RESULTS

(A) HISTOLOGICAL OBSERVATIONS

(1) Hx. & E. Stain

a- Control Group

Normal volunteers skin showed that the epidermis was thin and composed of keratinized stratified squamous epithelium mainly formed of keratinocytes. The deepest epidermal layer was made up of a single layer of low columnar cells with deeply-stained oval basal nuclei and deeply basophilic cytoplasm. This layer represented the stratum germinativium (Fig.5).The second layer was formed of 2 to 3 layers Of polyhedral cells with round central nuclei and basophilic cytoplasm this layer represented the prickle cell layer (Fig.6). The third layer, called the granular cell layer, was composed of discontinuous layer of flat shaped cells with flat nuclei and their cytoplasm contained keratohyalin granules (Fig.6).The stratum lucidum was absent. The most superficial layer was very thin and was composed of acidophilic horny scales (squames), the nuclei were absent and the cytoplasm was replaced with keratin. This layer

(Fig.5) A photomicrograph of a skin section obtained from a normal volunteer showing the epidermal cell layers. Arrow indicates the basal cell layer and H represents the horny layer.

(Hx & E stain,Proj. 10x , Obj.40x).

(Fig.6) A photomicrograph of a skin section obtained from a normal volunteer showing the prickle cell layer and granular layer of the epidermis
(Hx & E stain,Proj. 10x , Obj. 100x)

represented the horny layer or stratum corneum (Fig.5).

The dermis was made up of two layers of connective tissue (C.T.) that merged with each other. The papillary layer, the outer layer, included the ridges and papillae that protruded into the epidermis. The dermal papillae were low, broad and few in number and formed of loose C.T. contained fine collagenous fibers and C.T. cells nuclei, mainly of fibrocytes (Fig.7). The reticular layer, however, consisted mainly of coarse, dense and interlacing collagenous fibers and less C.T. cells.The dermis contained hair follicles and sebaceous sweat gland (Fig.7).

b- Psoriatic Group

Skin samples obtained from psoriatic patients showed that there was thickening of the epidermis (acanthosis). The epidermal ridges showed regular elongations and extended downward to a uniform level. The ridges were slender in their outer portion and showed clubbing in their inner portion. Also, the epidermal ridges branched and the neighbouring ridges were coalesced at their bases (Fig.8). The dermal papillae were elongated and oedematous and the tips were dilated (Fig.8). There was thinning of the suprapapillary portions of the stratum Malpighii and the epidermis over the tips of the papillae was reduced to 2-3 cells thick (Fig.9). The stratum lucidum was also absent. The horny layer

(Fig.7) A photomicrograph of a skin section obtained from a normal volunteer showing the reticular and papillary layers of the dermis containing cross sections of hair follicles (F), and sebaceous glands (arrows). (Hx & E stain,Proj. 10x, Obj. 10x).

(Fig.8) A photomicrograph of a skin section obtained from a psoriatic patient showing regular elongation of he epidermal ridges, with thickening (clubbing) in their inner portion and the neighbouring ridges coalesced(arrow) and branched at their bases The dermal papillae were elongated and the tips dilated. (Hx & E stain, Proj. 10x, Obj. 10x)

(Fig.9) A photomicrograph of a skin section obtained from a psoriatic patient showing parakeratosis and thinning of the suprapapillary portion of the stratum Malpighii.
(Hx & E stain , Proj. 10x, Obj. 40x).

consisted of parakeratotic cells splits and air spaces appeared in the parakeratotic regions and the granular layers were absent (Figs.9,10).In some specimens there was thickening of the horny layer and increase in the granular layer (Hyperkeratosis) (Fig. 11). There was accumulation of pyknotic nuclei of neutrophils (Munro' microabscesses) located within the horny layer (Fig.12).

(2) Van Gieson's stain :

a- Control Group

Van Gieson's stain showed that, the epidermis was thin and the nuclei of epidermal cells appeared brown-black to black (Fig.13).

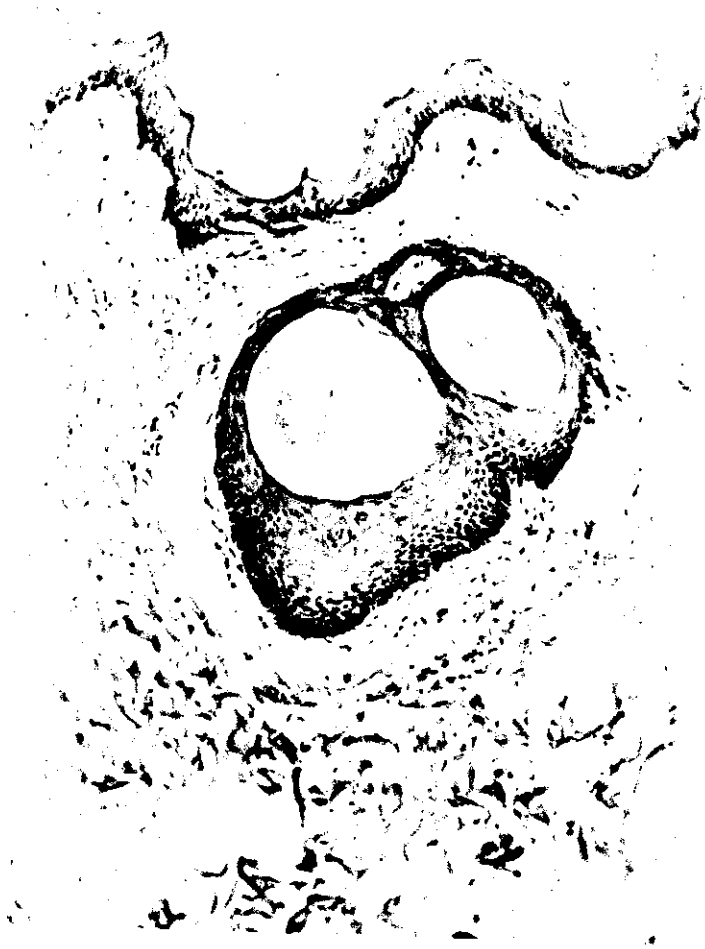
The dermis was made up of two layers of connective tissue (C.T) that merged with each other. The outer layer, the papillary layer, included ridges and papillae that protruded into the epidermis. The dermal papillae appeared low, few in number and broad. This layer was formed of loose C.T, contained fine collagenous fibers which stained red, and C.T. cells mainly fibrocytes. The nuclei of fibrocytes appeared oval in shape and stained brown-black to black (Figs.14,15). The reticular layer consisted of coarse, dense and interlacing collagenous fibers which stained red and less numerous fibrocytes cells (Figs. 14, 16).

(Fig.10) A photomicrograph of skin section obtained from a psoriatic patient showing parakeratosis and absence of the granular layer.
(H× & E stain , Proj. 10× Obj. 100×)

(Fig.11) A photomicrograph of skin section obtained from a psoriatic patient showing hyperkeratosis and thickening of the granular layer .
(Hx & E stain ,Proj. 10x Obj. 100x).

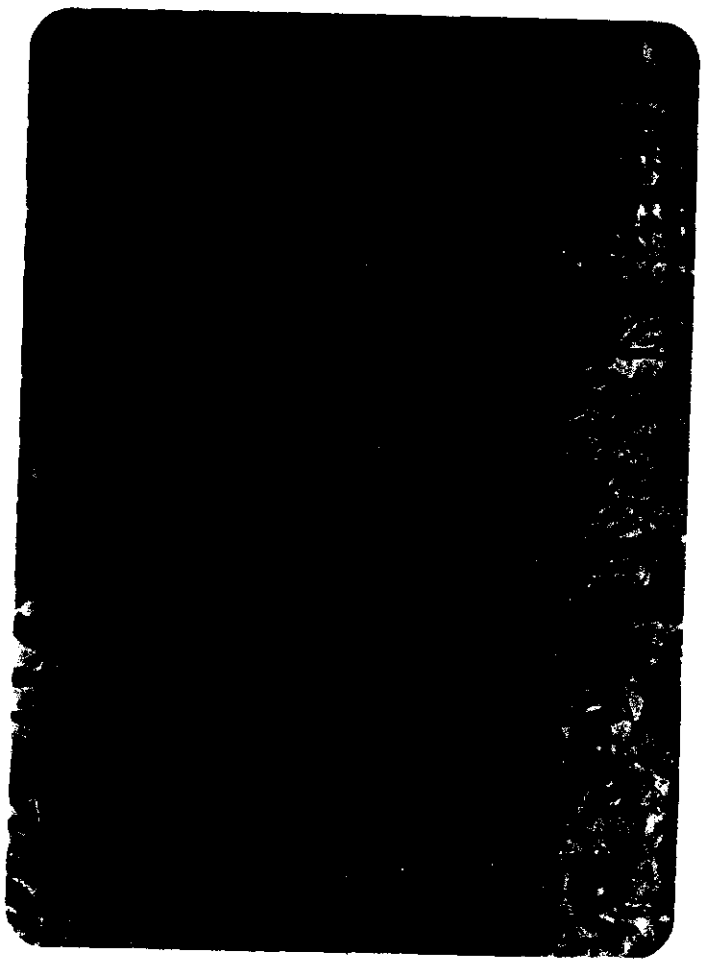
(Fig.12) A photomicrograph of skin section obtained from a psoriatic patient showing accumulation of pyknotic nuclei of neutrophils (Munro microabscess) within the stratum corneum

(H x & E stain, Proj.10 X, obj.100 x)



(Fig.13) A photomicrograph of a skin section obtained from a normal volunteer showing the nuclei of epidermal cells

(Van Gieson's stain, Proj. 10 X, Obj.10 X)



(Fig.14) A photomicrograph of skin section obtained from normal volunteer showing the dermal papillae (P), collagenous fibers and fibroblast nuclei in both papillary and reticular layers of the dermis(arrows) (Van Gieson's stain,proj. 10x, Obj. 40x)

(Fig.15) A photomicrograph of a skin section obtained from normal volunteer showing the papillary layer of the dermis, collagenous fibers and the fibroblast nuclei (arrow).
(Van Gieson's stain, proj. 10x, Obj. 40x)

(Fig.16) A photomicrograph of a skin section obtained from a normal volunteer showing the reticular layer of the dermis. (Van Gieson stain, Proj. 10x, Obj.40x).

b- Psoriatic Group

There was thickening of the epidermis(acanthosis) (Fig.17). The bundles of collagen fibers appeared more condensed and numerous fibroblasts nuclei were observed both in papillary and reticular layers (Figs.18,19,20).

