1922 in the different states. Although he admits that he is "certainly no violent environmentalist," he vigorously combats the deduction from this correlation that "somehow high fertility in a group is *in itself* an indication of probable racial unfitness." On the contrary he submits the interpretation that a lessened birth-rate tends to accompany increase in wealth, although he places emphasis upon the consideration that other factors than economic ones are involved.

From this point, the reader is logically led into a discussion of human behavior and the birth rate, which is original not only because the data relating to normal sex behavior are new but also because of the author's implications. His presentation of the data is in the nature of a report upon a study still in progress and he warns against too sweeping conclusions. After an extremely painstaking statistical analysis the material so far collected is interpreted as pointing to a lessened frequency of sexual activity as "the intellectual content of life" becomes "more varied and interesting," an indication which receives support from further statistical evidence pointing to a smaller mean total progeny of men engaged in professional pursuits as compared with that of men engaged in pursuits less intellectual in character. To put it very crudely, the curve is "damped off" not only as a population lives in crowds, and tends to get above the poverty line, but also as it gets away from physical labor and occupations concerned with material matters and becomes more and more engaged in intellectual interests.

These are very stimulating conclusions not merely because they suggest, as the author says, further research at many points, but because of their "humanistic implications." Professor Pearl yields for a few pages only to the temptation to discuss them, but what he says is distinctly worth reading. As it may be inferred, his research has not made him gloomy in his outlook. Population will continue to increase, and the growth in population will very probably lead to wars, but it will not "inevitably increase the general wretchedness of human life apart from wars." In support of this optimistic view, he points to the facts that although we have gone a considerable way in the present cycle of growth, squalor, wretchedness and general unhappiness have not increased; that there is going on an orderly evolution of knowledge of how to control and use natural processes and, finally, that the human race is adaptively responsive to population pressure. To the modern adherent of the "inevitable misery doctrine" who is genuinely interested in an open-minded approach to the population problem Professor Pearl's contribution is to be recommended. No commendation is necessary to those who are conversant with the quality of his scientific work or with the vigor of his writing.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

AN AUTOMATIC THERMOREGULATOR, DEPENDING ON THE FLOW OF WARMED LIQUID[1]

THE following device has proved useful for maintaining a constant temperature in saline solutions that could not be heated by a direct flame; for instance, in the method described by Sollmann and Rademaekers[2] for studying exposed intestines of living animals in a saline bath formed from the abdominal walls, it is necessary to keep the bath at strictly body temperature, and this is done by adding saline solution, warmed to 55°, at a proper rate. This regulation requires a great deal of attention, and this was the immediate occasion for the construction of an automatic flow-thermoregulator. A toluene thermoregulator (I, in the figure), which is inserted in the bath, controls the admission of air and therefore the discharge of warmed saline from a Mariotte bottle (II).

The thermoregulator (I) consists of a glass tube (T) filled with toluene. The lower end of this is bent into a coil (C) which is immersed in the bath. The upper end of the tube is bent into a U, which is filled with mercury (M), with a setscrew (S), by which the level of the mercury can be regulated, as in an ordinary toluol thermoregulator. The tube above the mercury is somewhat expanded with an opening (O) blown in one side about 1 cm above the level of the mercury. The neck of the tube bears a stopper, perforated by a smaller tube, which ends just above the mercury and which is connected with the tube of the Mariotte bottle (II). The latter is maintained at a fairly uniform temperature in an ordinary water bath.

The level of the mercury is adjusted so that it is below (X) when the temperature in the abdominal pouch falls below 38° C., air then passes through (O) in the direction of the arrows into the Mariotte bottle, and the hot saline flows from the tip (P) into the pouch. As the temperature in the pouch rises, the mercury expands, closes X and shuts off the supply of air and therefore the flow from the Mariotte bottle.

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SPECIAL ARTICLES

NEW TERMS IN THE SPECTRA OF ZINC AND MERCURY

WE have recently reported (*Nature*, December 26, 1925) a pp′ group in the arc spectrum of zinc. This multiplet is similar to the one found by Ruark in the arc spectrum of cadmium in that it consists of four

[1] From the Department of Pharmacology, School of Medicine, Western Reserve University.

[2] T. Sollmann and A. Rademaekers, "Investigations on Saline Catharties," *Trs. int. d. Pharmacodyn. et de Thér.*, XXXI. 39, 1925.