VARICOSE VEINS PILOT SURVEY, 1966

BY

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The aetiology of varicose veins tends to be taken somewhat for granted by most; the standard surgical text-books state that the condition is inherited, is more common in those who stand for long hours, that the onset of the condition is commonly associated with pregnancy, that raised intra-abdominal pressure is a predisposing factor as are both thrombosis and phlebitis. In the present survey these and other aetiological factors have been studied in a hundred families chosen at random from the general population. The part played by each factor in the aetiology of the condition is discussed, and further research is outlined.

METHOD

A pilot survey to investigate the genetics and aetiology of varicose veins was carried out between August and October, 1966, in the City of Cardiff. One electoral ward of the city was randomly selected and from the electoral roll one hundred *propositi* were picked at random; of these 88 were seen, seven refused, three had left the area, one was dead, and one man with two artificial legs was excluded. The first-degree relatives—parents, siblings, and children—of the *propositi* were examined if over 15 years of age and resident in the City of Cardiff; 201 (90%) first-degree relatives were seen, 17 refused, four were not traced, and one died during the survey. Seventy-six families of the total of 88 were seen in their entirety. An analysis of the population studied is given in Table I.

The *propositi* were visited, appointments were made, and their first-degree relatives were listed;

it was however found necessary to check this list with other members of the family as the survey proceeded in order to obtain a complete tally, as some of the *propositi* tended to protect their families by omitting the names of the elderly, infirm, or awkward. Two hundred and seventeen of the subjects were seen at the central clinic and 72 at home. At the centre subjects were seen under approximately constant conditions, but the conditions in the homes varied considerably. In any future work as many subjects as possible should be seen at a centre, where the room temperature can be kept constant; it is also necessary to standardize the amount of physical exercise carried out by the subject immediately before the examination of the legs, as action of the calf pump has a marked effect on the prominence of the leg veins (Cockett, 1958).

The questionnaire was designed to cover those facts most commonly sought in the taking of a history from a patient at a varicose vein clinic. Age, weight, and height were recorded, a full occupational history was taken, particular enquiries were then made into any job that had entailed either lifting heavy objects or standing still in one place for more than half the working day, for a year or more. There was no way of assessing the accuracy of these statements, but it seems probable that the replies given would be somewhere near the truth, as a detailed occupational history was taken from the time of leaving school; after that was completed, enquiries were made about any heavy lifting or long standing that each particular job might have involved. A detailed family history of varicose veins was taken, and specific enquiries were made into the presence or absence of varicose veins in the subjects' parents, brothers, and sisters, but by an oversight no enquiries were made about their children. The replies were recorded as Yes, No, or Not Known; the last group (57 replies) was excluded from the analysis.

A past history was taken of any surgical operations; these were sub-divided into abdominal, pelvic, and other, and the length of time the subject had been kept in bed was noted. A past history was

TABLE I
POPULATION

Group	Total	Seen		Refused		Left Area		Dead	
		No.	%	No.	%	No.	%	No.	%
<i>Propositi</i>	100	88		7+1*		3		1	
First-degree relations	223	201	90.0	17	7.5	4	2.0	1	0.5

Note: *Excluded two artificial legs.

also taken of any illness that had kept the subject in bed for up to 1, 2, or 3 months. A detailed enquiry was made into any previous damage to the legs, the subject being asked specifically about bruises, sprains, fractures, and other leg injuries, operations, immobilization in plaster of Paris, and manipulations of the leg or foot. Finally the subject was asked whether there was a past history of phlebitis or thrombosis; if a history of phlebitis was given, he was asked if the leg had been swollen at that time, and if this had been the case the condition was coded as thrombosis.

In an examination of a random sample of the general population it was necessary to ask each subject if he considered he had varicose veins. If the answer was yes, he was then asked at what age the veins had first been noticed; the replies to this question would probably be more accurate in the case of the younger subjects who would be able to remember more easily the appearance of varicose veins in the fairly recent past, whereas in the case of the middle-aged and elderly the date of this often trivial event would have become lost in the mists of time. Subjects were also asked whether the veins had been treated with elastic stockings, crepe bandages, injections, surgery, or any other treatment; with the exception of these two sections the questionnaire was administered complete to every subject.