(3) Methyl green pyronin :

a- Control Group

The nuclei of epidermal cells stained blue green and the cytoplasm stained red. The cytoplasmic RNA in the basal layer appeared more condensed and more granular than that of other epidermal layers. Also, the nuclear DNA was more condensed in the basal layer than in the superficial layers (Figs.21,22) .

b- Psoriatic Group

In the epidermis of psoriatic skin, the amount of DNA in the nuclei was increased in all epidermal cell layers which appeared less granular and more condensed compared to that of normal skin (Figs.23,24).Also there was increase in the amount of RNA of the cytoplasm which appeared as well, more condensed and less granular (Fig.25).

(B) HISTOCHEMICAL OBSERVATIONS

a- Control Group

After ATPase procedure, L .Cs. were stained brown with different morphological pictures. The cells appeared to have

(Fig.17) A photomicrograph of a skin section obtained from a psoriatic patient showing thickening of the epidermis and the bundles of collagen fibers appear more condensed

(Van Gieson's stain , ProJ. 10x Obj. 10x).

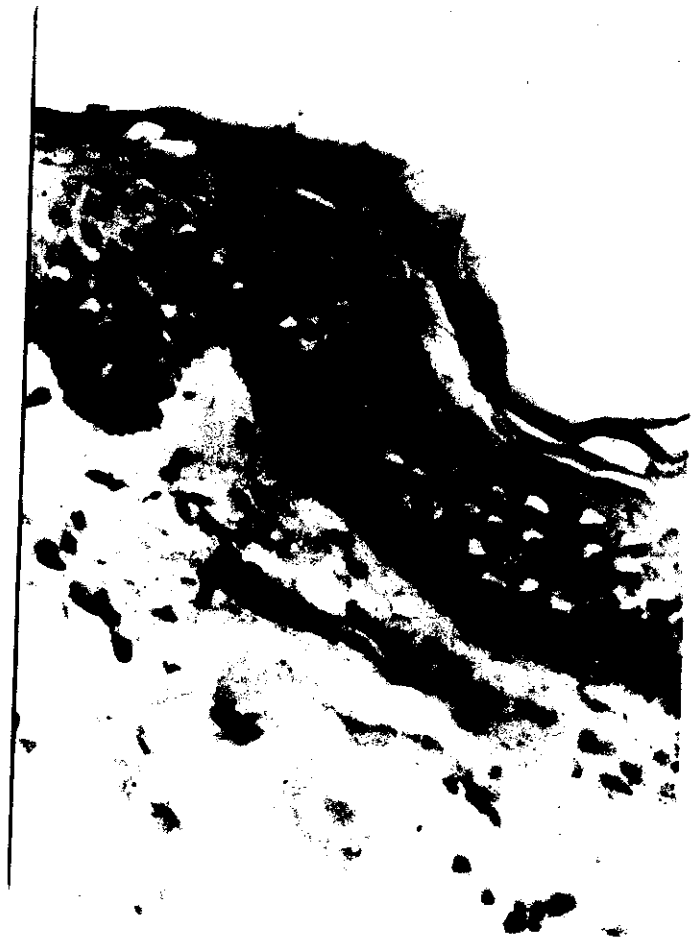
(Fig.18) A photomicrograph showing the papillary layer of dermis and the bundles of collagen fibers appear more condensed

(Van Gieson's stain, Proj. 10x Obj. 40x).

(Fig.19) A photomicrograph of a psoriatic dermis, showing numerous nuclei of fibroblasts in the papillary layer.

(Van Gieson's stain ,Proj. 10x Obj. 40 x)

(Fig.20) A photomicrograph of a psoriatic dermis showing a lot of fibroblasts nuclei in the reticular layer (Van Gieson's stain, Proj. 10x Obj. 40x).



(Fig.21) A photomicrograph of a skin section obtained from a normal volunteer.

(Methyl green pyronin stain, Proj. 10x Obj.40x.).

(Fig.22) A photomicrograph of a higher magnification of a skin section obtained from a normal volunteer.
(Methyl green pyronin stain , Proj. 10x Obj. 100x).

(Fig.23) A photomicrograph of a skin section obtained from a psoiatic patient showing cytoplasmic RNA and nuclear DNA.

(M.G.P stain,Proj. 10x Obj. 40x.)

(Fig.24) A photomicrograph of a psoriatic epidermis showing cytoplasmic RNA and nuclear DNA
(M.G.P stain ,Proj. 10x Obj. 100x)

(Fig.25) A photomicrograph of the epidermis of psoriatic patient showing increase of cytoplasmic RNA and nuclear DNA.

(M.G.P stain., Proj.10x Obj. 100x).

polygonal, oval or circular cell bodies (Fig.26) with cytoplasmic process forming a dendritic apperance (Fig.27).

b- Psoriatic Group

L.Cs. showed the same morphology, as in the normal skin.

(C) QUANTITATIVE RESULTS

1- Fibroblasts:-

a-Control group

the mean number of the fibroblasts in the dermis of the examined normal male skin was 106 $\pm$ 9.6 / mm^2, and of the examined normal female skin was 108 $\pm$ 8.3 / mm^2 (Tab.1). The difference between the two means was statistically non significant ($p > 0.05$).When the Observations of males and females were pooled together ,the mean number of fibroblasts in the control group was 107 $\pm$ 8.9 / mm^2 (Tab.1).

b-Psoriatic group

The mean number of fibroblasts in the dermis of the examined psoriatic male skin was 286.0 $\pm$ 17.3 / mm^2 and of the examined psoriatic female skin was 287 $\pm$ 15.4 / mm^2 (Tab.2). The difference between the two means was statistically non significant ($p > 0.05$). When the observations of males and females were pooled together,the mean number of fibroblasts in the psoriatic group was 287 $\pm$ 16.4 / mm^2 (Tab.2).

Statistical analysis of the mean numbers of fibroblasts in control dermis and the psoriatic dermis

(Fig.26) A photomicrograph of a skin section obtained from a normal volunteer showing that L. Cs. appear as polygonal or oval cells' body (arrow).
(ATPase stain, Proj. 10x, Obj. 100x).

(Tab.1) showing the number, the mean number and the standard deviation (S.D.) of fibroblasts in the dermis of the control group (Males & Females).

Sex	Case NO	No.of fibroblasts /mm^2			Individual mean of fibroblasts /mm^2	Grand mean of fibroblasts /mm^2	S.D.
		first slide	2nd slide	3rd slide			
MALES	1	100	129	125	118		
	2	78	100	135	104		
	3	59	120	110	96		
	4	108	110	80	99		
	5	98	95	85	92		
	6	88	90	120	99		
	7	110	130	110	117		
	8	90	100	120	103		
	9	150	90	80	107	106	±9.4
	10	100	110	130	113		
	11	105	69	89	88		
	12	120	130	100	117		
	13	130	110	89	110		
	14	115	125	100	113		
	15	130	120	100	117		
FEMALES	16	130	100	80	103		
	17	140	80	110	110		
	18	75	90	105	90		
	19	110	130	100	113		
	20	110	100	120	110		
	21	120	110	130	120		
	22	110	90	100	100		
	23	120	125	110	118	108	±8.3
	24	75	90	140	102		
	25	90	130	120	113		
	26	95	75	120	97		
	27	140	110	80	110		
	28	108	98	110	105		
	29	105	115	100	107		
	30	120	120	110	117		
Total	30					107	± 8.9

revealed a highly significant difference (p <0.001)(Tab.3).

2 - L.Cs.

a-Control group

In the epidermis , L.Cs. appeared as intense continuous network in the suprabasal Malpighian layer (Figs.28,29).They were also observed in the external root sheaths of hair follicles (Fig.30).

The mean number of L.Cs.in the epidermis of the examined normal male skin was 447 $\pm$ 20.8 / mm^2 and of the normal female skin was 440 $\pm$ 18.7 / mm^2 (Tab.4).The difference between the two means was statistically non significant (p >0.05).When the observations of males and females were pooled together the mean number of L.Cs. in the epidermis of control group was 443 $\pm$ 19.9 / mm^2 (Tab.4).

In the dermis of normal skin no ATPase positive L.Cs. were seen (Fig.28) and they were confined to the ducts of sweat glands (Figs.31,32). Their mean number in the male dermis was 8 $\pm$ 2.4 / mm^2 and of the female was 9 $\pm$ 2.2 / mm^2 (Tab.5).The difference between the two means was statistically non significant (p >0.05).When the observations of males and females were pooled together the mean number of L.C.s in the dermis of the control group was 9 $\pm$ 2.3 / mm^2 (Tab. 5).

b-Psoriatic group

In the epidermis, in 20 cases (66.7%) L. Cs.were seen in

(Tab.3) Showing the mean number & the standard deviation of fibroblasts in the dermis of both control & psoriatic groups.

