SCIENCE

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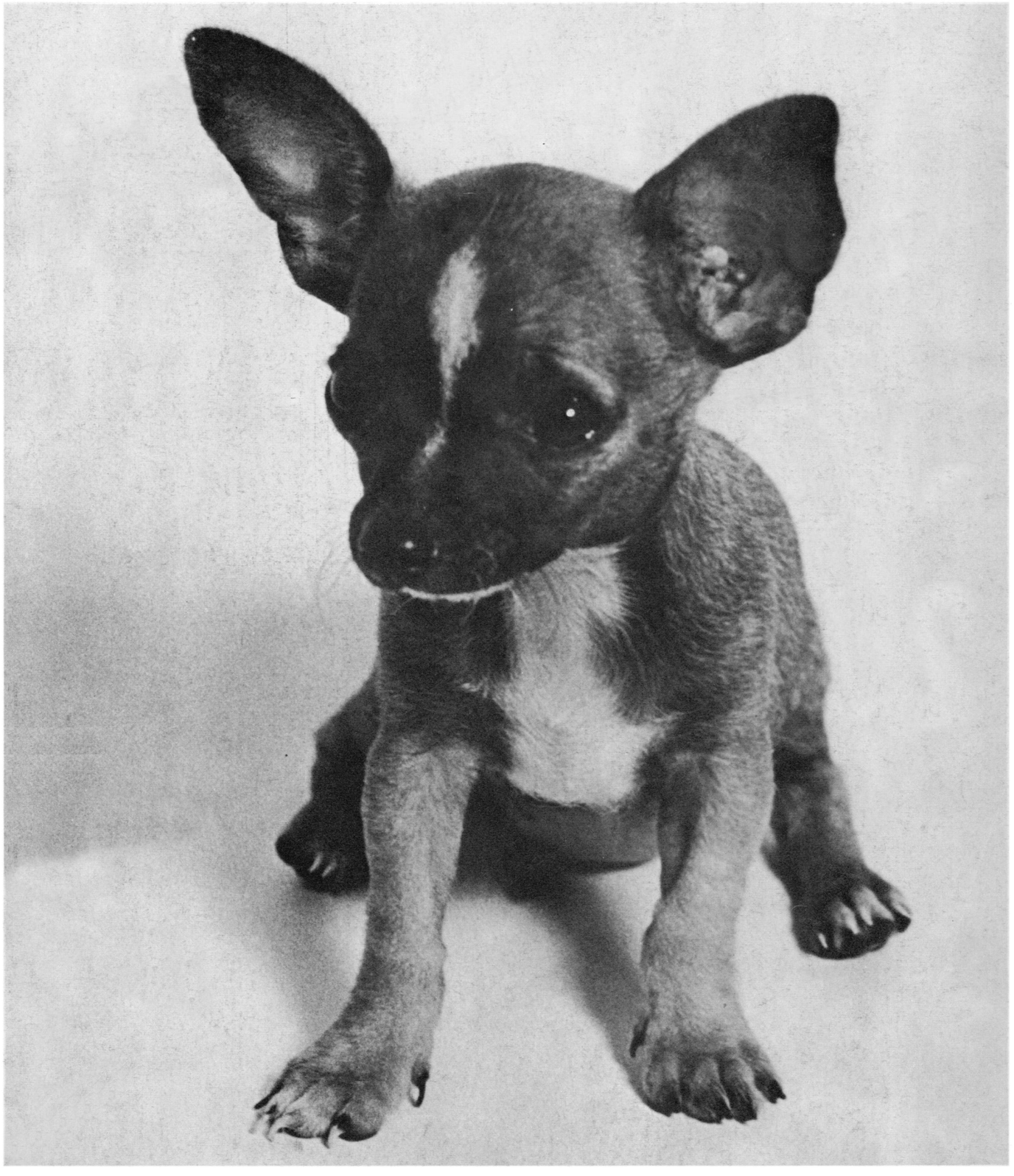
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



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The LKB Ultrolab Diluter is one of the fastest and most accurate diluters on the market. It will siphon up a preset volume of a sample liquid and flush it out with a preset volume of a reagent at a rate of up to 1200 times an hour.