The presence or absence of constipation, chronic cough, and dysuria were asked for, but the questions used were too simple to obtain any useful information. The subject was also asked if he had had piles either in the past or at present. Direct questions were asked to find out if the subject had noticed the presence of prominent veins, aching, or itching of the legs, swollen ankles, night cramps in the legs, leg rashes or ulcers, or any other complaints.

The subject was then examined, standing up, for the presence or absence of varicosities.

The examinations were carried out by one observer. The practical difficulty was to arrive at a sound working definition of clinical varicose veins. Arnoldi (1957) defined varicose veins as 'any dilated, tortuous, and elongated subcutaneous veins of the leg, irrespective of size'. This definition is quite satisfactory for a clinician working in a vein clinic, but it does not enable a clear-cut division to be made between normality and those varicosities of the veins which, although clearly visible, have not been noticed by the subject and cause no inconvenience. In the analysis of this survey three categories were used: first, those with no complaint of varicose veins and with none visible on examination; secondly, those with varicose veins visible to the observer and in some instances noticed by the subject (subjects who complained of prominent veins were placed in the second category if the veins were associated with only one symptom); thirdly, those with varicose veins noticed by both the subject and the observer which were associated with two or more other symptoms (subjects with signs of venous insufficiency but with only one symptom in addition to prominent veins were placed in this category). These three categories will be referred to as (A) no veins, (B) non-clinical varicose veins, and (C) clinical varicose veins.

RESULTS

Table II shows that the incidence of clinical varicose veins increases steeply with age and that women are affected much more commonly than men (in the ratio of about three to one).

The histories of varicose veins in the family, given by each member, when compared with the clinical findings are of considerable interest. In this particular analysis (Table III), all veins considered by the subject as varicose are classed as such, irrespective of the number of symptoms

TABLE II
AGE AND SEX INCIDENCE OF VARICOSE VEINS

Sex	Group*	Age (years)						Total
		15—34		35—54		55+		
		No.	%	No.	%	No.	%	
Male	A	33	71.7	26	61.9	22	53.6	40 } 8 } 48
	B	12	26.1	14	33.3	14	34.1	
	C	1	2.2	2	4.8	5	12.2	
	Total	46	100.0	42	100.0	41	99.9	129
Female	A	33	75.0	21	39.6	21	33.3	60 } 25 } 85
	B	8	18.2	21	39.6	31	49.2	
	C	3	6.8	11	20.7	11	17.4	
	Total	44	100.0	53	99.9	63	99.9	160

A = no varicose veins; B = non-clinical varicose veins; C = clinical varicose veins.

TABLE III
QUESTIONNAIRE REPLIES COMPARED WITH CLINICAL FINDING

Reply	Correct, borne out by Clinical Findings		Not borne out by Clinical Findings		Total No.
	No.	%	No.	%	
With varicose veins	76	52.0	71	48.0	147
Without varicose veins	416	93.0	32	7.0	448
Total	492		103		595

$$\chi^2 = 128.11; P < 0.005$$

arising from them. This has led to the addition of 14 men and 19 women to those already classified as having clinical varicose veins. There were 595 possible observations: 68 on fathers, 86 on mothers, 195 on brothers, and 246 on sisters. Of these, 147 were on subjects who considered that they had varicose veins and 448 on subjects who considered they did not have varicose veins.

In those with varicose veins, 52% of the observations by the rest of the family proved to be correct and 48% did not, while in those without varicose veins 93% were correct and 7% were not.

The familial findings (Table IV) in this pilot survey were inconclusive because of the small number of families studied.

TABLE IV
FAMILIAL FINDINGS

Propositi	With Clinical Varicose Veins (7)	Without Clinical Varicose Veins (81)	Total
Relatives with clinical veins	3	26	29
Relatives with non-clinical veins	5	52	57
Relatives without varicose veins	5	110	115
Total	13	188	201

$$\chi^2 = 1.26; 0.5 > P > 0.25$$

TABLE V
HEAVY LIFTING

Group*	Males				Females			
	Heavy Lifting		No Heavy Lifting		Heavy Lifting		No Heavy Lifting	
	No.	%	No.	%	No.	%	No.	%
A	30	49.0	51	75.0	7	24.0	68	52.0
B	26	43.0	14	21.0	17	59.0	43	33.0
C	5	8.0	3	4.0	5	17.0	20	15.0
Total	61		68		29		131	

$$\chi^2 = 9.190 \quad P < 0.05$$

*As in Table II.

$$\chi^2 = 8.151 \quad P < 0.05$$

Work involving heavy lifting was significantly related to the presence of varicose veins both for men and for women (Table V). However, work involving long hours of standing did not appear to be related to the development of varicosities. Those who gave a history of piles, either in the past or the present, tended to be more prone to varicose veins, though the results did not attain significance.

