three times that of the 70,000 horse power turbines at Niagara Falls. This unit, a section of which is illustrated, develops 54,000 horse power under 89 ft. head at a speed of 81·8 revolutions a minute. The Los Angeles runner, with a head of 870 ft., develops 32,200 horse power at 143 revolutions a minute, while another (also illustrated) at Big Creek, California, has a capacity of 56,000 horse power at 250 revolutions a minute, under a head of 2200 ft.

The first part of the book deals with the fundamental problems of flow of water in pipes and open channels, through orifices and over weirs, on lines which are fairly general, due prominence being given to the Francis formulæ for weirs and the Ganguillet-Kutter formula for open channels. The third and last part of the book is devoted to non-uniform flow. The type and diagrams are clear and distinct. Exercises are given, with numerical answers, and there is a serviceable index. B. C.

Handbuch der Experimentalphysik. Herausgegeben von W. Wien und F. Harms. Unter Mitarbeit von H. Lenz. Band 11, Teil 3: *Elektrische Beleuchtung*, von Dr. Helmuth Schering; *Schwachstromtechnik*, von Prof. Dr. K. Küpfmüller. Pp. xiii + 501. (Leipzig: Akademische Verlagsgesellschaft m.b.H., 1931.) 46 gold marks.

THIS section of the handbook is divided into two parts. The first deals with electric lighting and its measurement, and the second with the technics of weak currents, including telegraphy and telephony.

Prof. Schering discusses lighting mainly from the scientific point of view, but his results are immediately applicable in practice. Interesting diagrams are given of the energy emitted by substances at various temperatures and how this energy is divided up amongst the rays of different wave-lengths. For measuring mean spherical candle-power Russell's method is given. Apparently in Germany it is possible to buy polar paper divided up into the requisite angles, and this greatly shortens the time taken to make a measurement by this method. Useful data are given in connexion with the Hefner lamp, which has played such a great part in the history of photometry. A good discussion is given of projector lamps. The 'weak current' section of the volume is well done. It is clearly written, the diagrams can be understood at a glance, and it is not overburdened with mathematical equations. A description is given of cables suitable for long-distance transmission. The use of Pupin coils is described, and oscillograms are given to elucidate their action.

Weeds in the Garden of Marriage. By George Pitt-Rivers. Pp. xv + 86. (London: Noel Douglas, 1931.) 3*s.* 6*d.* net.

IT perhaps might have been called more truly "Weeds in the Garden of Race Progress", for the very institution of marriage—as cultivated by Church and State—is one of the rankest weeds Mr. Pitt-Rivers finds. In his own words, his book is "a plea for a little more thinking", and it is backed by forcibly stated reasons for thinking as he thinks, and for seeing with him that a thoughtful application of the principles of eugenics to our economic and race problems is our only salvation; that, in fact, we are subject to compulsory restriction of reproduction, and eugenics only proposes to change the method of restriction to sterilisation rather than taxation, and shift its operation from the healthy to the feeble.

Mr. Pitt-Rivers is intensely in earnest, for, as Sir Arthur Keith points out in his introduction, he sees disaster stealing upon us, and if he reads the signs of the times aright, there is nothing that can save us. He sees the race, indolent, ignorant, and vain, using its power of reproduction to destroy itself; not only permitting, but even encouraging feebleness and disease to live by mating with intelligence and health, and to send forth new polluted streams, vitalised by that mating. Better, he says, incest and inbreeding than this steady undermining of intelligence and health. Incest gave us Cleopatra, and it would emphasise not only the good qualities of healthy stock but also the defects of the feeble and diseased, until the latter would perish of sheer inanition.

Make the world safe for intelligence, is Mr. Pitt-Rivers' cry, and all good things will be added unto you.

Creep of Metals. By H. J. Tapsell. Pp. xiv + 285. (London: Oxford University Press, 1931.) 30*s.* net.

FOR many years the maximum stress has been regarded by the engineer as the main criterion by which to estimate the strength of a material in service. It is now realised, however, that above a certain temperature the strength may not be truly disclosed by the ordinary tensile test, and a stress, which is often very much less than that which this test would suggest, may result in failure if sufficient time be allowed. The process which brings about fracture is a comparatively slow deformation known as 'creep'. Following on the pioneer work of Chevenard and Dickenson, a very large amount of information has been accumulated on this subject during the past ten years. It is, however, very widely dispersed through engineering and other scientific literature, and the author has performed a most useful service in bringing it together. No phase of the subject has been overlooked and a difficult task has been performed with marked success.

It is clear that as yet little or nothing is known about the ultimate physical explanation of the phenomenon. But the time has now come when it is possible for the author to devote the last chapter of his book to a consideration of the bearing of the facts on the design of structures to operate at those high temperatures at which such effects are most pronounced. In view of the present position of the knowledge of creep, no more than the author has been able to accomplish could possibly be expected, and a most valuable addition has been made to the literature dealing with what is too often the 'no man's land' between metallurgy and engineering. F. C. T.