of candidates who sat for the City and Guilds examinations. The steep rise over the years 1941–50 was followed by only moderate increases in 1951 (834) and 1952 (1,479). In 1953 there was a sharp increase of 4,336, the number being fairly evenly spread over most established subjects.

Another important development in 1953 was the establishment of a new examining body provisionally entitled the Joint Examinations Board for the General Certificate of Education. This body will offer examinations having a bias towards the particular needs of pupils in secondary technical, commercial and modern schools and classes and the needs of students in institutions for further education. The Institute has undertaken, during the initial stages, the administrative and financial responsibilities of the Board, of which it is one of the sixteen sponsoring bodies.

## Properties of 'Nimonic 95'

A recent addition to the well-known series of 'Nimonic' alloys is discussed in a technical publication of Henry Wiggin and Co., Ltd., Thames House, Millbank, London, S.W.1. The highest creep resistance is normally obtained by solution-treating the alloy for 4 hr. at 1,150° C., or, if a coarser grain size is not a serious matter, for 1–2 hr. at 1,200° C. This is followed by reheating for 6–8 hr. at 1,080° C., followed by 16 hr. at 700° C. In each case the sample is air-cooled after the treatment. Among the high-temperature properties which are given, the 0·1 per cent proof stress, which is 51 tons/sq. in. at ordinary temperatures, is still 43 tons at 700° C., 17 at 900° C., and 4·1 at 1,000° C. The corresponding figures for the elongation per cent, measured on four times the square root of the area, are 25, 4·5, 11 and 59, the modulus of rigidity being 30, 25, 18 and 14 $\times$ $10^6$ lb./sq. in. At 870° C. the endurance under a stress of 20 tons/sq. in. is 10 $\times$ $10^6$ cycles, and at 16·8 tons 45 $\times$ $10^6$ cycles in about 300 hr. Among the creep data given the following figures may be mentioned: under a stress of 8 tons/sq. in., a creep extension of 0·2 per cent occurs in 10,000 hr. at 750° C., at a stress of 7·5 tons at 815° C. in 1,000 hr., and under a stress of 4 tons/sq. in. in the same time at 870° C. Rupture under creep in 1,000 hr. occurs under stresses of 16, 8·5, 5·5 and 2·2 tons/sq. in. at temperatures of 750, 815, 870 and 925° C. respectively.

## Gamma-Ray Sources for Radiography

A revised second edition of the "Memorandum on Gamma-Ray Sources for Radiography", first published in 1952 (see *Nature*, **170**, 186; 1952), has recently been issued (pp. 28. London: Institute of Physics, 1954; 3*s*. 6*d*.). As previously, it has been prepared by a committee of the Non-destructive Testing Group (formerly the Industrial Radiology Group) of the Institute of Physics. The physical characteristics of gamma-ray sources, with particular reference to the products of the Atomic Energy Research Establishment, Harwell, and of the Radiochemical Centre, Amersham, are summarized, and attention is directed to radiographic technique, protection of personnel and to the costs involved. The subject-matter has been brought up to date and has been extended in many respects, particularly with regard to the number of radioactive materials considered. For industrial radiography, sources consisting of the naturally radioactive gas radon-222, which is of high activity and small bulk, and cæsium-137, can be obtained from Amersham, and artificially radioactive sources—cobalt-60, tantalum-182, iridium-192 and thulium-170—from Harwell; in addition, the shorter-lived sodium-24 and gold-198 sources can be supplied from Harwell when specially ordered. One section of the memorandum deals with the sizes of sources and the design of source capsules, and in another an outline of gamma-ray radiographic technique—which, it is pointed out, is similar to that of X-rays—is given with references to further details. Other sections deal with the protection of personnel, the handling and transport of sources and the cost of installing equipment for gamma-ray radiography. The memorandum concludes with a comprehensive and useful bibliography and with data sheets for each of the longer-lived radioactive sources mentioned above. The data are reproduced from official sources.

## Cotton Growing in Northern Nigeria during the Season 1952–53

The progress report for the season 1952–53 from the Experiment Stations in Northern Nigeria of the Empire Cotton Growing Corporation (pp. 19. London: Empire Cotton Growing Corporation, 1954; 9*d*.) reports that, following the previous season's record yield of 113,510 bales of cotton, 17 per cent more seed was issued, although not all was planted, and some, which was taken by inexperienced cultivators, gave very little return. Early rains made cotton planting unduly late, and confidence induced by the easily obtained good yields of the previous crop led to less attention to planting and weeding. In consequence, the crop for export was only 95,445 bales, and the average return per ton of seed fell from 10 to 7 bales of lint. At Samaru, in Zaria Province generally and in some other areas yields were as good as in the 1951–52 season; the growth of the industry in the Gombe area (Bauchi Province) has been remarkable and is clearly capable of expansion. Yields in South Katsina were well below those of the previous season. Rainfall at Samaru was unusually heavy in July, well below normal in August, and about normal in total and in time of cessation (October). The growth of the crop was in general satisfactory. Insect damage was not unduly severe, that attributed to mirids (*Campylomma* and/or *Lygus* spp.) being less than in the two previous seasons. Red bollworm populations were lower except at Kontagora and Yola, and pink bollworm was higher than elsewhere at Yola and Gombe. Good control of *Campylomma* and a marked reduction in leaf tattering was achieved at Samaru by late spraying with 1 per cent DDT emulsion, and at Daudawa treatment with DDT emulsion gave a 50 per cent increase in the yield of clean seed cotton. Bacterial blight (*Xanthomonas malvacearum*) was more in evidence than in 1950–51 or 1951–52, and it seems probable that this disease in its several manifestations can be responsible for much damage to bolls, although differences between strains in the severity of symptoms displayed are not related obviously to differences in yield.

## Manganese and Metabolism in Potatoes

The importance of manganese in plant metabolism, though now established, is but little understood. In a study of the effect of manganese on the assimilation and respiration-rate of isolated rooted leaves of the potato, H. C. Ruck and B. D. Bolas (*Ann. Bot.*, N.S., **18**, 71, 267; 1954) have found that normal potato leaves will root readily after treatment with α-naphthaleneacetic acid (2 p.p.m.) but