	Control	psoriatic	t	P
♂ $\bar{X}$ S.D	106 ± 9.6	286 17.3	16.4 *	<0.001
♀ $\bar{X}$ S .D.	108 8.3	287 15.4	39.1 *	<0.001
t^* P	0.3 △ >0.05	0.3 △ >0.05		
Total (♂&♀) $\bar{X}$ S.D.	107 8.9	287 16.4	59 *	<0.001

t = Student t test between control and psoriatic means

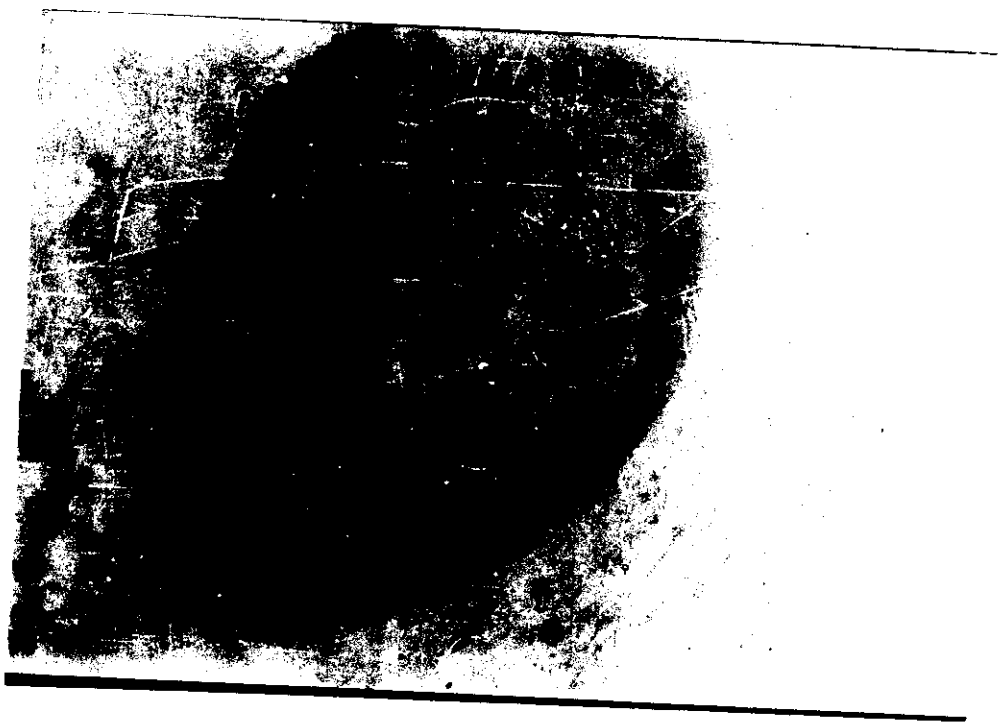
t^* = Student t test btween ♂ and ♀ means in both control and psoriatic groups

* = Significant difference

△ = Non significant difference

(Fig. 28) A photomicrograph of a skin section obtained from a normal volunteer showing the distribution of L.Cs. in the suprabasal Malpighian layer of the epidermis. Note the absence of L. Cs.in the dermis.
(ATPase stain, Proj.10x Obj.10x)

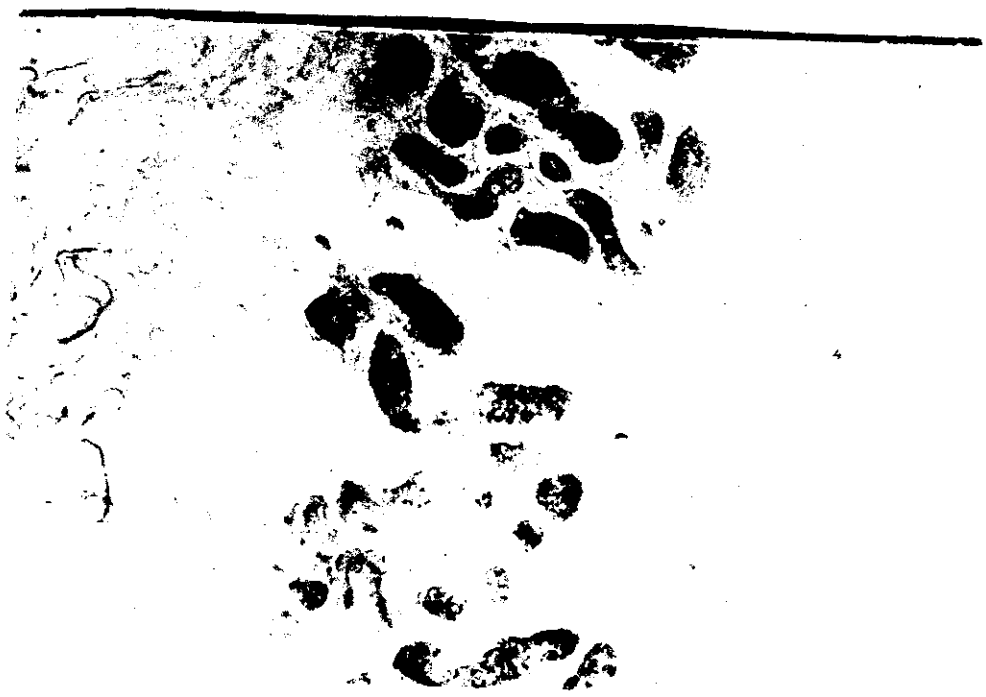
(Fig.29) A photomicrograph of a higher magnification of a skin section obtained from a normal volunteer showing the distribution of L. Cs in the suprabasal Malpighian layer of the epidermis. (ATPase stain, Proj. 10x, Obj. 40x).



(Fig.30) A photomicrograph of a skin section obtained from a normal volunteer showing the distribution of L. Cs in the external root sheath of a hair follicle. (ATPase stain,Proj. 10x Obj. 40x)

(Tab. 4) showing the number, the mean number and the standard deviation of L.Cs. in the epidermis of the control group (Males &Females).

Sex	Case number	Number of L.Cs./mm^2 first slide	2nd slide	3rd slide	Individual mean No of L.Cs./mm^2	Grand mean No of L.Cs/mm^2	Standard deviation
MALES	1	458	460	425	448	447	±20.8
	2	490	410	450	450		
	3	500	420	450	457		
	4	420	400	520	447		
	5	430	460	410	433		
	6	360	410	450	407		
	7	490	370	390	417		
	8	460	530	420	470		
	9	500	450	430	460		
	10	510	490	419	473		
	11	460	500	490	483		
	12	430	410	460	433		
	13	420	460	480	453		
	14	400	460	400	420		
	15	520	430	420	457		
FEMALES	16	430	450	420	433	440	±18.7
	17	410	440	500	450		
	18	390	490	430	437		
	19	390	385	480	418		
	20	450	460	480	463		
	21	480	410	420	437		
	22	390	470	430	430		
	23	400	480	420	433		
	24	510	490	480	493		
	25	460	400	430	430		
	26	430	450	410	430		
	27	490	420	450	453		
	28	440	500	390	443		
	29	460	400	410	423		
	30	470	400	420	430		
Total	30					443	± 19.9



(Fig.31) A photomicrograph of a skin section obtained from a normal volunteer showing that L.Cs appear in the ducts of sweat glands(arrows).
(ATPase stain, Proj. 10x, Obj. 10x).

(Fig.32) A higher magnifiction of a skin section obtained from a normal volunteer showing that L. Cs appear in the ducts of sweat glands.
(ATPase stain,Proj. 10x , Obj. 100x.)

(Tab.5) showing the number, the mean number and the standard deviation of L. Cs. in the dermis of the control group.

(Males & Females)

Sex	Case number	Number of L.C/mm²			Individual mean No of L.Cs/mm²	Grand mean No of L.Cs/mm²	Standard deviation
		first slide	2nd slide	3rd slide			
MALES	1	14	15	11	13	8	±2.4
	2	13	7	8	9		
	3	7	8	10	8		
	4	13	11	6	10		
	5	4	6	5	5		
	6	8	4	3	5		
	7	6	17	11	11		
	8	8	7	5	7		
	9	16	14	5	12		
	10	5	8	5	6		
	11	3	4	15	7		
	12	8	6	10	8		
	13	4	7	10	7		
	14	10	7	6	8		
	15	12	13	6	10		
FEMALES	16	10	12	8	10	9	±2.2
	17	3	6	4	4		
	18	7	11	16	11		
	19	9	10	12	10		
	20	6	9	11	9		
	21	14	10	6	10		
	22	15	8	10	11		
	23	9	7	6	7		
	24	15	13	8	12		
	25	5	9	6	7		
	26	4	11	5	7		
	27	7	9	10	9		
	28	11	10	10	10		
	29	8	6	10	8		
	30	3	8	5	5		
Total	30					9	± 2.3

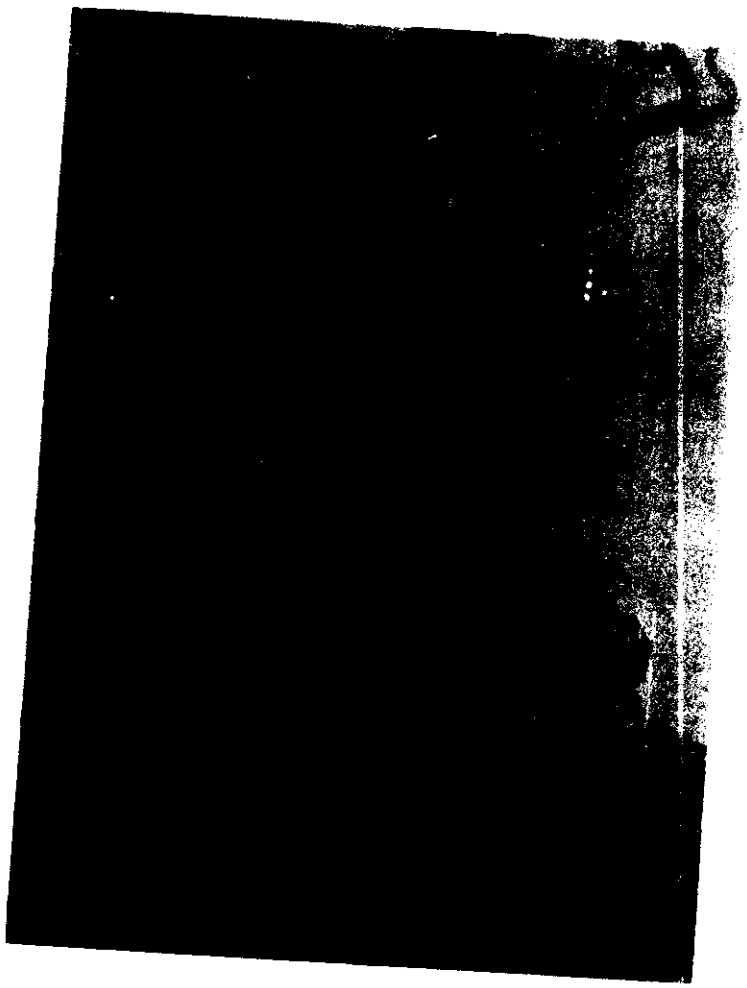
only segments of epidermal skin while the rest segments of the epidermis were totally devoid of such cells (Figs.33,34).

