircraft carriers has begun to be adopted. The largest gyro-stabilising plant in the world has recently been completed for the new 46,000-ton luxury Italian liner *Conte-di-Savoia* at the works of Messrs. Vickers, Armstrong, Ltd., Barrow-in-Furness. An interesting account of the plant is given in the *Metropolitan-Vickers Gazette* for April. The plant consists of three identical stabiliser equipments, each one of which can function as a stabiliser independently of the other two. The rotating element in each consists of two solid forged steel disks. The rotating part (the rotor) weighs 110 tons and at normal working speeds it rotates at 910 revolutions per minute, being driven by a spinning electric motor mounted directly on the shaft. This motor is of the three-phase type and gives 560 horse-power at the normal speed. It is capable of giving 750 horse-power for 90 minutes during the accelerating period. The Sperry gyro-stabiliser is used, and this never allows the vessel to start rolling. A single wave can start a roll. In an unstabilised vessel, should the period of the rolling swings and the waves be the same, resonance might occur, and if the damping were small the rolling might become dangerous. Usually, however, the waves are only synchronous with the ship's natural swing for a brief period, and so its maximum swing is due to the accumulated effects of the waves. The Sperry device quenches the effects of these waves one by one, and so the stresses and strains on the hull of a stabilised ship are comparatively slight.

Human Improvability

DR. C. S. MYERS contributes an article on "Human Improvability" to a recent issue of the *Bristol Medico-Chirurgical Journal* (vol. 49, No. 183). He says that the problem of human improvability is as interesting as it is difficult. One difficulty lies in the definition of *improvement*, which is not necessarily synonymous with *progress*, and for which we can have only subjective criteria. The prevailing biological view is that all changes in living form and function are evoked by accident, and are perpetuated by heredity and by their suitability to the environment; improvement might then be regarded as involving a more perfect adaptation to the physical and social environment.