

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Sex Factor in Coronary Artery Disease

SIR.—The letter from Drs. A. R. P. Walker, M. Anderson, and I. Bersohn (*Journal*, May 26, p. 1234), "The Sex Factor in Coronary Artery Disease," gives further substance to the point I have indicated before^{1,2}—namely, that the sex ratio of the incidence is related to the total incidence of the disease in the population and, ultimately, to the diet of the population. Much more evidence to this effect is now at hand.

There can no longer be any doubt that coronary heart disease is excessively rare among the negro peoples in Africa, and all the evidence is that this is to be explained by the mode of life, particularly the diet, and not by a racial peculiarity.³ In our own work in Capetown last year³ it was clear that the frequency of coronary heart disease among the Bantu is only a small fraction of that among the local Europeans, with the Cape coloured people (racially unrelated to the Bantu) intermediate. These differences corresponded with a similar gradation in the average serum cholesterol and beta lipoprotein values in samples of these populations and with the fat content of the habitual diets. Within the racial groups the same relationship between diet and serum cholesterol was found. In spite of the belief of some racists, Bantu can apparently be transformed into Europeans, at least in regard to the blood lipids, by giving them European-type diets. Further, Bronte-Stewart and his colleagues⁴ have now shown in controlled experiments that the serum cholesterol in the Bantu responds like the white man to manipulations of the diet fat. Finally, we note that newborn Bantu babies do not differ from their local European counterparts in serum cholesterol concentration.⁵ Their mothers, however, differ greatly, as would be predicted on the grounds of their diets, irrespective of race.

It is not possible to dismiss the rarity of coronary heart disease in the African negro on the theory that it is genetically determined. I am informed that coronary heart disease is now appearing among the more prosperous negroes in the Gold Coast where economic and political conditions allow some of the population to change their diets towards the European pattern. Negroes in the United States are certainly not free from the disease. In a large charity hospital admitting both white patients and negroes in New Orleans, Burch and Voorhies⁶ reported the ratio between the races for the incidence of coronary heart disease to be around 4 to 1 for the period 1928 to 1937. However, over two-thirds of the cases among white patients were diagnosed from clinical and electrocardiographic evidence and less than one-third by necropsy, whereas all but four of the diagnoses among negroes were made by the pathologist. This reflects a bias in medical examination at that time when, in all respects, the negroes in the United States were far more under-privileged than now.

More recently, among 450 young U.S. soldiers with myocardial infarction, there were 63 negroes, or 7.4%. At that time negroes comprised about 10% of the entire U.S. Army.⁷ At present, Dr. Jeremiah Stamler finds that the age-specific death rate among negroes in Chicago is roughly equal to, or even exceeds, that for white people in the same community (statistical studies on the incidence of heart disease in Chicago; to be published).

Further information about the negro in the U.S. is provided by the study, just published,⁸ on 519 myocardial infarctions in a large hospital in Alabama where the negroes still do not fully approximate to the local whites in economic status, though their mode of life does not remotely resemble that of Dr. Walker's Bantu. The incidence of myocardial infarction among these negroes is estimated to be 52% of that among the white people served by this hospital. The sex ratio of infarctions among the white patients was 2.9 to 1 while among the negroes it was 1.2 to 1. However, it was observed that, whereas obesity was not unduly common among the negro men or among the white patients of either sex, all of the female negro patients were obese, which might explain the high frequency of infarction among the negro women.

Data on the Japanese in Hawaii and Japan add confirmation. Severe atherosclerosis and coronary heart disease are certainly rare in Japan. Dr. Noboru Kimura's analysis of 10,000 necropsies shows far less frequent severe atherosclerosis of the coronaries among Japanese in Kyushu than among Minnesotans of the same age, the ratio of incidence rates in middle age being of the order of 1 to 10.⁹ But, whereas in middle age the ratio of incidence among men to that in women is four or five to one among Minnesotans, in Kyushu it is scarcely two to one. Recently in Japan I found general agreement among Japanese cardiologists that Dr. Kimura's figures are comparable to their experience in other parts of Japan, and we ourselves had abundant opportunity to see that coronary heart disease is really not a common disease in that country (Drs. Paul Dudley White and B. Bronte-Stewart participated in the clinical studies). Dr. Kimura's data, as well as the analysis of a large morbidity survey by Dr. Akira Kusukawa,³ are in such good general agreement with the Japanese vital statistics on heart disease that the latter may serve as an indication of the true mortality situation in Japan.