In the remaining 10 cases (33.3%) L.Cs. appeared as dense clusters or as poorly demarcated foci of clusters mostly above the dermal papillae, in the papillae themselves and or in all epidermal layers (Figs.35,36).Also,L.Cs. appeared in the stratum corneum (Fig.37) and L.Cs were conserved around hair follicles (Figs .38,39).

The mean number of L.Cs. in the epidermis of the examined psoriatic male skin was 95.0 ± 18.9 /mm^{2}and of the psoriatic female skin was 95.0 ± 19.7 /mm^2 (Tab. 6).The difference between the two means was statistically non significant ($P > 0.05$). When the observations of males and females were pooled together, the mean number of L.Cs.in the epidermis of the psoriatic group was 95 ± 19.3/mm^2 (Tab.6). The statistical analysis of the difference between the means of L.Cs. in control epidermis and in psoriatic epidermis revealed a highly significant difference($P < 0.001$)(Tab.7).

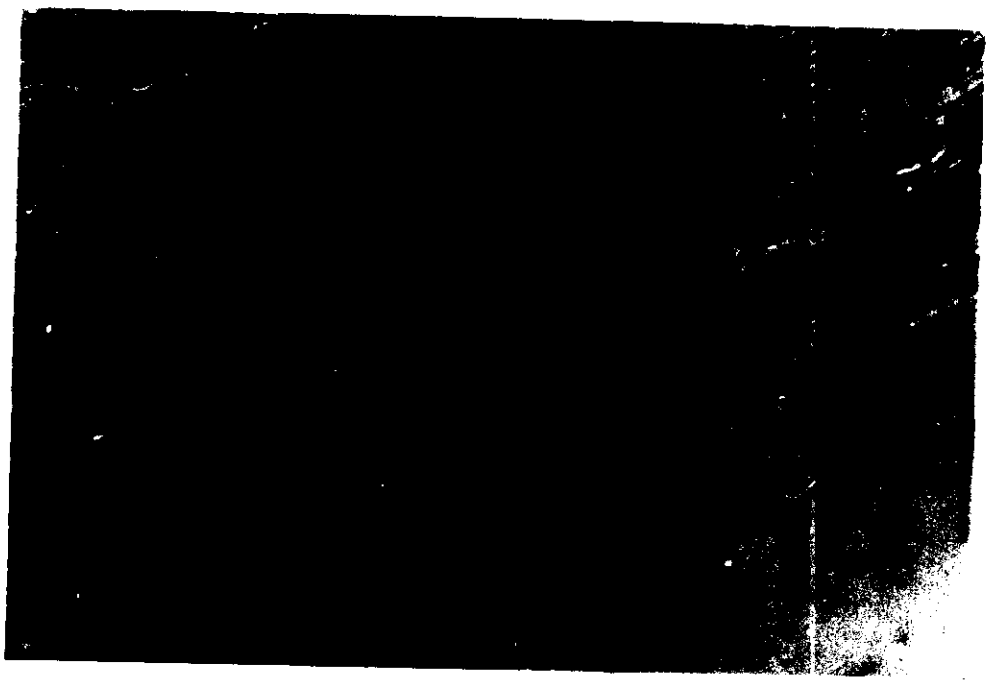
In the dermis,L.Cs. appeared in ducts of sweat glands and in addition to that in 10 cases out of 30 cases examined they appeared as groups or clusters either in the dermal papillae (Figs.40,41) or deeper in the dermis (Fig.42).

The mean number of L.Cs. in the dermis of the examined psoriatic male skin was 17 ± 15.4 / mm^2 and of the examined

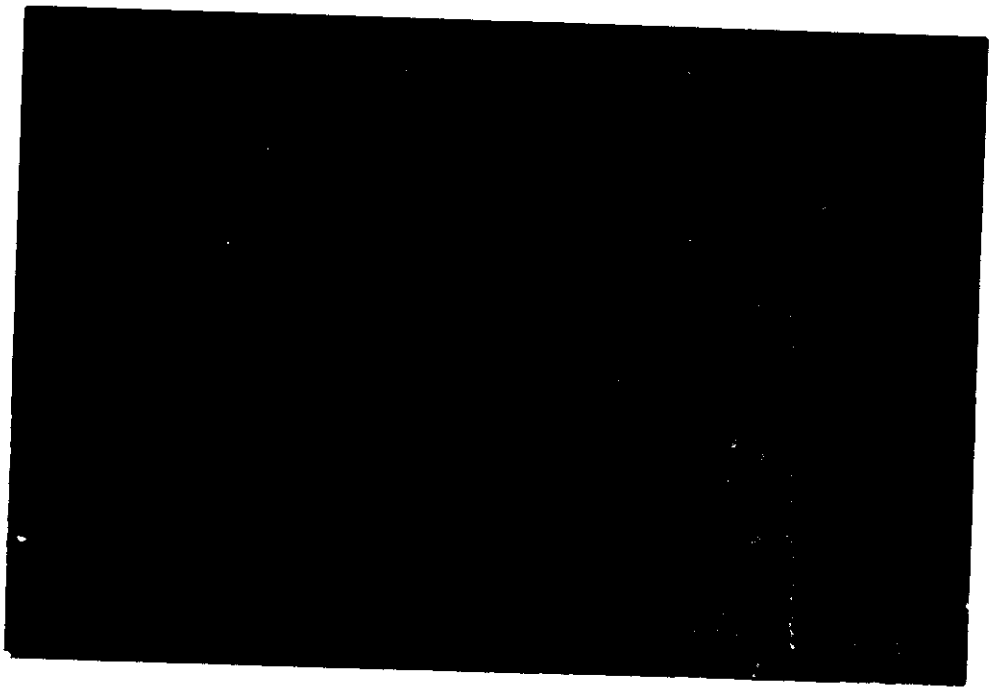


(Fig. 33) A photomicrograph of a skin section obtained from psoriatic patient showing the distribution of L. Cs in the epidermis, large segments of the epidermis are totally devoid of L. Cs and in other area L. Cs are seen.

(ATPase stain ,Proj. 10x, Obj. 10x)



(Fig.34) A photomicrograph of a skin section obtained from a psoriatic patient showing that large segments of the epidermis are totally devoid of L. Cs.
(ATPase stain,Proj.10x, Obj. 40x)

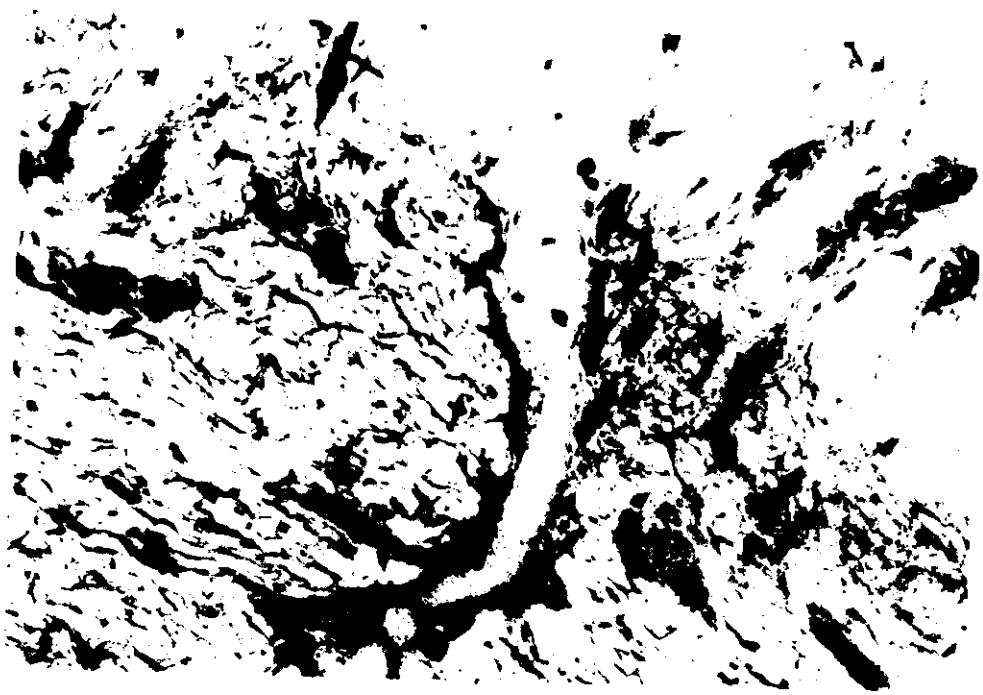


(Fig. 35) A photomicrograph of a skin section obtained from a psoriatic patient showing that L. Cs are present as dense clusters above the dermal papillae, in the dermal popillae, in all layers of the epidermis and in the dermis.

(ATPase stain, Proj. 10x, Obj. 5x)

(Fig.36) A photomicrograph of a psoriatic epidermis showing that L. Cs are present as dense clusters at all levels of the psoriatic epidermis and in dermal papillae .
(ATPase stain, Proj. 10x Obj. 40x).

(Fig.37) A photomicrograph of a psoriatic epidermis showing the presence of L. Cs in the stratum Corneum. (ATPase stain, Proj. 10x, Obj. 40x).



(Fig.38) A photo micrograph of a psoriatic skin showing that L. Cs present in groups in the dermal papillae and are conserved around hair follicle .
(ATPase stain . Proj. 10x, Obj. 40x)

(Fig.39) A photomicrograph of a higher magnification of psoriatic skin showing that L. Cs are Conserved around hair follicles

(ATPase stain ,Proj. 10x, Obj. 100x.)

