

for the complaints they conjure up.

Muller indicted physicians too. Studies have shown, she said, that physicians often prescribe drugs to terminate a patient interview and to get on with the next patient. More physicians, she said, should follow the example of Richard Feinbloom of Harvard in trying to reduce prescriptions of psychotropic drugs by spending more time with patients who have emotional problems. Some 23 percent of all prescribed drugs are for psychological conditions.

The hospitals, Muller said, also contribute to the overmedication problem by sedating and soothing. It keeps patients quiet.

In spite of the difficulties of getting sundry implicated parties to accept their responsibility in dealing with drug overuse, the speakers offered some suggestions in this direction. The public, Penna asserted, should ask whether drug advertising is in its best interest. Perhaps a semi-government board, under the auspices of the National Academy of Sciences, might be given legal authority to review all drug ads before they are released to the public. [It is interesting to note that the American Medical Association House of Delegates discussed a resolution to clamp down on television drug advertising at their last convention but did not pass it.]

Some physicians, Muller said, are more willing to limit drug prescribing than others. Several local medical societies have set guidelines on prescribing, and Muller suggested other societies might follow their example.

The pharmacist, Penna said, might take nonprescription drugs that he feels are dangerous off his counter and dispense them to customers at his discretion. Many nonprescription drugs have as serious side effects as prescription drugs, Penna declared. Even the supposedly innocuous aspirin can cause gastric bleeding and seriously interact with anticoagulants.

As far as the public is concerned, the speakers tended to agree, that education may be part of the answer to drug overuse. The New Jersey Study of Youth and Drugs, for example, showed that youths in one community restrained from drug abuse because of "fear of mental damage"; in another community it was because of "fear of the law." We should also keep in mind, Muller said, that "you do not get rid of something unless you replace it with something else." The New Jersey study, Luria reported, shows drug use among New Jersey youths has reached a plateau in the past two years. He strongly believes that some of these youths might have found a replacement for drugs. It may be a return to good old sex, or participation in the "back to Jesus movement," he says. □

Prenatal sex hormone levels: A possible link to intelligence

Most neuroendocrinologists agree that prenatal hormones influence future behavior in some way. John W. Money at Johns Hopkins School of Medicine in Baltimore believes that high levels of fetal sex hormone may be a direct cause of increased intelligence. His report of this possible relationship, in the December *IMPACT OF SCIENCE ON SOCIETY*, stems from research into the effects of having excess androgen (male sex hormone) before birth.

An excess of androgen during prenatal life can be produced by a genetic malfunction of the adrenal cortex, the outer three layers of the adrenal gland. The adrenal cortex fails to synthesize cortisone and secretes in its place a precursor hormone that acts biologically like an androgen. In the female fetus this causes the external genitalia to differentiate into their masculine counterparts. In the male fetus it leaves no visible mark, but the newborn infant loses large amounts of salt. In both male and female infants the androgen excess produces premature signs of puberty. Since 1950, however, both salt loss and premature puberty have been treated and controlled by cortisone therapy.

Thus, since 1950, a generation of affected children has grown up unencumbered by postnatal androgen excess. It is these individuals Money has been studying. And it is among these individuals that he has found a high proportion with high IQ's. In an ordinary population 2.2 percent have an IQ of 130 or higher. In the excess-androgen group 12.9 percent have an IQ of more than 130 in both verbal and performance tests.

The group Money tested consisted of 70 males and females, but due to lack of funds he has not been able to contact and test a larger sampling (including siblings and parents of the affected individuals). And further tests, he says, are necessary to confirm his findings.

Related research, however, has helped to confirm Money's beliefs. He investigated a syndrome resulting from ex-

posure of the fetus to progestin (a synthetic form of progesterone, the female sex hormone that prepares the womb to receive the fertilized egg). In the past progestin was given to pregnant women to prevent threatened miscarriages. A side effect was that the external genitalia of the female fetuses were sometimes partially and occasionally completely masculinized.

This particular drug is no longer used but Money has been able to contact and test 10 females who were victims of the progestin-induced hermaphroditism. Six of the ten girls tested had IQ's above 130 and none had an IQ below 100. Here again there is a possibility that the findings may be unique and, "only an accumulation of more cases will be able to settle the issue," says Money.

Response to Money's findings has been low key, he says, because not enough researchers are into this particular field. But he is in touch with scientists in Tel Aviv and Holland who are working along similar lines. And the senior investigator in the endocrinology department at the Institute of Obstetrics and Gynecology in Leningrad has been working with patients suffering from the adrenogenital syndrome. He reports they have reached a higher than average educational status.

Money has no idea how the sex hormones operate in relation to intelligence but he feels they must work directly on the brain in some way. And if they do there are many possible implications. For instance, could it be that an investigation of some forms of mental deficiency would reveal a correlation with low or nonexistent levels of sex hormones at a critical period? Would a woman who knows there is a high possibility that she will give birth to a mentally retarded child consent to progestin therapy that might help the unborn child? "We are far from knowing the answers to these questions," admits Money, "but the possibilities for further research look particularly exciting." □

IQ level	Expected percentage	Observed percentage	Expected number	Observed number	Expected cumulative percentage	Observed cumulative percentage
130 or more	2.2	<i>12.9¹</i>	1.5	9	2.2	<i>12.9</i>
120-129	6.7	<i>18.6</i>	5.0	13	8.9	<i>31.5</i>
110-119	16.1	<i>28.6</i>	11.0	20	25.0	<i>60.1</i>
100-109	25.0	12.8	17.5	9	50.0	72.9
90-99	25.0	14.3	17.5	10	75.0	87.2
80-89	16.1	4.3	11.0	3	91.1	91.5
70-79	6.7	7.1	5.0	5	97.8	98.6
69 or less	2.2	1.4	1.5	1	100.0	100.0

1. Figures in italics show increased incidence of IQs above 110.

Observed versus expected frequencies of IQ of seventy adrenogenital subjects.