The table gives data from the U.S. and Japanese vital statistics for 1949. The analysis of more recent data is in progress, but apparently the essential picture will be similar. For middle age, where the problem is perhaps more important, the mortality rates ascribed to coronary heart disease (including angina pectoris) are far higher in the U.S. than in Japan, and there is greater disparity between the men than between the women of the two countries.

Death Rates per 100,000 for 1949

Age	Population	Arteriosclerotic Heart Disease		Cerebrovascular Disease		Ratios Between Sexes	
		Men (1)	Women (2)	Men (3)	Women (4)	(1)/(2)	(1)+(3)/(2)+(4)
45-49	U.S. white	231.8	42.8	34.5	37.5	5.4	3.3
	Japan ..	24.1	13.5	89.8	98.6	1.8	1.0
55-59	U.S. white	637.9	176.7	123.4	109.2	3.8	2.7
	Japan ..	60.3	31.2	375.0	311.1	1.9	1.3
65-69	U.S. white	1,402.8	659.4	415.0	349.0	2.1	1.8
	Japan ..	125.1	77.5	1,216.2	934.1	1.6	1.3

From personal experience in Japan I believe their vital statistics may somewhat underestimate their incidence of coronary heart disease or, alternatively, our U.S. physicians may err in the opposite direction. In Japan some sudden deaths, where there was neither necropsy nor opportunity for adequate medical examination before death, are labelled "strokes" when in the U.S. or the U.K. they would be classed as coronary deaths. The physician is always influenced by his knowledge of the pattern of the disease frequency in his country, and there is no doubt that coronary occlusions are more prominent with us while cerebrovascular lesions are more common in Japan. In any case, such bias cannot explain the sex differential. The table gives the death rates ascribed to cerebrovascular lesions and the ratios of death rates between the sexes when both ascribed causes of death are combined.

As in the case of the negro, it is not possible to attribute the rarity of coronary heart disease in Japan to racial peculiarity. Coronary heart disease is not rare among Japanese long resident in the United States, where, for the most part, they live (and eat) as do other Americans. According to the U.S. vital statistics, 71% of all heart disease deaths among Japanese in this country were ascribed to coronary heart disease in 1953. The sex ratio of these coronary deaths was 4.6 to 1.

In Hawaii this spring Dr. Nils P. Larsen was able to convince us that the large population of Japanese there, who are moving far towards the American mode of life in regard to the diet, are also beginning to imitate Americans in regard to the frequency of severe atherosclerosis and coronary heart disease. For example, Dr. Larsen's necropsies on Japanese long resident in Hawaii disclosed severe atherosclerosis in 30% of the men aged 50 to 59. This is still only half the incidence observed in necropsies on white men of that age in Hawaii, but it is close to five times the corresponding incidence observed in necropsies in Kyushu. We ourselves saw a number of Japanese patients with coronary heart disease during a brief visit to Honolulu, and others were seen during a hasty trip to the sugar plantations. But during five weeks of work in Kyushu in the large university hospital and in various small hospitals and clinics we found no classical cases. The only recent specimen of a heart with a large fatal occlusion in the pathology department was from a doctor who had returned to Japan after 20 years of practice in Honolulu.

It is particularly significant that the diet in Japan is, and has been throughout history, extremely low in fats (less than 15% of calories from this source) but that the average diet of the Japanese in Hawaii is much closer to the U.S. pattern of 40+% fat

calories. Preliminary estimates suggest an average of about 30% fat calories for the Japanese men we studied in Hawaii. Further, the serum cholesterol averages of the population samples we studied corresponded to these dietary differences.

The most important conclusion from all of these comparisons is that masculinity itself is not a basic cause of coronary heart disease nor is immunity conferred by female sex hormones. Vital statistics, necropsy data, and clinical observations all agree that American females are more susceptible to coronary heart disease than are males of the same age in Japan or among the Bantu and other negroid peoples in Africa. We could also include on the one side the females of other countries where coronary heart disease is rife—e.g., some northern European countries—and, on the other, the males in some other populations—e.g., poor people in Spain and the general population of southern Italy. Should we conclude that men in Italy and Spain, as well as in Japan and among Bantu in Africa, are charged with female sex hormones and are lacking in masculinity?