(Tab.6) showing the number, the mean number and the standard deviation of L. Cs. in the epidermis of the psoriatic group (Males& Females)

Sex	Case number	Number of L.Cs/ mm^2			Individual mean No of L.Cs/mm^2	Grand mean No of L.Cs/mm^2	standard deviation
		first slide	2nd slide	3rd slide			
MALES	3	140	110	10	87	95	±18.9
	5	0	230	150	127		
	6	80	90	120	97		
	7	140	90	130	120		
	8	20	70	140	77		
	13	100	120	80	100		
	15	120	0	180	100		
	17	160	70	100	110		
	18	110	10	60	60		
	19	90	75	120	95		
	24	50	130	10	63		
	25	160	130	0	97		
	26	180	120	0	100		
	27	140	80	110	110		
	29	130	110	0	80		
FEMALES	1	180	110	10	100	95	19.7
	2	20	100	130	83		
	4	50	120	200	123		
	9	0	80	200	93		
	10	10	60	120	63		
	11	130	60	150	113		
	12	130	130	0	87		
	14	120	190	30	113		
	16	100	170	80	117		
	20	80	60	100	80		
	21	110	80	40	77		
	22	210	50	0	87		
	23	180	98	115	131		
	28	45	80	120	82		
	30	0	130	110	80		
Total	30					95	± 19.3

(Tab.7) Showing the mean number & the standard deviation of L.Cs in the epidermis of both control & psoriatic groups.

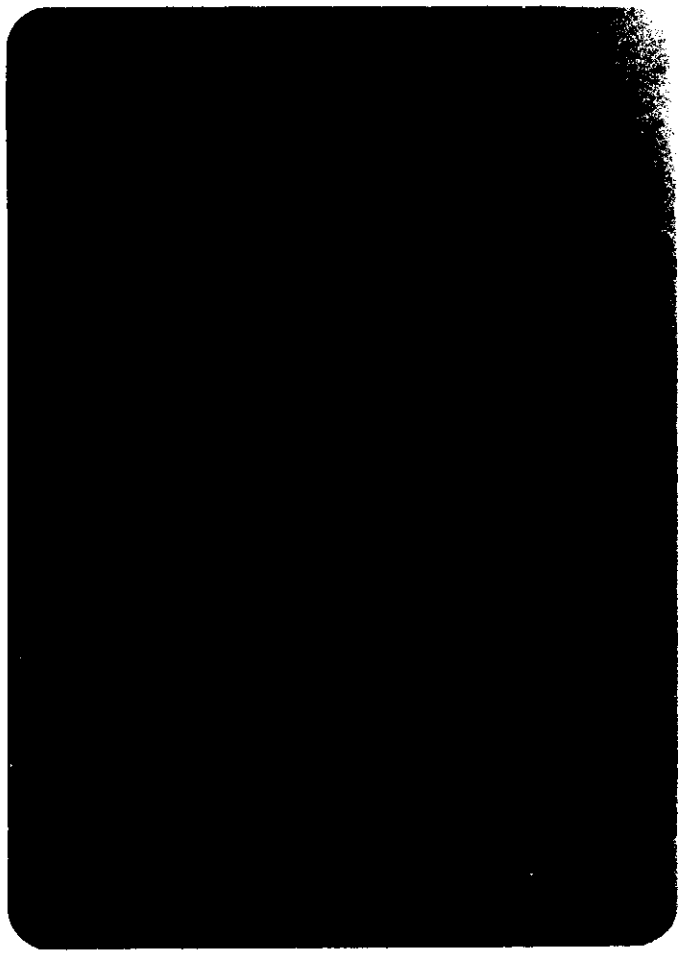
	Control	psoriatic	t	P
♂ $\bar{X}$	447	95	50.8*	<0.001
S.D	20.8	18.9		
♀ $\bar{X}$	440	95	49.2*	<0.001
S .D.	18.7	19.7		
t^*	1.5≏	zero≏		
P	>0.05	>0.05		
Total (♂&♀) $\bar{X}$	443	95	14.0*	<0.001
S.D.	19.9	19.3		

t = Student t test between control and psoriatic means

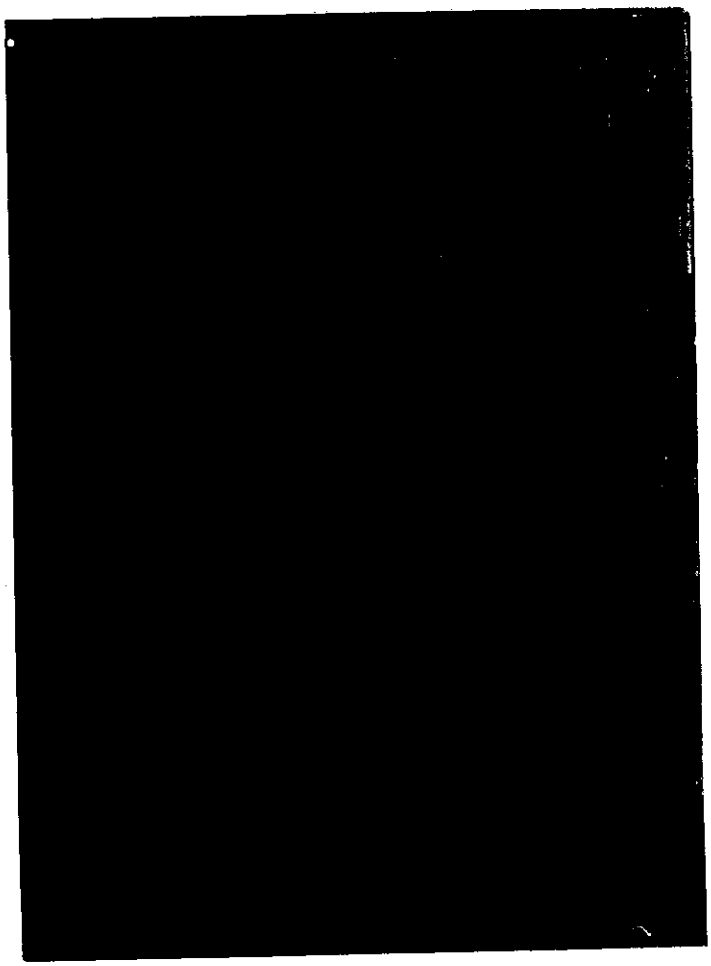
t^* = Student t test btween ♂ and ♀ means in both control and psoriatic groups

* = Significant difference

≏ = Non significant difference



(Fig.41) A higher magnification of psoriatic skin showing that LCs appeared in the dermal papilla.
(ATPase stain ,Proj. 10x, Obj.100x.)



(Fig. 42) A photomicrograph of the dermis of psoriatic skin showing L. Cs appear as clusters in the dermis (ATPase stain, Proj. 10x, Obj. 100x).

psoriatic female skin was 19 $\pm$ 17.5/mm^2 (Tab.8).There was no statistically significant difference between the two means (P >0.05).When the observations of males and females were pooled together the mean number of L.Cs. in the dermis of the psoriatic group was 18 $\pm$ 16.3 / mm^2 (Tab.8).

There was a statistically significant difference between the mean numbers of L.Cs. in the dermis of control and of psoriatic groups (P < 0.05) (Tab. 9). Totally the mean number of L.Cs. in the skin (epidermis and dermis) of control male was 455 $\pm$ 11.6 / mm^2 and of control female was 449 $\pm$ 10.4 / mm^2.Also,mean number of L.Cs. in the skin of psoriatic male was 112 $\pm$ 17.1 / mm^2 and of the psoriatic female was 114 $\pm$ 18.2 / mm^2.There was a highly significant difference between the mean number of L.Cs. in the skin of control male and psoriatic male (P < 0.001) and of the skin of control female and of psoriatic female (P <0.001).Also there was a highly significant difference between the mean number of L.Cs. in the skin of control and psoriatic groups (P <0.001) (Tab. 10).

(D) GENETIC RESULTS

Chromosomal analysis :

Control Group

The chromosomal analysis revealed that all normal males had 46 chromosomes with 44 autosomes and 2 sex chromosomes:

(Tab.8) showing the number, the mean number and the standard deviation of L. Cs. in the dermis of the psoriatic group. (Males & Females)

Sex	Case number	number of L.C/mm^2			Individual mean No of L.Cs/mm^2	Grand mean No of LCs/mm^2	standard deviation
		first slide	2nd. slide	3rd. slide			
MALES	3	8	3	5	5		
	5	6	8	4	6		
	6	10	15	5	10		
	7	4	7	10	7		
	8	50	40	20	37		
	13	10	12	6	9		
	15	7	13	12	11	17	±15.5
	17	6	3	5	5		
	18	90	40	20	50		
	19	4	5	8	6		
	24	40	50	30	40		
	25	9	6	10	8		
	26	11	13	7	10		
	27	14	5	6	8		
	29	20	30	60	37		
FEMALES	1	9	6	3	6		
	2	40	20	30	30		
	4	4	3	5	4		
	9	10	11	5	9		
	10	50	60	20	43		
	11	50	40	40	43		
	12	8	3	13	8		
	14	7	8	12	9		
	16	2	4	3	3	19	±17.5
	20	70	25	50	48		
	21	45	30	20	32		
	22	4	3	2	3		
	23	6	7	11	8		
	28	7	5	4	4		
	30	40	50	30	40		
Total	30					18	±16.3

(Tab.9) Showing the mean number & the standard deviation of L.Cs. in the dermis of both control & psoriatic groups.

	Control	psoriatic	t	P
♂ $\bar{X}$ S.D	8.0 2.4	17 15.5	2.2*	<0.001
♀ $\bar{X}$ S .D.	9 2.2	19 17.5	1.8*	<0.001
t^* P	0.3△ >0.05	0.5△ >0.05		
Total (♂&♀) $\bar{X}$ S.D.	9 2.3	18 16.3	2.1*	<0.001

t = Student t test between control and psoriatic means

t^* = Student t test btween ♂ and ♀ means in both control and psoriatic groups

* = Significant difference

△ = Non significant difference

(Tab.10) Showing the mean number & the standard deviation of L.Cs. in the skin (epidermis and dermis) of both control & psoriatic groups.

	Control	psoriatic	t	P
♂ $\bar{X}$	455	112	56*	<0.001
S.D	11.6	17.1		
♀ $\bar{X}$	449	114	59*	<0.001
S .D.	10.4	18.2		
t^*	0.5≏	0.3≏		
P	>0.05	>0.05		
Total (♂&♀) $\bar{X}$	452	113	49*	<0.001
S.D.	11.1	17.8		

t = Student t test between control and psoriatic means

t^* = Student t test btween ♂ and ♀ means in both control and psoriatic groups

* = Significant difference

≏ = Non significant difference

one X and one Y (Figs.43,44). The normal females had 46 chromosomes with 44 autosomes and 2 sex chromosomes; X X (Figs.45,46). The results of this group were collectively presented in table 11. In this group, the abnormal metaphases were encountered in 6 donors. This group had a mean abnormal metaphase percentage equaling 2%. The abnormal metaphases met with in this group were in the form of deletion and break (Fig.47) and dicentric chromosome (Fig.48).

