results of this Congress will be the further spread abroad of research into the plastic behaviour of structures.

There were many useful and fascinating papers of a more practical nature, notably that by H. Shirley Smith (London) on the influence of erection methods on the design of steel bridges, and one on thin-walled (light-gauge) structures in America by G. Winter (Ithaca, U.S.A.). The latter formed a link with the more theoretical papers, such as that by Ch. Massonnet (Belgium) on the buckling of webs. It was Winter who pointed out in the discussion that too much effort has always been expended on the consideration of the somewhat ill-defined point where buckling begins, whereas what is important to the engineer is not this point—since the member still continues to support its load—but the ultimate carrying capacity of the member. It appears, therefore, that it is not only in framed structures, where plasticity rules, that the engineer will turn in future to the new philosophy of design and will adopt the collapse condition as the criterion.

Much interest was shown in the two working sessions dealing with concrete and reinforced concrete structures, though no striking new work was reported. The vast and complex problem of the corrosion of reinforcement was discussed and, in view of the new philosophy of design mentioned above, the need was stressed for moving the emphasis in research from the behaviour of simple members to a consideration of the ultimate strength of continuous systems in reinforced and also in pre-stressed concrete.

In addition to the working sessions there were many social engagements and visits. Cambridge was in its most delightful mood, though the sun did not shine during the garden party given by the Master of Christ's College; the visitors certainly took away with them to London, where a further programme of visits and functions had been arranged, an impression of academic calm which might not survive a visit in October, when the seven thousand undergraduates and the 675 teachers are in residence.

SPACE TRAVEL

A PUBLICATION of the British Interplanetary Society, "The Artificial Satellite"*, edited by L. J. Carter, includes the proceedings of the Second International Congress on Astronautics, held in London last year (see *Nature*, 168, 733; 1951); a very full account is given and following this are six of the papers read at the Congress. The first of these, "The Artificial Satellite", by L. R. Shepherd, technical director of the British Interplanetary Society, emphasizes the necessity for setting up a project for the development of satellite vehicles under civilian control. He points out the immense advantages of such vehicles as scientific research stations and observatories, though of course from the astronautical point of view their real advantage would be found in their use as a springboard for interplanetary flight. The subject is very carefully discussed from various points of view, and the conclusion is reached that the most feasible project would be to have space stations circling the most important planets and satellites, ion rockets plying between the space stations, while normal rockets, either conventional or nuclear-powered, would operate between

the planetary surfaces and the space stations. The importance of setting up a supply base on the moon at an early stage in the development is emphasized. Propellants and material would be manufactured there, and it would be very much easier to supply an earth-satellite station from the moon than from the earth.

Lyman Spitzer, jun., of Princeton University Observatory, has a paper "Interplanetary Travel between Satellite Orbits", which shows what we might expect from a rocket powered by nuclear energy.

Among other papers may be mentioned that on "Descent from Satellite Orbits using Aerodynamic Braking", by T. Nonweiler; "Meteor Hazards to Space-Station", by Michael W. Ovenden; "Minimum Satellite Vehicles", by K. W. Gatland, A. M. Kunesch and A. E. Dixon; and "Establishing Contact between Orbiting Vehicles", by R. A. Smith. Summaries of eleven other papers presented by various societies in America and Europe are also published.

A recent issue of the *Journal of the British Interplanetary Society* (2, No. 3; May 1952) contains a number of papers which deal mainly with astronautics. D. Hurden contributes the first of these under the title, "The Design of Rocket Motors", which gives elaborate details for designing a liquid-fuel rocket motor. C. A. Cross has a paper with the title, "The Fundamental Basis of Power Generation in a Satellite Vehicle", which deals with artificial satellites. He suggests that probably the first of these will be small unmanned rockets, telemetering instrument readings to the earth; these may ultimately develop into unmanned bases for orbital refuelling which will lead to the exploration of some of the members of the solar system. As the various projects of such satellites require an electrical power source, and the transportation of material to them would be a formidable matter, the author examines the possibilities of utilizing the sun's radiant energy and shows that such a method is fundamentally sound and a practical proposition. Patrick A. Moore deals with a number of asteroids which have made comparatively close approaches to the earth in recent times and suggests that some of these may be used in astronautics as refuelling stations. In the United States this subject has recently been receiving serious consideration.

THE MILITARY COLLEGE OF SCIENCE, SHRIVENHAM, WILTS

WITHIN the past few months, there have been announcements of two interesting innovations connected with the Military College of Science, Shrivenham. In July the War Office published details of the scheme, outlined by the Secretary of State for War in his speech on Army Estimates, for direct entry to the College.

This new scheme aims at increasing the number of Regular Army officers with scientific and engineering qualifications, a step rendered necessary because of the ever-growing complexity of modern weapons and methods of war. A candidate who is qualified to begin a course of study for a University of London (external) degree, on passing the Regular Commissions Board, will be called up for National Service in September and will spend a year in basic training, at an officer cadet school and as a National Service officer in an active unit, before joining the College. At Shrivenham he will become, for all intents and purposes, an undergraduate reading for a London

* The Artificial Satellite. (Proceedings of the Second International Congress on Astronautics, London 1951.) Edited by L. J. Carter. Pp. iv+74. (British Interplanetary Society, 12 Bessborough Gardens, London, S.W.1, 1952.) 5s. 6d.