The effect of parity on the development of varicosities is presented in Table VI. Although there is a trend towards an increasing liability to varicose veins in women who have had four or more children, the difference is not significant.

There was some suggestion that pelvic operations in women may play a part in the development of varicosities, but the results were not significant. Other operations or a history of previous leg pathology did not appear to predispose towards varicosities.

The symptoms noticed by the subjects are analysed in Table VII. The leg symptoms of prominent veins, aching, itching, swollen ankles, night cramps, leg rashes, and ulcers serve by their multiplicity as reminders of the many effects varicose veins can have, but the fact that 33% of men and 50% of women without varicose veins also complained of these symptoms emphasizes that such complaints are common to many other conditions. Among those without varicose veins, 12% of men and 32% of women complained of aching legs, 6% of men and 21% of women complained of swollen ankles, and 19% of men and 25% of women complained of night cramps. In short, no single symptom or collection of symptoms is pathognomic of varicose veins, with the exception of the visibility of varicosities.

Of the men with clinical varicose veins 50% had symptoms in both legs, the other 50% being equally divided between the right and left legs. Of the women, 72% had bilateral symptoms, 21% had symptoms in the left leg only and 7% in the right only.

TABLE VI
RELATIONSHIP BETWEEN PARITY AND VARICOSE VEINS

Group*	0		1		2		3		4		Total
	No.	%	No.	%	No.	%	No.	%	No.	%	
A	23	66	16	46.0	15	42.0	12	43.0	9	35.0	75
B	9	26	15	43.0	16	45.0	9	32.0	11	42.0	60
C	3	9	4	11.0	5	13.0	7	25.0	6	23.0	25
Total	35		35	100.0	36	100.0	28	100.0	26	100.0	160

$$\chi^2 = 10.220 \quad 0.20 < P < 0.30 \quad * \text{As in Table II.}$$

TABLE VII
FREQUENCY OF SYMPTOMS IN THE THREE GROUPS

Group*	With Symptoms		Prominent Veins		Aching		Itching		Swollen Ankles		Night Cramps		Varicose Eczema		Ulcer		Total in Group	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Males																		
A	21	33	†1		10	12	6	7	5	6	15	19	0	0	0	0	81	100
B	24	60	3	7.5	15	38	3	7.5	2	5	11	28	1	0	0	0	40	100
C	8	100	8	100	6	75	2	25	4	50	5	63	1	12.5	1	12.5	8	100
Total	59		12		31		11		11		31		2		1		129	
Females																		
A	38	50	0	0	24	32	3	4	16	21	19	25	0	0	0	0	75	100
B	60	100	8	13	19	32	4	7	21	35	24	40	1	0	0	0	60	100
C	25	100	25	100	21	84	10	40	22	85	11	44	2	8	2	8	25	100
Total	123		33		64		17		59		54		3		2		160	

*As in Table II. †No varicose veins visible on inspection.

The skin signs of oedema, induration, pigmentation, eczema, and varicose ulcer are significantly more common in those with varicose veins than in those without. In this survey ankle flare was seen in 40% of men and 19% of women without varicose veins or any signs of venous insufficiency, ankle flare being defined as the presence of 'a collection of tiny veins situated on the inner side of the foot and ankle' (Arnoldi, 1958a). The sign would probably have more clinical significance if it were considered to be present only when the collection of tiny veins has become both dilated and tortuous (Cockett and Jones, 1953).

The analysis of the distribution of varicose veins shows that both long and short saphenous veins are equally affected and that there is no significant difference in the distribution of varicosities between the right and left legs; 59% of non-clinical and clinical varicose veins are bilateral, 15% are in right legs, and 26% are in left legs. If those with bilateral varicose veins are excluded from the calculation, the difference between the incidence of varicosities in the right and left legs is not significant; 15 of 20 men and 21 of 36 women had involvement of the left leg only. Table VIII gives the results of a study of observer variation

TABLE VIII
VARICOSE VEINS OBSERVER VARIATION IN SIGNS AND SYMPTOMS
TWENTY PATIENTS WITH VARICOSE VEINS: TWO OBSERVERS

Percentage Agreement—Number in which agreement was reached in parentheses.