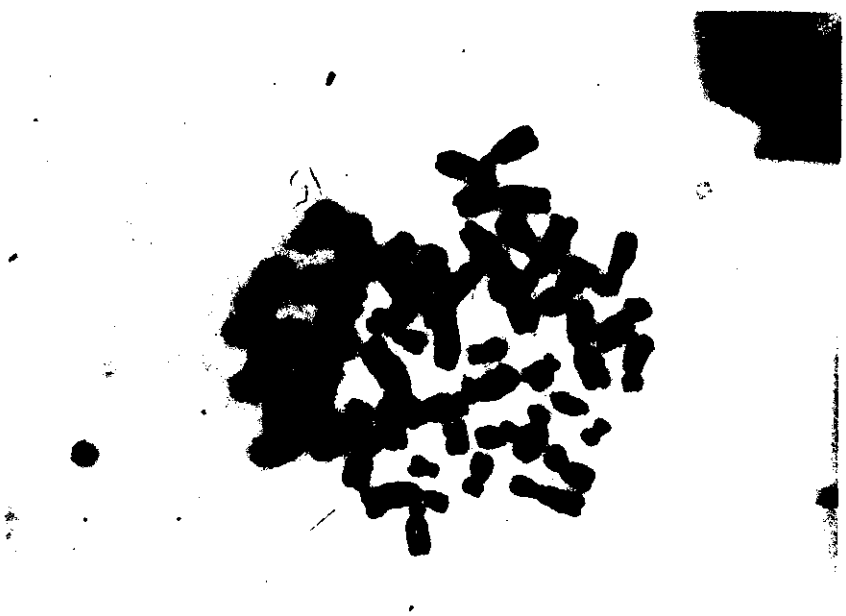
b- Psoriatic Group

I- **Chromosomal Study :**

The findings of chromosomal study for the psoriatic group patients were recorded in (Tab.12) . The abnormal chromosomes of this group constituted 2.67% of the total chromosomes. The numerical anomalies constituted 0.67% in this group, whereas, the structural anomalies amounted to 2.% . Among the defects encountered in this group, there was deletion and break (Fig.47), dicentric chromosome (Fig.48) and monosomy (Figs.49,50).There was no statistically significant difference between the percentage of abnormal metaphases in control and psoriatic groups (P >0.05).

II- From questionnare, the following was observed :

In 15 patients, psoriasis had appeared after exposure to precipitating factors in the form of psychic trouble, exposure to cold weather, trauma, infection and in one female patient

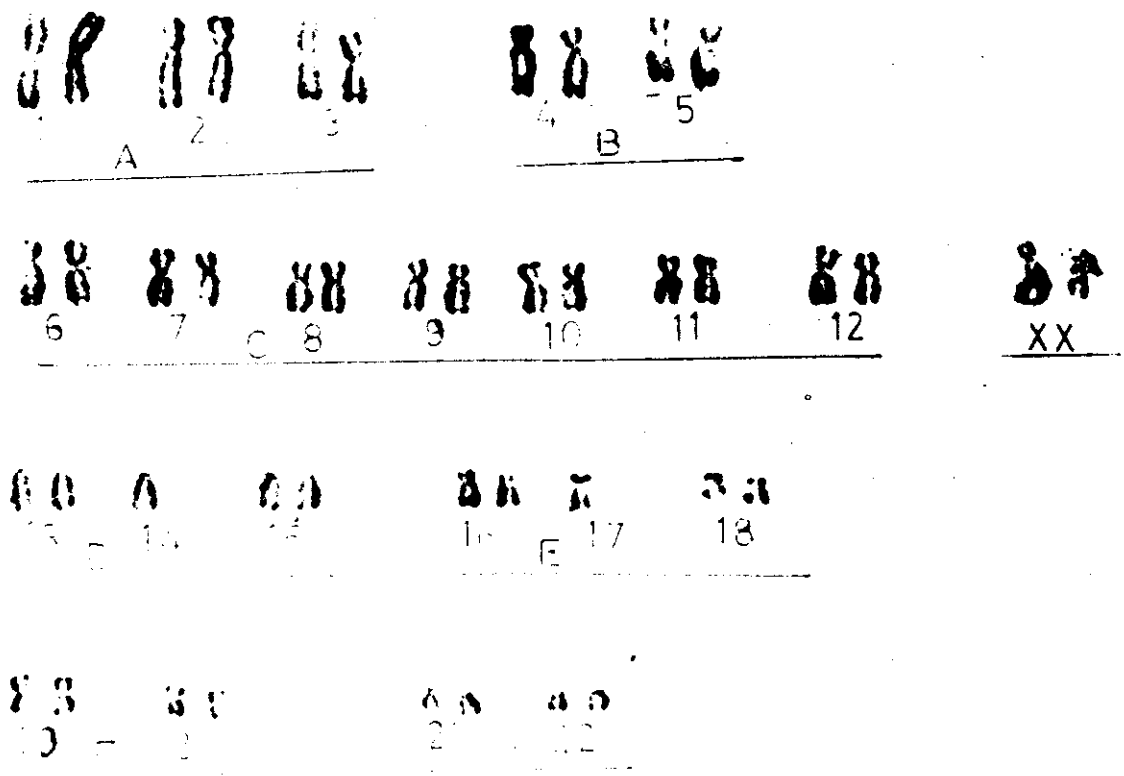


(Fig.43) A photomicrograph of a normal metaphase spread prepared from a normal male control culture. (G- banding techinque, Proj. 10x . Obj. 100x).

(Fig. 44) A karyotype of a normal male (46, xy).

(G- banding techinque , Proj. 10x Obj. 100x)

(Fig.45) A photomicrograph of a normal metaphase spread prepared from a normal female culture.
(G- Banding technique ,Proj. 10x, Obj. 100x)



(Fig.46) A karyotype of a normal female (46, xx).

(G- Banding technique, Proj. 10x, Obj. 100x)

(Tab.11) shows the details of metaphases in the control group

Case no.	Sex	age in years	karyotyping & chromosomal aberration	No. of abn. cells count /50 cells	%of abn. cells
1	♂	21	46,xy	0	
2	♂	25	46,xy	0	
3	♂	22	46,xy	0	
4	♂	33	46,xy	0	
5	♂	40	46,xy dicentrirc ♂ ,deletion ♀	6	12%
6	♂	39	46,xy	0	
7	♂	32	46,xy dicentric. 2	4	8 %
8	♂	35	46,xy	0	0
9	♂	36	46,xy	0	0
10	♂	37	46,xy	0	0
11	♂	34	46,xy	0	0
12	♂	31	46,xy	0	0
13	♂	33	46,xy	0	0
14	♂	23	46,xy	0	0
15	♂	24	46,xy	0	0
16	♀	20	46,xx	0	0
17	♀	34	46,xx	0	0
18	♀	35	46,xx dicentric 2	5	10%
19	♀	33	46,xx dicentric 3	4	8 %
20	♀	24	46,xx	0	0
21	♀	22	46,xx	0	0
22	♀	29	46,xx deletion 16	7	14%
23	♀	29	46,xx	0	0
24	♀	39	46,xx break 13	4	8 %
25	♀	40	46,xx	0	0
26	♀	38	46,xx	0	0
27	♀	37	46,xx	0	0
28	♀	28	46,xx	0	0
29	♀	38	46,xx	0	0
30	♀	36	46,xx	0	0
Total abnormal cells /1500 cells				30	
% of abnormal cells					2 %

(Fig. 47) A photomicrograph of a metaphase spread of lymphocytes culture showing deletion and break (arrows).

(G- Banding technique, Proj. 10x, Obj. 100x)

(Fig. 48) A photomicrograph of a metaphase spread of lymphocytes culture showing dicentric chromosome (arrow).

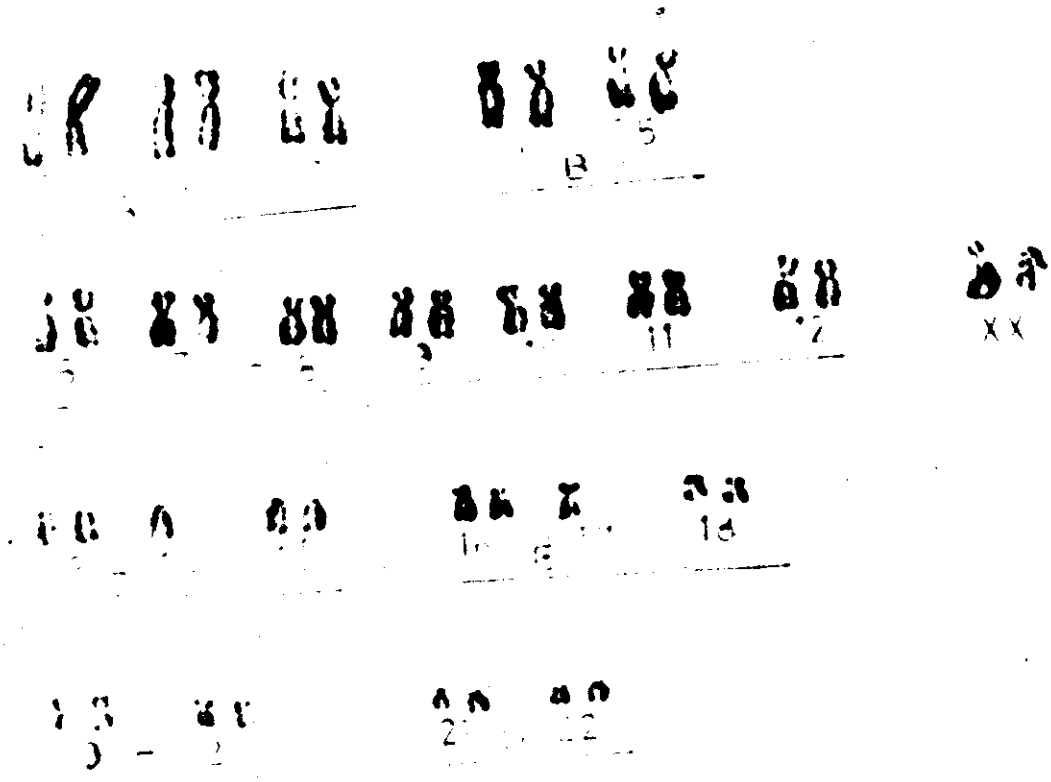
(G. banding technique ,Proj. 10x Obj. 100x)

(Tab. 12) showing the details of metaphases in psoriatic group.