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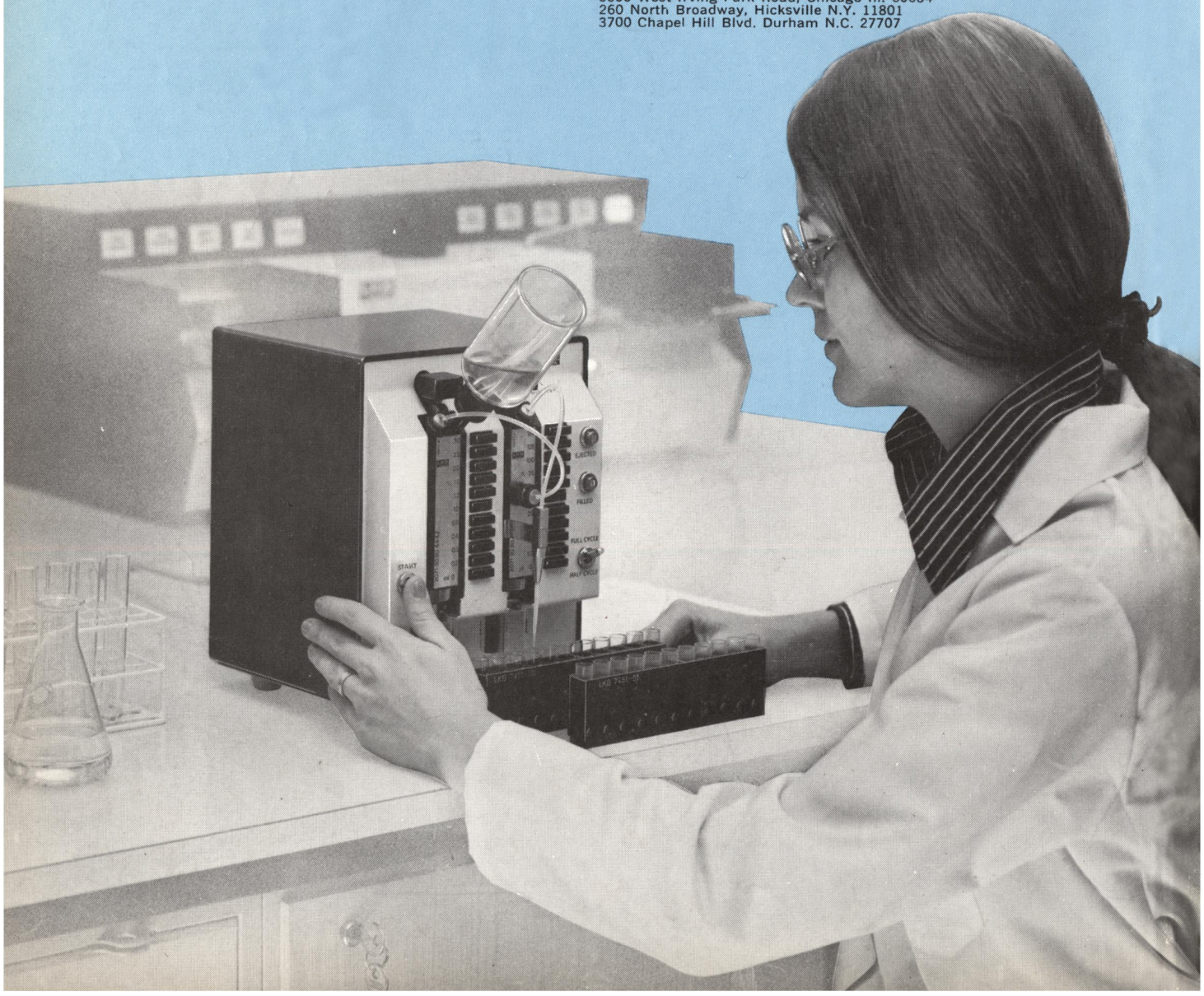


We want to be useful ...and even interesting

A gas

We have discovered a gas in which to immerse certain films and plates if you want to cut exposure time from, say, 5 hours to 10 minutes. Sorry it took so long to discover this gas.

The gas is highly explosive, though. It must be handled with utmost respect. Do not mess with it in the home. We wouldn't want to say even that it works on the film people buy for personal cameras. On the astronomical-type photomaterials where we have tried it, it works.

Before immersion in the gas at one atmosphere or so of pressure, O_2 and water vapor must be removed by vacuum or by flushing with dry, inert gas. Stay too long in the gas and fog goes too high. Optimum immersion time for the most speed gain with the least fog and loss of contrast depends on the particular batch of emulsion. For the current favorites in astronomical work, KODAK "Spectroscopic" Plates and Film, Type IIIa-J, immersion times run around 1½ to 3 hours.

The treatment almost completely eliminates the photographic devaluation of photons when they hit at low rates that call for hours of exposure (low-intensity reciprocity failure).