0-50 Per cent.	51-75 Per cent.	76-100 Per cent.
Which veins involved (6)	Cough impulse. Time in which veins became tense on standing (11)	Eczema. Aching. Ankle swelling. Menstrual pain (16)
(Agreement on long saphenous involvement reached in 15, but in 9 of these foot or ankle also considered to be involved by one observer)	Ankle flare. Above knee tourniquet test (12)	Below knee tourniquet test (17)
Presence of perforators (10)	Deep valve incompetence (13)	Ankle oedema. Ulcer scar. Cramps (18)
	Positive Valsalva manoeuvre (15)	Tourniquet control mid-calf or lower leg. Pigmentation. Itching. No symptoms. No tourniquet control (19)
		Veins tense on standing. Presence of ulcer (20)

in the physical signs of 20 patients with varicose veins (Jones and Townsend, 1966). The considerable variation noted in the presence or absence of cough impulse, ankle flare, and perforators is of some interest, and the difficulties apparent in the anatomical classification of varicose veins are also brought out in this study. Agreement in more than 75% of patients was found in the history and in the skin signs.

DISCUSSION

"All agree that hereditary, endocrinal, occupational, and other factors are involved in the formation of varicose veins" (Orbach, 1964). This somewhat uncritical approach to the aetiology of varicose veins is common to many authors particularly those of the standard surgical text-books. When discussions on aetiology are studied, particularly those based on the analysis of data collected from the observation of series of patients, it is found that many well established beliefs are not supported by fact.

It has been generally assumed that varicose veins are inherited (Franklin, 1937; Duguid, 1951; Callander, 1952; Rose and Carless, 1952; Christopher, 1956; Treves, 1957). Davis (1957) cited different statistics to show that a hereditary tendency is present in 40 to 80% of patients with varicose veins. Pratt (1950) stated that 80% of patients with varicose veins had one or both parents with the condition. Various authors have given results of personal series; Larson and Smith (1943) found that 43% of varicose veins patients gave a positive family history and Sherman (1964) found that 97% gave a positive family history.

King (1950) discussed the genesis of varicose veins and mentioned that these were often found in members of the same family, but pointed out that in view of the frequency with which they were found in the general population, such a family incidence would be expected. Wright (1960) wrote that varicose veins were so common that practically every patient could show a family history of them; this makes it difficult to establish the importance of any hereditary connexion.

When the family histories taken in the present series were compared with the presence or absence of varicose veins found in the first-degree relative on clinical examination, it was shown that when varicose veins were present and admitted to by the subject, the family history and clinical examination agreed in 52%, but when varicose veins were not present the chances of the first-degree relatives giving the correct history rose to 93%. A 52% chance of being right does not provide a sound

basis for any work, and must account in part for the great variation in positive family histories from 43 to 97%.

All the previous work on the genetics of varicose veins has been based on family histories; Curtius (1928) found inheritance to be dominant, Troisier and le Bayon (1937) found it to be recessive, and Ottley (1934) and Arnoldi (1958b) found it to be dominant in some and recessive in others.

In the present series it was not possible to reach any conclusions about the genetics of varicose veins. Seven *propositi* were found to have clinical varicose veins, and eight of their 13 first-degree relatives had varicose veins, three clinical and five non-clinical. Of 81 *propositi* without clinical varicose veins, 21 had 26 relatives with clinical varicose veins (18 non-clinical) and 30 without. The remaining 60 *propositi* had 34 first-degree relatives with non-clinical varicose veins and 80 without. If the proportions found in this study are representative of the general population, it will be necessary to examine a further 1,500 persons to determine whether varicose veins are inherited or not.