Case No.	Sex	age in years	Karotyping & chromosomal aberration	No.of abnormal cell count/50 cells	%of abnorml cells
1	♀	99	46, xx	0	0
2	♀	98	46, xx	0	0
3	♂	20	45, xy−18 monosomy 18	10	20%
4	♀	95	46, xx	0	0
5	♂	92	46, xy	0	0
6	♂	21	46, xy dicentric 5 break 8	6	12%
7	♂	40	46, xy dicentric 2	5	10%
8	♂	22	46, xy dicentric 4	6	12%
9	♀	99	46, xx	0	0
10	♀	92	46, xx deletion of 2,3, 7, break 9	7	14%
11	♀	25	46, xx	0	0
12	♀	21	46, xx	0	0
13	♂	90	46, xy	0	0
14	♀	22	46, xx	0	0
15	♂	21	46, xy	0	0
16	♀	22	46, xx	0	0
17	♂	22	46, xy	0	0
18	♂	96	46, xy	0	0
19	♂	25	46, xy	0	0
20	♀	25	46, xx	0	0
21	♀	96	46, xx	0	0
22	♀	40	46, xx	0	0
23	♀	40	46, xx dicentric 2	6	12%
24	♂	29	46, xy	0	0
25	♂	22	46, xy	0	0
26	♂	20	46, xy	0	0
27	♂	40	46, xy	0	0
28	♀	25	46, xx	0	0
29	♂	25	46, xy	0	0
30	♀	22	46, xx	0	0
Total abnormal cells/1500 cells				40	
% of abnormal cells					2.67%

(Fig. 49) A photomicrograph of a metaphase spread of lymphocytes culture of psoriatic patient, showing 45 chromosomes.

(G banding technique, Proj. 10x, Obj. 100x).



(Fig.50) A karyotype of the same psoriatic patient showing monosomy of chromosome 18 (45, xy -18).
(G banding technique,Poj.10x,Obj.100x)

psoriasis appeared after pregnancy. All patients received antipsoriatic treatment before. The +ve family history was observed in 6 out of 30 cases. Consanguinity was observed in 3 cases and all were first cousins.

III- Analysis of the family pedigrees showed that:

30 unrelated probands of psoriasis included in the present study were belonging to families containing a total unmber of 822 members, 146 first degree relatives including 60 parents, 60 sibs and 26 offsprings; 77 second degree relatives and 399 third degree relatives.

The total number of relatives affected with psoriasis was 27 who included 6 first degree relatives (these comprised 2 parents, 2 sibs and 2 offsprings), 10 second degree relatives and 11 third degree relatives.

The incidence of psoriasis in the relatives of the probands was 3.28%. Regarding the first degree relatives, the incidence was 4.11%. However, the incidence in sibship alone was 3.33%; the incidence in parents was 3.33% and the incidence in offsprings was 7.69%. The incidence in 2nd.degree relatives was 3.61% and the incidence of psoriasis in the 3rd. degree relatives was 2.76%.

The incidence of psoriasis in the relatives of the probands was shown in (Tab.13). Also, the analysis revealed that the multiplex families; i.e., families having more than

(Tab.13) Showing the incidence of affected and non affected relatives of 30 patients with psoriasis.

The degree of relation	No. of relatives	No. of affected relatives	%
-First degree	146	6	4.11%
-sibs	60	2	3.33%
-parents	60	2	3.33%
-offsprings	26	2	7.69%
-Second degree	277	10	3.61%
- Third degree	399	11	2.76%
-Total	822	27	3.28%

one affected member were 6 (20%) and the simplex families having only one affected member were 24 (80%). (Figs.51-56) represented the pedigrees of multiplex families.

VI- Consanguinity analysis

Table 14 illustrates the incidence of consanguinity among patients with psoriasis. The mating was consanguineous only in 3 families. So, the proportion Pi was 10%. All consanguineous cases were first cousins. So Fi equal 1/16= (.063).

Table 15 illustrates the average inbreeding coefficient ($\sum$ Pi Fi) in psoriatic patients. It was found to be 0.0063. This value was significantly lower than the average inbreeding coefficient for Egyptian population at $P < 0.05$ which has been estimated to be 0.01005

V. Segregation analysis :

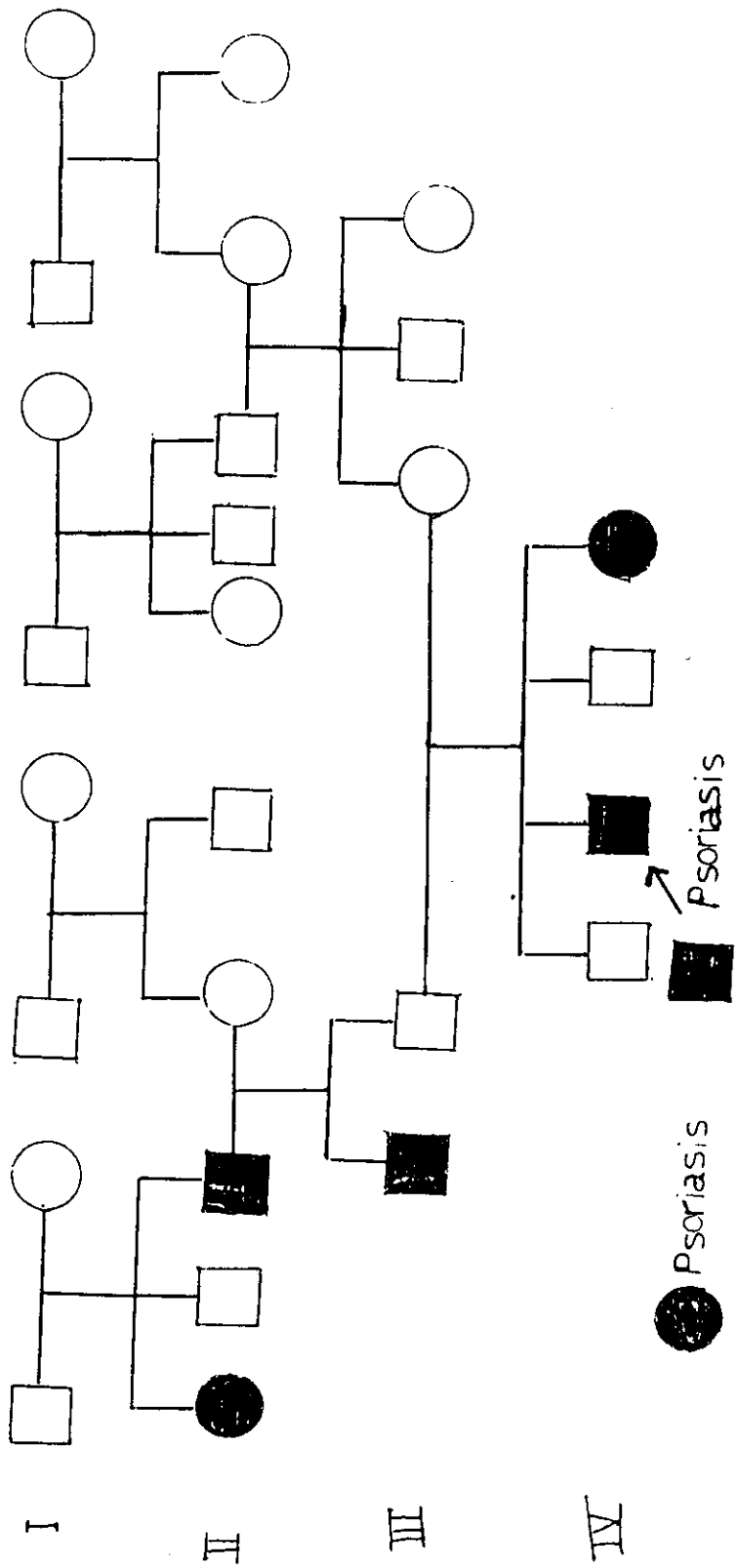
(A)- To estimate if psoriasis was inherited as an autosomal recessive inheritance :