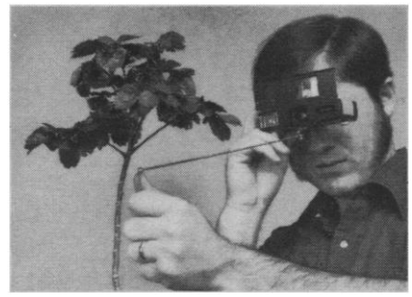
Little of the added sensitivity is lost by removal to room air for a few hours before exposure.

Hypersensitization by this gas is more even over the emulsion surface, and it gives more effect in much less treatment time than with previous methods. It can probably be made to work even on KODAK High Resolution Plates, but for them a few *days* of immersion in the gas might be needed just to bring a one-hour exposure down to 20 minutes. With longer treatment one might do better. Immersion time should be determined anew when the emulsion number changes.

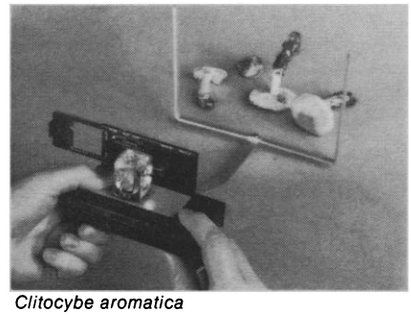
We do not manufacture this hypersensitizing gas. Indeed, we are willing to reveal its chemical formula.

Here it is: H_2.

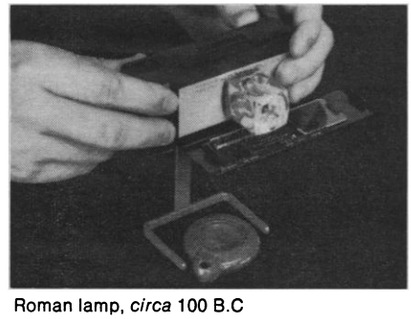
Adequate, adequate



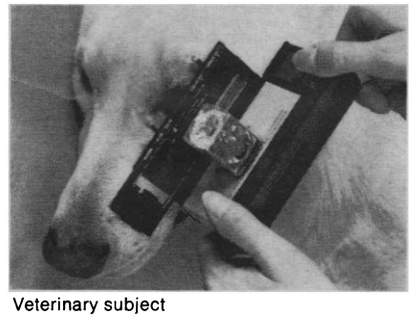
Aralia sp.



Clitocybe aromatica



Roman lamp, *circa* 100 B.C



Veterinary subject

The KODAK Pocket INSTATECH Close-Up Camera is for those who need photographic records of objects sized 25 cm or less (even a lot less, as can be seen from these illustrations) but hesitate to expend much talent or money on photography.

Certain accessories make the camera effective. Though we make only the camera, we can arrange to have information sent to you on the whole outfit. Write Kodak, Dept. 55W, Rochester, N.Y. 14650.

Stimulation in the simulation

Most cameras, including the one advertised at left, are used for color pictures today. Many decades ago we knew it would be so. In preparation, studies of a fundamental nature were done at the Kodak Research Laboratories on the measurement of differences in color sensation. Early on, it became clear that differences could be measured more precisely in the psychophysical laboratory than the fidelity with which photographic processes can simulate color sensations aroused in an original seeing experience.

Photographic duplication of color is a deep, multi-level subject.* Kodak ads go only so far as to suggest that you will find stimulation in the simulation.

"You" are assumed to be just folks, not a toxicologist who wants to press a button on an INSTATECH Camera to document the difference in color between *Amanita phalloides* and *A. citrina*. If such a button exists, don't look for it on any make of camera.

Cameras can and do serve as mnemonic devices, though, whether to recall distinctions between two similar toadstools or a marvelous afternoon with a beautiful child on the green grass under a blue sky.

Take notice that we have demonstrated a public preference in color prints for grass and Caucasian skin slightly yellower than average reality. As for blue sky, preference and reality in various climes pretty well coincide.

---

*A paper entitled "Objectives in Colour Reproduction," obtainable from Kodak, Dept. 55W, Rochester, N.Y. 14650, digs into it.

Kodak

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SCIENCE

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COVER

Chihuahua. [Lisa Lewis by Gary Laurish Photography, Washington, D.C.]

LETTERS

Harvard XYY Study

We feel that the report by Barbara Culliton (News and Comment, 22 Nov. 1974, p. 715) on the XYY study being carried out by Walzer and Gerald of the Harvard Medical School does not clearly lay out the nature of the study and its implications, nor the basis of of our objections. We and others in Science for the People have been concerned with both the premises and the social and political applications of certain programs of research into genetic factors in human behavior.

