It is pointed out that the force of the detonating explosive momentarily creates a thin zone of melted metal between the carbon steel base-plate and the stainless steel 'skin' in this case, resulting in the effective welding of the two metals together. A photomicrograph included in the article convincingly shows the bond between the two steels as joined by the explosives.

The process has been extended by the Explosives Department to the production of developmental quantities of steel plate with claddings of nickel, nickel alloys, cupro-nickel, copper, brass, titanium and several special alloys. Steel plates can be clad with metal skins from 1/16-in. to 1-in. thick, depending on the nature of the cladding material, and surface areas up to 140 sq. ft. have been successfully realized.

A most rigorous laboratory-testing programme was concurrently designed to prove the high quality of these explosive-bonded materials. This included ultrasonic inspection, bend and bond-strength tests, hardness

measurements, corrosion and thermal resistance investigations. "In thermal-resistance tests, the new materials have withstood repeated cycles of 1,000° F., followed by quenching. They also have been heated to peak temperatures of 1,750° to 2,000° F. and then quenched without failure." It is further claimed that explosively bonded plates can be cut and trimmed "... by shearing, sawing, flame cutting, abrasive-wheel or plasma-arc cutting, planing, milling or grinding. In addition, they can be formed by both hot and cold shop methods, including rolling, pressing and flanging, without bond separation."

There would appear to be little doubt as to the commercial feasibility of this new explosives metal-bonding process in view of these results; incidentally, it opens up a new vista in the use of explosives as a versatile industrial tool, one which, subject to obvious safeguards, must inevitably command the interest of all concerned with metal cladding.

FOLK-LORE AND FOLK-LIFE IN BRITAIN

THE formation in 1961 of the Society for Folk Life Studies met a long-felt want among scholars engaged on research into the traditional ways of life in Great Britain and Ireland. Publication of a journal was planned to be one of the Society's chief functions, and the first volume, containing eight articles ranging over a diversity of subjects, sets an initial high standard of research and authorship*.

Miss Anne Buck, keeper of the Gallery of English Costume in Manchester, contributes an excellent study of the countryman's smock which does much to dispel the many fanciful theories so often held about these interesting traditional garments.

The craft of bowl-turning and spoon-making is described by Mr. F. Geraint Jenkins of the Welsh Folk Museum, and that of hand wool-combing by Mr. H. Lemon of the Wool Industries Research Association. Both these articles are well illustrated by photographs which show in detail the various processes of the crafts described.

Mr. F. Atkinson, director of the Bowes Museum, Barnard Castle, writes fully on "Knur and Spell and Allied Games"

in an article which helps to clear up a great deal of confused thinking about the methods of play and the locale of such games.

It is a criticism often levelled at folk-life and folk-lore scholars that their interests are mainly rural. This is confounded in an excellent article by Mr. D. McKelvie, English lecturer at Swinton Teachers' Training College, on "Aspects of Oral Tradition and Belief in an Industrial Region". Mr. McKelvie has carried out a detailed investigation of working-class life in modern Bradford, and the result is a fascinating survey of the homes, the minutiae of daily life, even of the folk-lore of an urban community to-day. Mr. McKelvie is to be congratulated on his piece of research which goes far deeper than the usual economic or sociological survey so often made. His work will, we hope, be followed in other areas—in new towns, for example, or in the vast housing estates growing up as adjuncts to our more ancient cities.

* *Folk Life*, 1. (*Journal of the Society for Folk Life Studies*.) Pp. 112 + 24 plates. (Cardiff: Folk Life Society, c/o St. Fagan's Castle, 1963).

NUTRITION IN BRITAIN 1950-60

BETWEEN 1940 and 1949 the National Food Survey of the Ministry of Agriculture, Fisheries and Food published two reports on *Domestic Food Consumption Expenditure in the United Kingdom*, and since 1950 has issued reports annually. These are based on surveys of households of different family composition and income in different parts of the country; they not only show average domestic food consumption and expenditure, but also make comparisons for regions, family size and income. The nutritional value of the food consumed is calculated and compared with a standard of requirements (the British Medical Association standard) considered necessary for satisfactory health and physical development. The reports are the only easily accessible source of information on food consumption and its trends in the United Kingdom. No other country undertakes annual national surveys of this nature.

Mr. R. Lambert has made a critical study of the reports from 1950 to 1960*. While admitting that they are of great value in showing national trends in consumption,

he considers that they do not direct sufficient attention to findings which suggest that the nutrition of large families is unsatisfactory. He implies that facts are being collected for facts' sake and do not lead to action on the part of the Government. He also criticizes methods of presentation and discusses the difficulties of using dietary standards to assess nutritional levels. He believes that the survey should have broader terms of reference, that is, it should be extended by investigations of the state of nutrition of vulnerable groups, involving anthropometric, clinical and biochemical studies. By extrapolating the survey data to Britain as a whole, he estimates that a third of the population is living in households obtaining less than requirements for two major nutrients—or only just obtaining requirements—while 25 and 12.5 per cent are in the same position for three and four nutrients respectively. This relates, of course, only to requirements in terms of the British Medical Association standard, and does not mean that clinically evident malnutrition exists in the sections of the population concerned. He considers that certain figures for height from large families provide some indication of unsatisfactory nutrition.