Many observers (Nicholson, 1927; Larson and Smith, 1943; McCausland, 1943; Payne, 1936; Davis, 1957; Haakenaasen, 1963; Drury, 1965, and Dick, 1966) consider varicose veins to be directly affected by pregnancy. Payne pointed out that the varicosities of pregnancy appear in the first three months, pointing to hormonal imbalance as the main cause rather than obstruction to venous return by the enlarged uterus. McCausland suggested that excess in circulating progesterone might favour the development of varicose veins as it relaxed the smooth muscle in the vein walls. King (1950) supported McCausland's hypothesis, and suggested that excess of circulating progesterone might lead to relaxation of the arterio-venous communications in the vein walls as well as of the vein walls themselves. Malan and Ruberti (1966) also suggested that, in special circumstances such as pregnancy, the opening of arterio-venous shunts might play a part in the development of varicose veins and they referred to work carried out in their own department in support of this, but Schraibman (1966) could find no positive proof of the presence of arterio-venous communications by blood oxygen saturation and dye dilution studies. Arnoldi (1957), in a personal series of 293 women, found a definite correlation between a late menarche and an increased incidence of varicose veins; he also showed that there were more pregnancies in the group with varicose veins but suggested that the transition from nulliparity to pregnancy was of greater importance than the number of pregnancies.

Prerovský, Linhart, Dejdar, Švejcar, Kruml, and Vavrejn (1962), from their series of a thousand patients with disorders of veins compared with a control group of persons of the same age, found no relationship between varicose veins and childbirth.

In the present series, in which it has been possible to compare those without varicose veins, those with non-clinical varicose veins, and those with clinical varicose veins, it was found that nulliparous women were less likely to develop varicose veins than those who had been pregnant, but that in the latter group the increased size of the family did not seem to affect the formation of varicosities.

Payne (1936) from his series of over a thousand patients and de Takats and Quint (1930) from their series of five hundred patients pointed out that the years of puberty, the early years of child-bearing, and the menopause were the commonest times for women to present with varicosities, the middle group being by far the largest of the three. In the present series, 28 women had clinical varicose veins: 20 first noticed them between the ages of 15 and 34, five between the ages of 35 and 44, and three after age 45. In this small series the early years of child-bearing were those when varicose veins most often appeared, but these figures do not support the idea that varicose veins also appear at puberty and at the menopause.

The sex ratio, particularly the changes in the ratio with age, is of interest. The results from three series are presented in Table IX and all show a similar increase in the number of women patients between 20 and 30 years of age.

Table X summarizes the varying sex ratios found by different authors. In all except the series of

Nicholson (1927), there are more women than men; in the present series, with its small number of cases of clinical varicose veins, the ratio was 1:3.5, eight men to 28 women.

Our results together with those of previous observers, suggest that endocrine imbalance and pregnancy influence the development of varices, but that other factors must also be important.

The beliefs that varicose veins are associated with long hours of standing and also with raised intra-abdominal pressure are some of the oldest in medicine, but so far have not been substantiated by any definitive studies. In the present series no connexion was found between long hours of standing and raised intra-abdominal pressure and the development of varicose veins, but in men work involving heavy lifting did have a significant influence.

Previous thrombosis and phlebitis have been shown to be a predisposing cause of some varicose veins. Gjörös (1956) found an incidence of 2.2% of deep venous thrombosis in a population of 15,980; and 26.7% of those with deep venous thrombosis developed varicose veins as late sequelae. Haakenaasen (1963), in his series of 284 patients with varicose veins, found 47 who gave a history of previous venous inflammation. Natali (1964) analysed 87,000 questionnaires on varicose vein patients, and found that 0.3% had a history of previous deep venous thrombosis, but that the range among the different series varied from 0.1 to 4%. Moore (1951), in a venographic study of leg valves in varicose vein patients with and without a history of deep venous thrombosis, found that none of those with a history of deep venous thrombosis had visible valves in the deep veins, and he concluded that the valveless state is the cause of the superficial varicose veins. Anning (1966) wrote that the commonest cause of failure of the calf pump was the valve destruction (and consequent retrograde flow of blood) that follows deep venous thrombosis and recanalization of veins. Cotton and Clark (1965), in an anatomical study of deep venous thrombosis, found that the commonest site of thrombus formation in the leg was in the venous sinuses of the soleus muscle.

Piulachs and Vidal-Barraquer (1953) put forward the hypothesis that all forms of varicose veins were due to multiple small arterio-venous channels. The work of Gius (1960) and of Haeger and Bergman (1963) supports this hypothesis, but conclusive proof is still needed before it can be accepted without reservation.