Implicit in these programs are the assumptions that we can and should attempt to distinguish between the behavior of groups of people on the basis of genetics. Many of these programs tend to focus the blame for supposed antisocial behavior on the genes of the individual, rather than on social, economic, and familial conditions. In the case of the XYY controversy, this orientation has led many researchers to hasty and far-reaching conclusions based on uncontrolled and biased experiments. In fact, the most recent and comprehensive review of the XYY literature concludes that ". . . the frequency of antisocial behavior of the XYY male is probably not very different from non-XYY persons of similar background and social class" (*1*).

The Boston study is a case in point. Walzer and Gerald are trying to determine whether there is any psychopathology associated with the extra Y chromosome. The study is funded by the Center for the Study of Crime and Delinquency of the National Institute of Mental Health. Those parents whose child is found to be XYY are told that the child has a chromosomal abnormality, and many specifically learn that it is XYY and of the conflicting information on this subject. It has already been reported that giving such information to parents induces anxieties about the child's behavior that would not have existed otherwise (*2*).

How is the researcher to know whether behavioral problems that arise in the XYY children are due to the extra Y chromosome or to the impact on the parent-child relationship of telling the parents of the abnormality? Certainly not by controls: there are no control parents who are told that their child is XYY. Thus the design of the study precludes the possibility of obtaining any information about the presumed relationship between the extra chromosome and the child's behavior. Yet in Culliton's report, the XYY myth is perpetuated by references to unspecified behavioral problems in some of the boys being followed. These statements lend stronger credence to the stigmatization which XYY males currently suffer.

Our original criticisms were concerned, in part, with the absence of informed consent. The procedures have very recently been altered in response to our objections. However, irrespective of the details of the new consent procedures, mothers are still led to believe that the benefits of taking part in the study outweigh the risks. Since there is no XYY syndrome and no possible therapy for a nonexistent syndrome, no benefit can accrue to the family. To the contrary, the myth of the "criminal chromosome" is so well known to the public that families in this study are put at substantial risk of psychological and emotional damage on learning of the child's extra chromosome.

In summary, this study cannot yield meaningful results, has no benefits but substantial risks to the families involved, and only serves to propagate the damaging mythology of the genetic origins of "antisocial" behavior.

JON BECKWITH, DIRK ELSEVIERS
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1. D. S. Borgaonkar and S. A. Shah, *Prog. Med. Genet.* **10**, 135 (1974).
2. G. H. Valentine, M. A. McClelland, F. R. Sergovich, *Pediatrics* **48**, 583 (1971).

Beckwith and his associates are entitled to interpret the literature on the XYY syndrome as a "dangerous myth," but they have no right to force their interpretation on others. Their view that knowledge is a danger from which the public needs protection is the same force that keeps textbooks out of West Virginia schools and leads to the type of academic McCarthyism that prevents Shockley and others with unpopular interests from fulfilling speaking engagements in our colleges.

Of course parents are entitled to an honest explanation of the proposal test and the option to reject it. However,

those parents who want information on the sex chromosomes of their infants are entitled to have it and the investigators must be entitled to provide it for them.

WAYNE H. DAVIS
School of Biological Sciences, University of Kentucky, Lexington 40506, and *Free Speech Committee, Kentucky Civil Liberties Union, 134 Breckenridge Lane, Louisville 40207*

The controversy over the ethics of identification and study of individuals of XYY karyotype is an example of our fascination for the exotic problems to the neglect of common but more serious genetic conditions, such as the XY karyotype that afflicts roughly half of the human race, including the writer.

Overwhelming statistical evidence indicates that the XY karyotype is associated with major social problems such as violent crime and war. If we are to provide medical and psychiatric assistance to XYY individuals, let us not neglect the XY's, who in aggregate present a much greater problem for the community.

MICHAEL MAGE
Laboratory of Biochemistry, National Cancer Institute, Bethesda, Maryland 20014

Protein Production

For a considerable amount of time we have been reading about the world food shortage and how the United States could be of assistance in solving the problem. Most often our agricultural methods of protein production are under attack. It has been stated that feeding grain to animals is an inefficient and wasteful means of raising protein. Moreover, it has been repeatedly expressed that we should raise more cereal for export and less for feedlot purposes. Rothschild (Letters, 6 Dec. 1974, p. 870) repeats these concepts.

Most statements regarding the conversion of grain to animal protein seem to be the result of armchair opinion, with little mention of where the protein that is responsible for our high standard of living should come from. One can only surmise that, instead of grain feeding, one would have to resort to grazing. However, the crux of the matter is overlooked. The amount of grain raised on 1 acre will feed six to eight times as many cattle as would 1 acre of grass in most places in the United States. In fact, on the intermountain plain and the high plateaus of the West, this ratio would be even higher. In addition, it takes nearly twice the amount of time to bring a calf to market weight when it is fed grass than when it is fed grain.

