Meanwhile, adequate new premises were planned in consultation with the appointed architects, Messrs. Lanchester and Lodge, of London. Work on the site began on October 2, 1950; the foundation stone was laid by the chairman of the Board of Governors (who at that time was also mayor of Reading) on October 3, 1952.

Transfer of the widely dispersed work of the College to the new buildings began at Easter 1955, when the top floor of the main block was handed over, and continued throughout the summer. This operation was completed early in September.

The College is at present organized in six departments: art and printing; building; commerce; domestic and women's trades subjects; engineering; science. During the first three weeks of the present session, 3,400 students enrolled and commenced their year's work: 1,700 for full-time and part-time day courses (most of them also attending additional evening classes) and an equal number for evening courses and classes only. In addition, more than 1,200 have enrolled at four associated evening institutes which are under the direct charge of the principal of the Technical College.

During the interim eight years pending completiou of the College buildings, the courses of study provided have been steadily augmented in range and progressively developed in level. Provision is now made for Higher National Certificate and corporate membership students in mechanical, electrical and production engineering, in building and in applied physics. Ordinary National Certificate courses are also provided in chemistry and commerce, and the former are developing towards Higher levels and the associateship of the Royal Institute of Chemistry. There is a wide range of crafts courses—many of them based on requirements for the full technological certificates of the City and Guilds of London Institute.

Courses for apprentices and journeymen in the printing industry have now been introduced and are meeting an important local need.

The Art Department, hitherto handicapped by lack of facilities, is now developing, and its policy is greatly strengthened by the interest of the University School of Fine Art.

The Commerce Department, offering courses leading to the intermediate and final examinations of many professional bodies, is also responsible for courses in modern foreign languages, retail distribution, grocery and further general education.

Domestic and women's trade subjects include various needlecrafts, catering, cookery, nursery nurses' work and pre-nursing. Much of this work is based on examinations; but provision is also made—at both the College and its associated institutes—for the housewife.

All departments also provide many short courses, including a number of postgraduate or refresher type which are arranged from time to time in consultation with industry, trade, commerce and various professional institutions.

The newly completed premises comprise a main block of four stories of total floor area about 100,000 sq. ft., and a workshops block of some 25,000 sq. ft. In order to provide, at this stage, the accommodation essential for the present known demands, emphasis has been placed on workshops, laboratories and drawing offices rather than on classrooms. There is no central hall or gymnasium; but a refectory, staff and students' common rooms, departmental libraries and staff studies have been included. There is also one large main lecture theatre. A master plan has been prepared by the architects for future development. The internal arrangements of the new buildings have been carefully planned in respect of both short-term and probable long-term requirements; they have been made as flexible as possible so that changes in the use of rooms and services can be made as simply and economically as possible. Invisible ceiling panel heating is provided, allowing uninterrupted wall space. Filament lighting is used generally, except for drawing offices and certain rooms in the Art and Printing Department, where fluorescent lighting is preferred.

In general planning, regard has been paid not only to the specific needs of each department but also to encourage the closest possible liaison between them, in the strong belief that all contribute their special elements within the total pattern of life to-day and also that each has much of lasting cultural value to share.

A plinth is provided in the main College forecourt for the display of pieces of sculpture, to be replaced every three years on the basis of a special competition arranged in co-operation with the University.

NATIONAL INSTITUTE FOR RESEARCH IN DAIRYING

THE annual report of the National Institute for Research in Dairying is a tribute to the remarkable variety of work which is being done to improve dairy products. Established in 1912 at the University of Reading, the Institute now has eight research departments. Three of these—the Departments of Dairy Husbandry, Feeding and Metabolism, and Physiology—deal, for the most part, with the problems, both immediate and fundamental, associated with the technique and scientific background of milk production. Included in the scope of these three Departments are questions of dairy farm management, the growing of crops suitable for feeding dairy cattle, the nutrition of dairy stock, and control of reproduction and lactation in cattle.

The other five departments—Bacteriology, Chemistry, Physics, Engineering and Nutrition—deal with the application of science both to farm production and to the more strictly industrial side of practical dairying. Problems, both *ad hoc* and basic, associated with distribution and manufacture of milk, and with the quality of milk products, are dealt with in these Departments, and they are inevitably concerned from time to time with investigations directly affecting the consumer of milk and of other dairy products.

Besides these eight Departments, there are Sections concerned with isotopes, statistics and psychology, as well as an experimental dairy.

Many investigations were begun or continued during the year. Further work on the rate of milk and milk-fat secretion, for example, has confirmed that the former decreases with increasing interval since the last milking more rapidly than the latter; the positive correlation between the milking-rate of an individual animal and the total lactation yield has been confirmed. It was also shown that the greatest number of new udder infections occurs in the first month of lactation, and in quarters which have not previously been infected the new infection-rate is found to be approximately 3 per cent in the

first month and 1 per cent for subsequent months; once a quarter has been infected and freed from infection, the probability of re-infection increases with the number of previous infections.

An examination of copper as a growth promoter in pigs indicated that either pure copper sulphate or a mineral mixture providing copper sulphate at about 0·1 per cent of the weight of the fattening meal gives an increased rate of growth in fattening pigs; even at this high level there is no suggestion that copper is toxic to fattening pigs. No benefit was obtained either in live-weight gain or efficiency of food utilization when the floors of styes were kept artificially warmed in winter.