The careful studies of the anatomy and development of varicose veins carried out by Cotton (1961) are of great interest. Briefly, his findings were

TABLE IX
SEX RATIO, MALE: FEMALE, REPORTED BY DIFFERENT AUTHORS, BY AGE

Authors	Age Group (yrs.)			
	10-20	20-30	30-40	40-50
Bernsten (1927)	1:1	1:4	1:2	1:6
McPheters and Anderson (1946)	1:1	1:4	1:3	1:4
Present series (1968)	0:3	1:3.5	1:3	1:1

TABLE X
SEX RATIO REPORTED BY DIFFERENT AUTHORS

Authors	Male:Female Ratio
Nicholson (1927)	2:1.0
de Takats (1929); Dodd and Cockett (1956)	1:1.5
Larson and Smith (1943); Pratt (1950); Dodd (1964); Drury (1965)	1:2.0
Lofgren (1966)	1:2.5
Haakenaasen (1963)	1:3.0
Dick (1966); Present series (1968)	1:3.5
Payne (1936); Phillips (1964)	1:4.0

that varices were always found just distal to a valve, that the varix was asymmetrical, that normal valves often intervened between those with varices, that the saphenous vein itself became slightly elongated and cylindrically dilated, and that it was the superficial tributaries draining into the saphenous system that became elongated, dilated, and tortuous. He showed that the development of varicose veins was not related to the presence or absence of the terminal or subterminal valves in the long saphenous vein. The communicating veins became varicose, but the varicosities stopped abruptly at their junction with the deep veins. King (1950) found that the veins became locally dilated distal to a valve, and that there was medial hypertrophy, which later progressed to atrophy and sacculcation. Přerovský and others (1962) examined the histology of recently developed varicose veins and found that there was disorganization of the circular muscle in the media, and that the collagen content was decreased and the water content increased.

In the present series there were eight men with clinical varicose veins, and although this number is too small for statistical analysis it is worth noting that three gave a past history of fracture of the affected leg and three others gave a history of phlebitis of the leg in which varices had developed. In the 28 women with varicose veins, past fractures and deep venous thrombosis were uncommon; one had sustained a fractured leg and had deep venous thrombosis, one had had deep venous thrombosis, and two gave a past history of phlebitis, 22 had been pregnant, and two had nothing significant in their past history, one of whom had a varicose ulcer.

The anatomical site of varicose veins has been variously reported and the findings of seven series are summarized in Table XI. In all but two of the series over 50% of patients have had bilateral varicose veins, and there is no significant preponderance of varicose veins in the left leg. Dodd and Cockett

(1956) pointed out that the anatomical position of the varicose veins was of limited significance in deciding whether the defect was in the internal or external saphenous system; this bears out Kosiński's (1926) work on the anatomical variants of the short saphenous system.

In the present survey only 36 people with varicose veins were examined, and although it was possible to obtain some information into the aetiology of the condition this was in greater part of a negative nature, particularly with regard to the genetics. A further survey is planned with two hundred propositi all with varicose veins, and two hundred age- and sex-matched controls without varicose veins; it is planned to examine these four hundred people together with their siblings, and it is hoped to obtain more positive information from this, particularly into the genetics of the condition.

SUMMARY

In a pilot survey of 289 persons, 6% of men and 17% of women were found to have clinical varicose veins. A very considerable discrepancy became apparent between the history given of the presence or absence of varicose veins in each member of the family and the findings on clinical examinations of those same people. It is concluded that any genetic study must be based on clinical examination of each member of the family and that, as varicose veins occur in approximately 12% of the population, a large sample would need to be examined before any conclusions could be drawn. Heavy lifting in men and pregnancy are the only two factors having any significant relationship to the formation of varicose veins, although previous leg fractures and phlebitis are probably contributory factors in men.

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TABLE XI

SIDE AFFECTED REPORTED BY DIFFERENT AUTHORS

Authors	Date	No. of Patients	Side Affected					
			Right		Left		Both	
			No.	%	No.	%	No.	%
Nicholson	1927	112	13	12.0	19	17.0	80	71.0
Berntsen	1927	179	7	3.9	6	3.4	166	93.0
Dodd and Cockett	1956	327	118	36.0	134	41.0	75	23.0
Dodd and Wright	1959	343	121	35.0	113	33.0	109	32.0
Phillips	1964	200	37	18.5	37	18.5	126	63.0
Dick	1966	365	35	10.0	54	15.0	276	75.0
Present series	1968	36	5	14.0	12	33.0	19	53.0

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