Two of the papers, given by R. D. Watts of the City University and Professor H. W. Gosling of the University College of Swansea, discussed the basic fundamentals of design but it was difficult to decide whether, ultimately, design should be regarded as a science or an art. It seems that design, without innovation, can be reduced to a fairly exact science but that innovation is probably an art depending largely on inspiration. "The designer, having achieved a yoga-like detachment, is visited by his daemon."

Computer aided design was discussed both for digital and linear circuitry by T. J. Hyde of the Marconi Company, Ltd, and J. O. Miles of the University of Cambridge respectively. The principal use of computers described was as "super" calculating machines to do all the long-winded sums which ought to be done during the design process. A particular example was the tolerancing of components and systems. This complemented the papers on education where a plea was registered that designers should improve their efficiency and "get their designs right first time".

CHEMOTHERAPY

Prostates and Polyenes

from our Microbiology Correspondent

THE discovery that the antifungal antibiotic candicidin has a dramatic effect on prostatic gland hypoplasia and hypertrophy has created considerable excitement in the microbiological and medical worlds. H. W. Gordon and C. P. Scheffner (*Proc. US Nat. Acad. Sci.*, **60**, 1201; 1968) observed that a daily oral administration of candicidin, a heptaene macralide produced by *Streptomyces griseus*, in dogs with benign prostatic hypertrophy produced regression of the gland size and epithelial cell heights, changes indicative of reduced congestion, granularity and papillations. Consequently the attractive possibility for an oral chemotherapy of prostate conditions is very apparent. A number of polyene macrolides were tested for their effects on the prostate gland and on canine prostatic hyperplasia; these included candicidin, amphotericin *B*, nystatin, filipin and fungimycin. All the drugs which were tested produced a reduction in the volume of the gland during 30 days of treatment and a dose rate of 5 to 20 mg/kg body weight. In one case a small dose (5 mg/kg) of candicidin for just 5 days effected considerable prostate reduction. The two heptaene macrolides candicidin and amphotericin *B*, as well as reducing the size of the gland, caused a marked return to normal histological morphology.

A major criterion for the acceptance of a new chemotherapeutic agent (in the case of candicidin, an old drug in a new situation) is the absence of toxic effects. Gordon and Schaeffner found no evidence for either gross or histological toxicity with any of the polyene macrolides given orally to dogs for up to thirty days. Mild gastrointestinal symptoms were noticeable with the largest dosages of candicidin used, but these were not sufficiently serious to warrant terminating the treatment. Thus, the use of polyene macrolides holds great promise for the treatment of benign prostate hyperplasia particularly because they seem to lack the toxic side effects of the progestational hormones that have been used until now. The mode of action of the orally administered polyenes remains unclear, but the authors consider it to be related to the hypocholesterolemic properties of these drugs and to have a physicochemical rather than antimicrobial basis. The hypocholesterolemic activity of these metabolites could be another invaluable discovery; details of this phenomenon are to be published shortly.

HUMAN GENETICS

Chromosomes, Sex and Crime

from a Correspondent

IN humans, the single *Y* chromosome causes development in the male direction; this is shown by the existence of *XO* females and *XXY* males. Although all normal males have one *X* and one *Y* chromosome, not all people with one *X* and one *Y* are normal males—some of them are attractive females.

Individuals with testicular feminization have well developed breasts and female genitalia but they have the normal male *XY* chromosome constitution. They have little or no axillary or pubic hair, the female organs are poorly developed, and normal but underdeveloped testes may be found in the abdomen or elsewhere. The single *Y* chromosome is not sufficient to ensure the development of the male sex.

Boczkowski (*J. Med. Genet.*, **5**, 181; 1968) has studied the pedigrees of nine cases of testicular feminization, one a champion swimmer. All were apparently female although with the normal male chromosome complement. Not one of eight cases investigated by laparotomy had a uterus and all had two testes. In the families of eight cases, the siblings comprised twenty-one normal females, fifteen normal males and five additional cases of testicular feminization. This gives an expected 1 : 1 ratio of *XY* : *XX* individuals when the propositi are excluded. Boczkowski found that some of the female relatives of the propositi had little or no axillary or pubic hair and delayed onset of menstruation was reported in two families. For this reason Boczkowski believes that the gene responsible for testicular feminization may have an effect which is dependent on the sex of the individual—that is, the trait may be sex modified. The gene would alter the occurrence of secondary hair and possibly the start of menstruation in females, and cause males to develop in the female direction. An alternative hypothesis that the gene is sex-linked and recessive cannot be excluded. Boczkowski's studies of blood groups, however, have failed to show any close linkage of the gene for testicular feminization to the Xg blood group gene or the colour blindness gene, both of which are located on the *X* chromosome, or with the autosomal blood groups ABO, MN, Rh, Kell and Duffy.

Abnormalities of the sex chromosomes among the inmates of institutions for the mentally defective or mentally ill have been revealed in several surveys. The most startling discovery has been that as many as 3 per cent of the inmates of maximum security state hospitals have an *XYY* chromosome constitution (*Brit. Med. J.*, **1**, 64; 1967; *Nature*, **219**, 351; 1968). Most of these men are unusually tall with a history of early conviction for crimes against property, although some appear to be normal (*Brit. Med. J.*, **2**, 315; 1968). This and mongolism are the prime examples of chromosomal conditions which affect human behaviour.