Another inquiry revealed that, when measured in terms of the milk production of grazing cows, meadow fescue has consistently outyielded, in each of two seasons, both perennial ryegrass and cocksfoot. An investigation into the production of saliva by the cow showed that a milking cow, on a normal diet, in the course of a day probably produces more than ten gallons of saliva, a large proportion of which appears to be secreted while she is eating.

There are indications that the œstrogenic isoflavone, biochanin A, recently isolated from red clover, is present in other clovers, and also, probably to a lesser extent than in red clover, in timothy, Italian ryegrass, meadow fescue and cocksfoot. This substance is present (along with the related œstrogen genistein) in subterranean clover. It is, however, doubtful whether, in current agricultural practice in Britain, œstrogens in pasture plants have any significant effect on milk production or other physiological activities of livestock.

Claims made abroad that the addition of menadione to raw milk, or to the food of lactating cows, caused a marked improvement in keeping quality of milk could not be substantiated. In certain circumstances, menadione in the milk appeared to have a deleterious effect in cheesemaking. Its use as an additive to milk, in any event illegal, is also undesirable on technological grounds.

It was found that the gut contents of chicks about to hatch are sterile; but those kept without food after hatching develop a flora in a few hours. When recently hatched chicks are fed, a balanced gut flora is established within two days.

The whitening of milk which occurs at temperatures above 60° C. increases in magnitude with the acidity of the milk, and increases with additions of soluble proteins. On heating milk further, the rate of browning seems to depend only on the *p*H, the rate increasing with alkalinity. Milk sterilized in a plate heat-exchanger at 135° C. is whitened in colour and not browned.

The young calf was shown to be a poor converter of carotene to vitamin A. This seems to be the case for all very young animals examined, namely, calves, rats and chicks. Conversion efficiency increases with age.

A significant improvement in growth-rate and a reduction in the incidence and severity of scouring were frequently brought about in young calves by giving them an antibiotic supplement to the diet. The effect, however, appears to be much smaller where the calves are born and reared under good conditions of health and management.

An interesting finding was that the sense of smell seems to be less sensitive than the sense of taste in discriminating between flavours in dairy products, even when the observers concerned think otherwise.

SICKLE CELL GENE DISTRIBUTION

DR. H. LEHMANN has recently published two papers. The first is about the distribution of the sickle cell gene (*Eug. Rev.*, **46**, 3; 1954); the second deals with the Andaman Islands (*St. Bartholomew's Hospital J.*, **59**, 99; 1955). From the observation of Herrick in 1910 of a case of chronic anæmia in a Negro student characterized by 'sickle'-shaped red blood cells, investigations have continually proceeded. It was first shown by Huck in 1923 that sickle cell anæmia behaved as a simple Mendelian character and that heterozygotes or carriers could be identified by the anaerobic incubation of blood, whereupon fresh normal blood would take on the sickle appearance. The chemical aspect was studied by Pauling (1950), who found that sickle cells contain a hæmaglobin which differs in its physical properties from normal adult hæmaglobin. Normal and sickle hæmaglobins could be separated by electrophoresis.

The incidence of the 'sicklæmic' gene was high in American Negroes (about 10 per cent); but other races did not seem to possess it.

In 1944 and 1945 Evans initiated a large-scale survey on the frequency of occurrence of sicklæmia in West Africa, and found a 20 per cent incidence in 561 Africans from Nigeria, the Cameroons, Gambia and the Gold Coast.

Further large-scale observations were made in West Africa by Findley and his collaborators, the results showing a frequency not very different from those found by Evans. Sickle cells were reported from East Africa in 1945 by H. C. Trowell and from Northern Rhodesia (12 per cent) in 1946 by Beet. Altmann in 1945 reported their absence in South African Negroes.

In 1949 Lehmann and Milne examined nearly 5,000 individuals of twenty-four different tribes in Uganda. In the Nilotic tribes the incidence of sicklæmia was strikingly homogeneous and varied from 21 to 28 per cent.

Foy and his colleagues (1954) surveyed the southern Sudanese and found that the Nilotics fall into two groups, one allied to the Uganda Nilotics and the other with Half Hamitic affinities.

The former group had a high sicklæmia incidence and the latter usually a low one (0·8–3·9 per cent).

In Bantu-speaking tribes sicklæmia varied in incidence, from 2 per cent in the Bairu tribe to 45 per cent in the Baamba—a secluded pigmoid tribe in the forest of the Mountains of the Moon.

The distribution of the sickle gene in Uganda seems to be connected with the invasion route of the pastoral Half Hamites, being lowest among the Bantu along that route and highest in the less-accessible swamps, jungles and mountain tops.

Allison (1954) put forward another explanation of the variable incidence of the sickling gene in the Bantu. It is assumed that the invaders occupied the healthiest and least malarious zones of the country. It is further assumed that the sickling gene has a selective advantage in malarious tracts, the *S* hæmaglobin being less desirable to the malaria parasite than the normal *A* hæmaglobin. It follows that the sickling gene will be most frequent in malarious surroundings. This theory is supported by the fact that the Half Hamitic tribes all live in the least malarious areas of Uganda and that adjacent Bantu tribes share both low malaria incidence and low sickling. But as Herman points out, the question is