Mr. Lambert's implication that the survey minimizes disquieting facts is somewhat unfair. The findings are

* *Nutrition in Britain 1950-60: a Critical Discussion of the Standards and Findings of the National Food Survey*. (Occasional Papers on Social Administration, No. 6.) By Royston Lambert. Pp. 46. (Welwyn: The Codicote Press, 1964.) 7s. 6d.

presented in separate chapters dealing with average household diets and expenditure, diet in different social classes, geographical differences, and special investigations concerned with matters such as the effect of the housewife's age and employment on the family's diet. There is no overall summary. The early chapters give an encouraging picture of general improvement, while some of the later ones deal with less-satisfactory aspects of the situation. But the facts are there, even though they may be overlooked by the casual reader.

Nutrition in Britain 1950-60 is of value in emphasizing that a complacent attitude towards national food consumption should be avoided, and also in analysing some of the technical difficulties in applying any dietary standard, as well as the defects of the British Medical Association standard itself. The future of Britain lies with its children, and we must be certain that they are properly fed. Any evidence that their diets are not fully satisfactory should be taken seriously and calls for further investigation.

JOYCE DOUGHTY

NOCTULE BATS FEEDING ON COCKCHAFERS

NOCTULE bats usually hunt their prey at tree-top height, with a rapid, powerful flight, though they have been recorded as flying low to take cockchafers. Cockchafers only fly over a short period, and the combination of the flight of cockchafers, noctule bats and observer occurs too seldom.

In 1960 the Earl of Cranbrook found noctules and serotines (*Eptesicus serotinus*) hunting summer chafers (*Amphimallus solstitialis*) and watched them on three successive evenings*. For most of the time the bats flew up and down, parallel to and a few yards from the hedge in which the chafers were crawling, seizing them as they flew from the twigs into the open. At fairly frequent intervals a chafer would make a loud buzzing noise from inside the hedge, as if it were caught up in some obstruction. If this noise lasted more than five seconds or so it almost invariably brought a bat so close to the hedge that it seemed to be picking up its prey from among the twigs. On no occasion was a bat actually seen to pick a chafer from the hedge, but they were obviously attracted by the 'loud buzzing' ones.

H. G. Barnett and the Earl of Cranbrook were able to watch noctules catching June bugs flying in and about some oak trees standing in the park and garden of Great

Glemham House for ten days in 1963. Usually, on any fine night in summer, they can be seen hawking their prey in the normal way at tree-top height, when they are easily seen against the sky. An exact count is impossible: the bats are not concentrated but diffused as individuals over a wide area. On a normal night, about six to a dozen noctules can be seen hunting over an area of about ten acres.

When hunting cockchafers they were much more concentrated, presumably because their prey, too, was concentrated. Over a small area of about a couple of acres a score or more noctules hunted each night, showing remarkable control and manoeuvrability at low speeds. In general, the bats circled around among the trees, picking up the cockchafers as they flew out, but frequently a bat would be seen to fly right into the open spaces among the branches. At times the bats would slow down to pick up a cockchafer as it flew from the twigs, sometimes hovering with rapidly beating wings, sometimes stopping abruptly, the wings rigid and outstretched with the body held almost vertical. The bats took cockchafers at all heights, not infrequently flying below lower branches to pick up insects as they fell from above.

The report also describes observations with noctules and house-crickets.

*Transactions of the Suffolk Naturalists' Society, 12, Part 5 (January, 1964).

CURVATURE IN THE SPECTRA OF NON-THERMAL RADIO SOURCES

By DR. WILLIAM E. HOWARD, III, TOM R. DENNIS, STEPHEN P. MARAN
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A CATALOGUE of the available observational data on about 1,260 discrete radio sources has been prepared at this Observatory and will be submitted for publication shortly. A well-known difficulty in analysing flux density data is that systematic differences may exist between the measurements made by various workers, due to the different techniques of calibration and to the variety of equipments and observational procedures that have been employed. We report here some preliminary results on the spectra of extragalactic radio sources, primarily in the frequency range 38-3,200 Mc/s, which have been made possible by the determination of the necessary systematic corrections to various radio astronomy surveys, with respect to a uniform scale of flux density based on 148 small-diameter sources. For all but two of these sources, nine or more measurements of flux density at different frequencies were used. On Cygnus A, the best-observed source, 63 observations were included in the solution.

The flux density system, the systematic errors of the surveys and the parameters of each radio source were determined by the following procedure, using the IBM

7090 in the University of Michigan Computing Center. First, two unweighted least-squares solutions were made for each of the 148 sources to find the parameters in the following equations:

$$\log S_{\nu} = a_0 + b_0 \log \nu \quad (1)$$

$$\log S_{\nu} = a + b \log \nu + c (\log \nu)^2 \quad (2)$$

where S_{ν} is the flux density in units of 10^{-26} W m⁻²(c/s)⁻¹ and ν is the frequency in Mc/s. Next, Gauss's criterion was used to determine which equation gave statistically the best fit to the data, allowing for the fact that (2) has an additional degree of freedom to be considered. Then the systematic errors of each of the surveys were determined from the deviations of the points from the optimum equations and the standard deviation of a single observation (σ) was found for each survey. Each of the input observations was weighted by $1/\sigma^2$ and a weighted set of coefficients and systematic survey errors were computed. The input observations were corrected by the appropriate systematic errors, and the general iterative procedure was repeated four times. The procedure was tested for convergence and was found to be stable. Between the third