None of this is to suggest that sex hormones have no importance. Sex hormones are always important, and that includes the problem of atherogenesis. But it appears that the female sex hormones offer their greatest protection—and that is limited—only in the face of such extraordinary atherogenic forces as are generated by the current mode of life of the most prosperous western society. Perhaps the female has a greater natural affinity for fat (in the diet as well as in her person) than does the male. At any rate they seem to be less affected by, or are more resistant to, a high-fat diet. But in the American and British contemporary scene it is clear that even female sex hormones are not enough to provide full protection. In the United States we are now recording some 5,000 coronary deaths a year among women under the age of 50 years. In Britain, too, I notice in the 1954 Registrar-General's report that some hundreds of relatively young women are dying each year with the diagnosis of "arteriosclerotic heart disease." If we take the sensible step of adding the figures for International List numbers 420 and 422, as the Registrar-General conveniently does for us for 1954, the sex ratio of death rates for such "degenerative" heart disease turns out to be 5.1 to 1 for the age range 45 to 49 in England and Wales.—I am, etc.,

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- 8 Keil, P. G., and McKay, L. V., *Circulation*, 1956, 13, 712.
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SIR,—We have read the letter by Drs. Alexander R. P. Walker, Marianne Andersson, and I. Bersohn (*Journal*, May 26, p. 1234) regarding the lack of importance of the sex factor in coronary artery disease among South African natives. These authors pointed out that "in a population relatively free from coronary artery disease differences in the severity of atherosclerotic lesions and in mortality rates from the disease between the sexes are not in evidence," whereas "in populations where the death rate is very high from the disease the corresponding figures are far higher in males than in females until old age."

In regard to this subject, we would like to call attention to the report of a recent study of the ratio of the incidence of acute myocardial infarction among 8,183 adults (90% were white) who came to necropsy at Washington University in St. Louis between 1910 and 1954.¹ In this population which underwent necropsy and which had a high incidence of acute myocardial infarction we found that a change has occurred in the relative incidence of the disease in the two sexes. In the period 1910–39 the incidence of acute myocardial infarction among men was twice as great as among women. In the period 1940–54 the corresponding incidence

among men was not significantly greater than it was among women. In the oldest age-groups the corresponding incidence was actually considerably higher among women than among men. The overall incidence of acute myocardial infarction was considerably higher among both men and women in the period 1940–54 than it was in the period 1910–39. However, even in the period 1910–39 the incidence was higher than that reported among the Bantu in South Africa.

It does not seem to us that our figures or those of Drs. Walker, Andersson, and Bersohn provide enough basis for sound generalizations. However, if we may be allowed to speculate along the same lines with the above authors, it appears to us from the figures available now that the sex factor operates extensively only at an intermediate level of incidence. When the incidence of coronary artery disease and its complications is very low the sex factor is not evident; at intermediate levels it is prominent; but at high levels it diminishes. It must be emphasized that this is only speculation and that many other variable factors are probably operating to produce the final results.

It is of interest to add that in a study now in progress² we have found an exceedingly low incidence of acute myocardial infarction among American negroes. Among approximately 3,000 necropsies performed on negro adults at a St. Louis City hospital we have found only 25 (12 men and 13 women) with acute myocardial infarction. Thus it appears that the racial characteristics or habits responsible for the low incidence of coronary arterial disease among negroes in Africa have been transferred to their descendants in America.—We are, etc.,

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Mortality from Coronary Disease

SIR,—I was very interested in Dr. W. J. Martin's figures showing the distribution in England and Wales of mortality from coronary disease (*Journal*, June 30, p. 1523). It would appear that the figures for rural districts were always lower than those for urban districts. Would it be fair to assume that more animal fat (butter, eggs, bacon, meat) is consumed in the former areas as compared with the latter? Do farmers and rural males smoke less than their counterparts in the cities? These are two important questions for which Dr. Martin may have the answers.—I am, etc.,

Hull.

L. I. HARDY.

Silicone Barrier Cream

SIR,—Your correspondent Mr. M. H. Payne (*Journal*, June 23, p. 1487) has referred to the high cost of silicone barrier creams, and gives a formula for such a product. Many such formulae have been published, most of which suffer the same disadvantage—that is, they are water washable emulsions. When applied to the skin the water content may evaporate, but because of the content of emulsifying agent the resultant film is readily dispersed in water. They are thus unable to give protection for very long against aqueous solutions. It seems to me to be fundamental that any film which is to protect the skin from aqueous solutions must be free from oil-in-water emulsifying agents. This entails the use of a transitory emulsifying agent—that is, one which breaks down on application to the skin. Such emulsifying agents are well known to the manufacturers of emulsion polishes.

The cost of 5s. per pound (0.45 kg.) is of course only the cost of the materials. It would be unfair to compare this cost with the total cost of manufactured silicone creams. This is especially true when one remembers that the labour cost for the manufacture of small quantities is very high.—I am, etc.,

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