These are the economics of cattle raising and explain why animal protein is reasonable in price and available to most American households. Raising cattle on grass would not only increase the production cost, but would also reduce the available supply. This would result in greater price being demanded for animal protein that would be of poorer quality. Paradoxically, Rothschild's own "oxen" would be gored, and not those of the agricultural producer.

It is high time that the proposal that we not raise cattle in the feedlot be discarded as a false illusion and an unrealistic approach to solving the food shortage. Agriculture in the United States has proved to be the most efficient in the world; reverting to methods of the turn of the century will not solve the problem of hunger. A good point to consider is that a U.S. farmer can feed 61 people with his modern advanced methods, while a farmer in the Soviet Union can only feed 7 people. I agree that better education of the public with regard to nutrition is an aimable goal that deserves consideration, but also the adoption of successful U.S. agricultural methods should be seriously considered by other governments.

I know of no way other than by consuming animal protein that humans can obtain the amino acids they need, short of eating a large variety of cereals and legumes. There is simply not enough tillable land to meet this need. Only by producing sufficient animal protein can the world standard of living be raised and adequate nutrition supplied.

HORST KEHL
Route 4, Kirksville, Missouri 63501

Computer-Assisted Education

In her reply to Zelby's letter, Ruth M. Davis (Letters, 13 Dec. 1974, p. 975) says, "when computers . . . hold the questions, record the answers . . . [t]hen the real, comforting interactions can be between people." Indeed, but if the computer holds the questions, and the student is only exposed to the questions held by the computer, then a

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Women, Men, and the Doctorate

The proportion of women who receive doctorates is increasing—from approximately 12 percent in the 1960's to 16 percent in 1972 and 18 percent in 1973. In the physical sciences, the proportion remains under 4 percent.

Women and men with doctorates differ in almost every career characteristic except ability, and the contrasts in the physical sciences are generally broader than in other fields. A new study by John Centra* compares matched sets of Ph.D.'s from the classes of 1950, 1960, and 1968 as to marital status, employment, publications, income, and attitudes.

Nearly 40 percent of the women from the two earlier classes and 30 percent from the 1968 class never married, compared to 5 and 8 percent of the men. Among those who married, a fourth of the women and a tenth of the men are currently divorced or separated.

Employment opportunities for women with doctorates have been severely limited in private corporations, especially in the physical sciences, where 39 percent of the men but only 9.5 percent of the women are employed. In academic employment more men are at universities; more women at 2- and 4-year colleges. More women are teaching; more men are in administration and management. Men have higher academic rank, and more are presidents, deans, and department heads; while more women with comparable years of experience are instructors, lecturers, and assistant professors, or hold research appointments without faculty status. However, men publish more than women, regardless of field or employment setting.

Income is the area of greatest difference between men and women with doctorates. In all fields, disparity of income is fairly large for those with the least experience and becomes even larger for those with more experience. Men's income varies from an average $18,700 for 5 to 6 years of experience to $27,100 for 22 to 23 years of experience. For the same experience levels, women's average income is $16,400 to $21,800. Similar patterns exist in all fields, with the greatest disparity in the physical sciences, where the comparable figures are $17,800 to $29,100 for men and $14,700 to $21,300 for women. For university-employed Ph.D.'s and for Ph.D.'s from all employment settings combined, women with the most postdoctoral experience have incomes farthest below those of men with equal years of experience. At every academic rank at both colleges and universities (where two-thirds of the men and 70 percent of the women are employed) men's income exceeds that of women with equal years of full-time experience. In private companies, men average $27,000 and women $22,000. In the federal government, the disparity is least. Women with 5 to 6 years of experience earn 5 percent less than men, while those with 22 to 23 years of experience earn 3 percent less.

There are some signs of improvement. Younger graduates have benefited most from changing anti-nepotism rules and recent salary increases for women. Relative to earlier graduates, more women with recent doctorates are finding employment at universities, but the academic job market will not expand much over the next decade for either sex.

Cultural tradition, sex role expectations, and discriminatory practices have played a large role in the training and work history of women with doctorates who have not reaped the rewards enjoyed by many of their male colleagues. It is time that ability, hard work, and personal choice became the dominant factors in determining the careers of both men and women.—BETTY M. VETTER, *Scientific Manpower Commission, 1776 Massachusetts Avenue, NW, Washington, D.C. 20036*

* *Women, Men and the Doctorate*, John A. Centra (Educational Testing Service, Princeton, N.J. 08540).

AUDIO

TAPES

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