(external) degree in natural science or engineering. His regular commission will be granted at the end of his second year at the College, and on graduation his seniority will be antedated to agree with that of an officer who has passed through Sandhurst, his exact position being determined by the class of honours obtained in his degree. This scheme is open to schoolboys between the ages of 17½ and 19½, and to officers or men between 18½ and 20½ already doing National Service. Officers who take advantage of this scheme are required to agree to serve as Regular officers for at least five years from the date of graduation.

This is additional to the normal mode of entry, via the Royal Military Academy, Sandhurst. The effect is that, by whatever channel an officer enters the Army, he is given an opportunity of studying for a university degree in science or engineering; and even if on entry he is not in possession of all the requisite qualifications, he will find at Sandhurst an opportunity for further study to complete them.

In April, the Ministry of Supply sponsored a scheme for ten studentships for civilians, value £265 per annum plus fees, tenable for three years at the College. The holders of these studentships, which are awarded on school reports and a competitive interview, are required to read for a London External Special Degree in natural science or for the degree in engineering. The primary object of the scheme is to train young men for posts in the Government scientific service, and on graduation the student is expected to enter the competition for scientific officers and to accept a suitable post, if offered. This is the first time during its history of nearly a century that the College has opened its doors to civilians, and the large entry received for the first ten studentships showed that the prospect of life at a residential college in an attractive area of English countryside appealed to many.

O. G. SUTTON

COUNCIL FOR THE PRESERVATION OF RURAL ENGLAND

ANNUAL REPORT FOR 1951-52

THE annual report for 1951-52* of the Council for the Preservation of Rural England again stresses the need for a dispassionate assessment of the country's national resources in land as a whole, but records the view of the Council that the balance needs to be redressed more in the direction of agriculture and the safeguarding and creation of amenity, on which other interests are encroaching unduly. Insufficient attention is also being paid to land reclamation in all its aspects and to the important problem of restoration after exploitation. Such forms of exploitation as open-cast coal working should, in the Council's opinion, be terminated at the earliest possible moment. The safeguarding and creation of amenity, in fact, are receiving less and less consideration, whereas they should be one of the main purposes of planning legislation; moreover, while the requirements of the Departments of State are by law outside the control of the planning authority, something other than mere consultation at departmental level is required in assessing true priorities where the relative values of land use on a national scale are concerned.

* Council for the Preservation of Rural England. Annual Report, 1951-52. Pp. 50 + 4 plates. (From the Council, 4 Hobart Place, London, S.W.1, 1952.)

Much time is still occupied by the consideration of the land requirements of the Armed Services so as to ensure that evidence is provided on amenity and scientific grounds wherever appropriate. Settlement of the outstanding requirements is regarded as unlikely to give a total varying much from the present figure of 550,000 acres compared with the estimate of 619,000 acres of the 1947 White Paper. The report comments pointedly on the delays in announcing the results of public inquiries and on the little time allowed to the Council or the local authorities in submitting comments on the Services' proposals as compared with the extreme leisure in which the proposals are handled by government departments.

Further reference is made in this report to the question of mineral extraction, and particulars are given of some cases with which the Council has been concerned. The situation as regards electricity undertakings was described fully in last year's report and is regarded as unchanged, but the Council records its opinion that much more could and should be done to avoid disfigurement in rural areas. In regard to the administration of national parks, the Council supports the view of the National Parks Commission and endorses the Commission's stand against the schemes of the British Electricity Authority in the Snowdonia National Park. The problem of refuse disposal in rural areas has caused some difficulty, and examples of successful action by the Council are quoted.

The efforts of the Council and associated organizations succeeded in securing certain amendments to the Forestry Bill in Parliament which removed the misgivings caused by the original Bill's disregard of amenity, and the Rivers (Prevention of Pollution) Act, 1951, was likewise greatly improved during its passage through Parliament, by amendments sponsored by the Council through its representation on the Central Council for River Protection. All such achievements must, however, be considered in the light of the growing tendency to disregard amenity, which is stressed at the outset of the report, and of the precarious financial position of the Council, which requires at least four thousand additional annual subscribers of one guinea or more to provide a sufficient income for the current year.

SECOND INTERNATIONAL CONGRESS ON RHEOLOGY

IT will be recalled that the First International Congress on Rheology was held in Scheveningen, Holland, in September 1948 (see *Nature*, 162, 747; 1948). A Dutch Organizing Committee was responsible for the arrangements for the Congress, which was held under the auspices of the Joint Commission on Rheology, International Council of Scientific Unions. Dutch industry provided the necessary funds. It was generally agreed that the Congress was most successful.

With the approval of the Joint Commission, the British Society of Rheology is organizing a Second International Congress, to be held in Oxford during July 26-31, 1953. The headquarters of the Congress will be at St. Hilda's College; accommodation has also been reserved in other Colleges.

The programme will include an address by the president, Sir Geoffrey Taylor, and invited lectures from some half-dozen prominent rheologists. Mme. A. Dobry-Duclaux (Paris), Dr. P. Eggleton (Edin-