$$P = \frac{R - N}{T - N} = \frac{32 - 30}{90 - 30} = 0.033$$

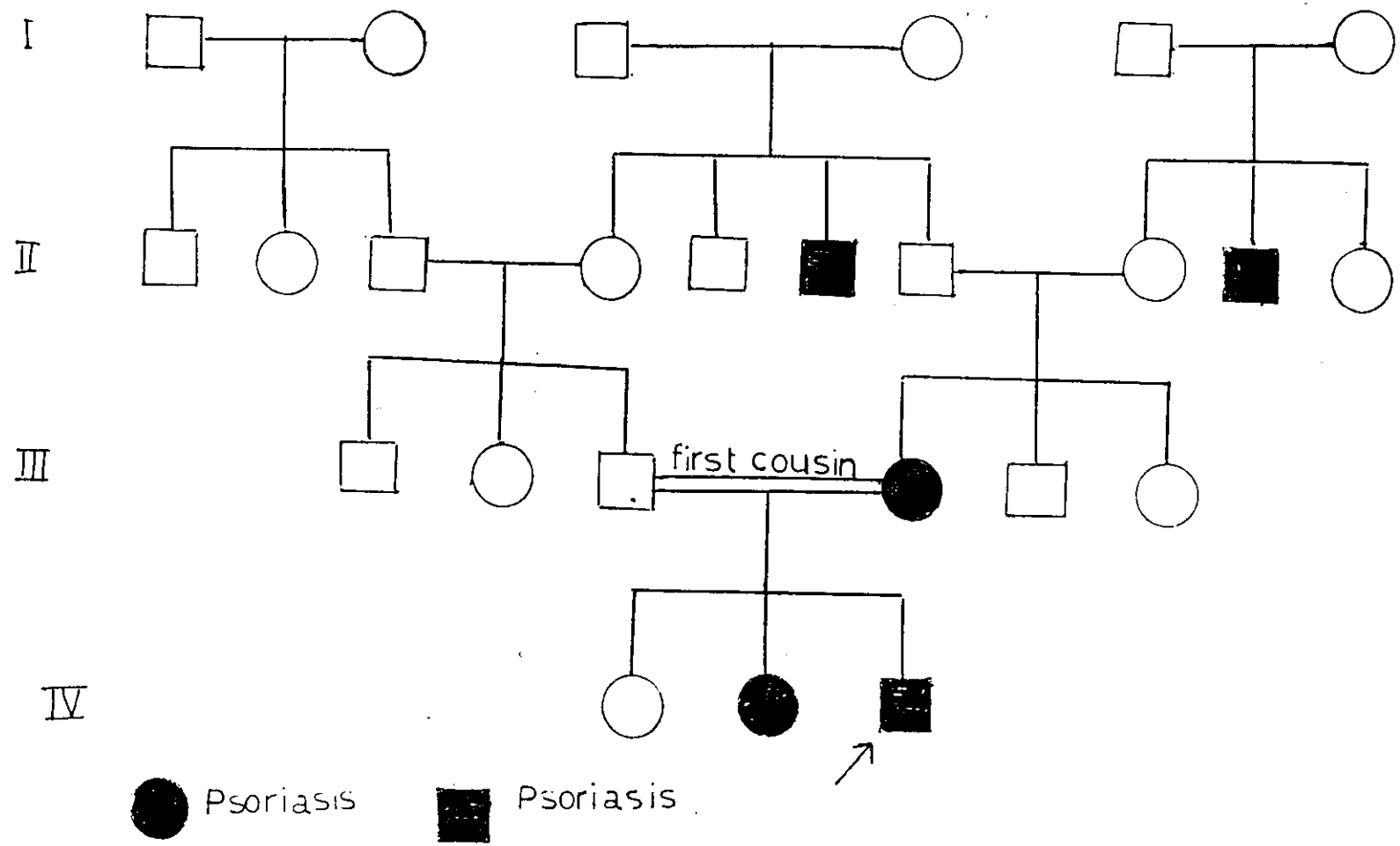
$$\text{- Standard error} = \frac{p\,q}{T - N} = \frac{(.033)\ (1 - 0.033)}{90 - 30} =$$

$$\frac{0.03}{60} = 0.0005 \qquad = 0.022$$

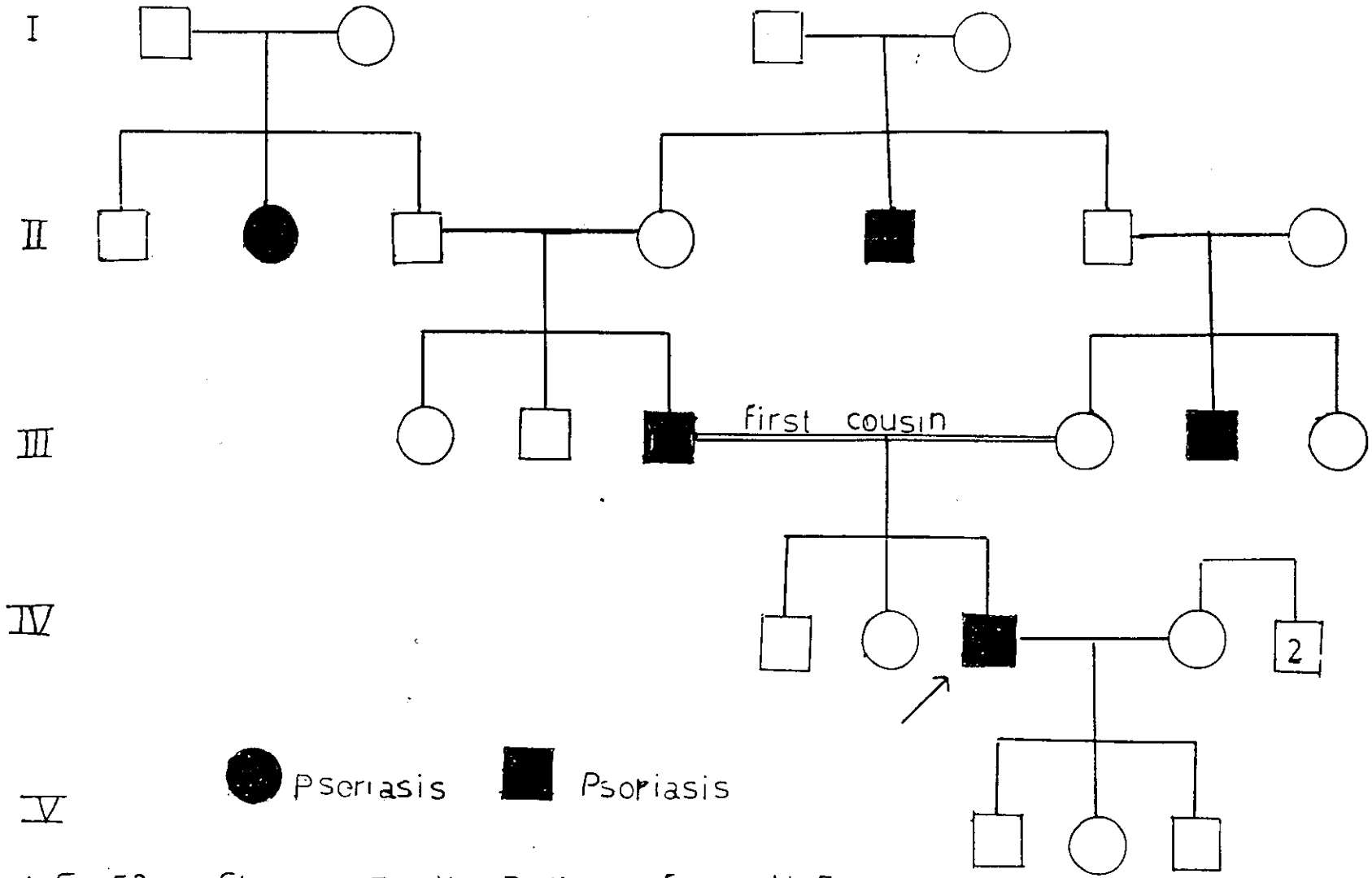
Hence the probability of ascertainment was 0.033 ± 0.02 At 95%



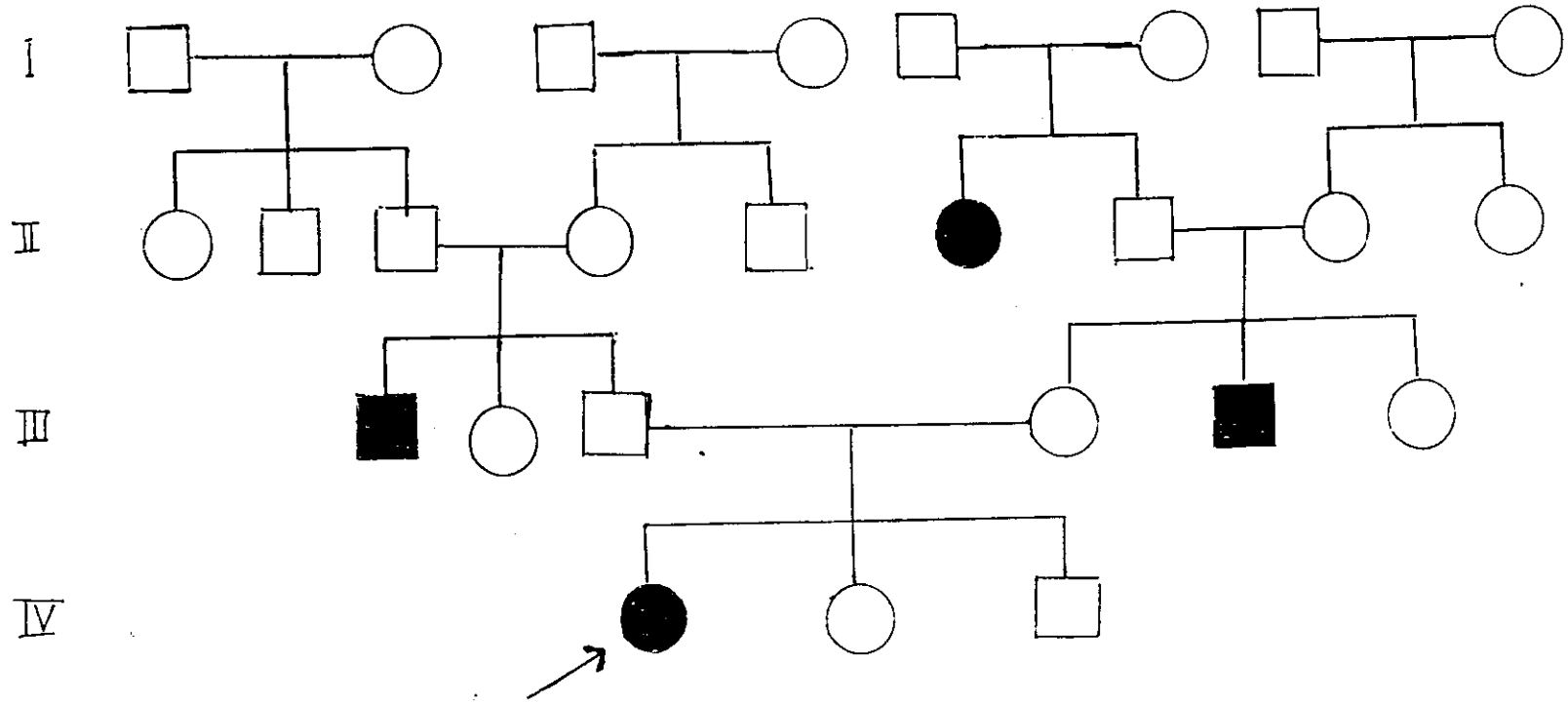
(Fig. 51) Showing Family Pedigree of case No. 3



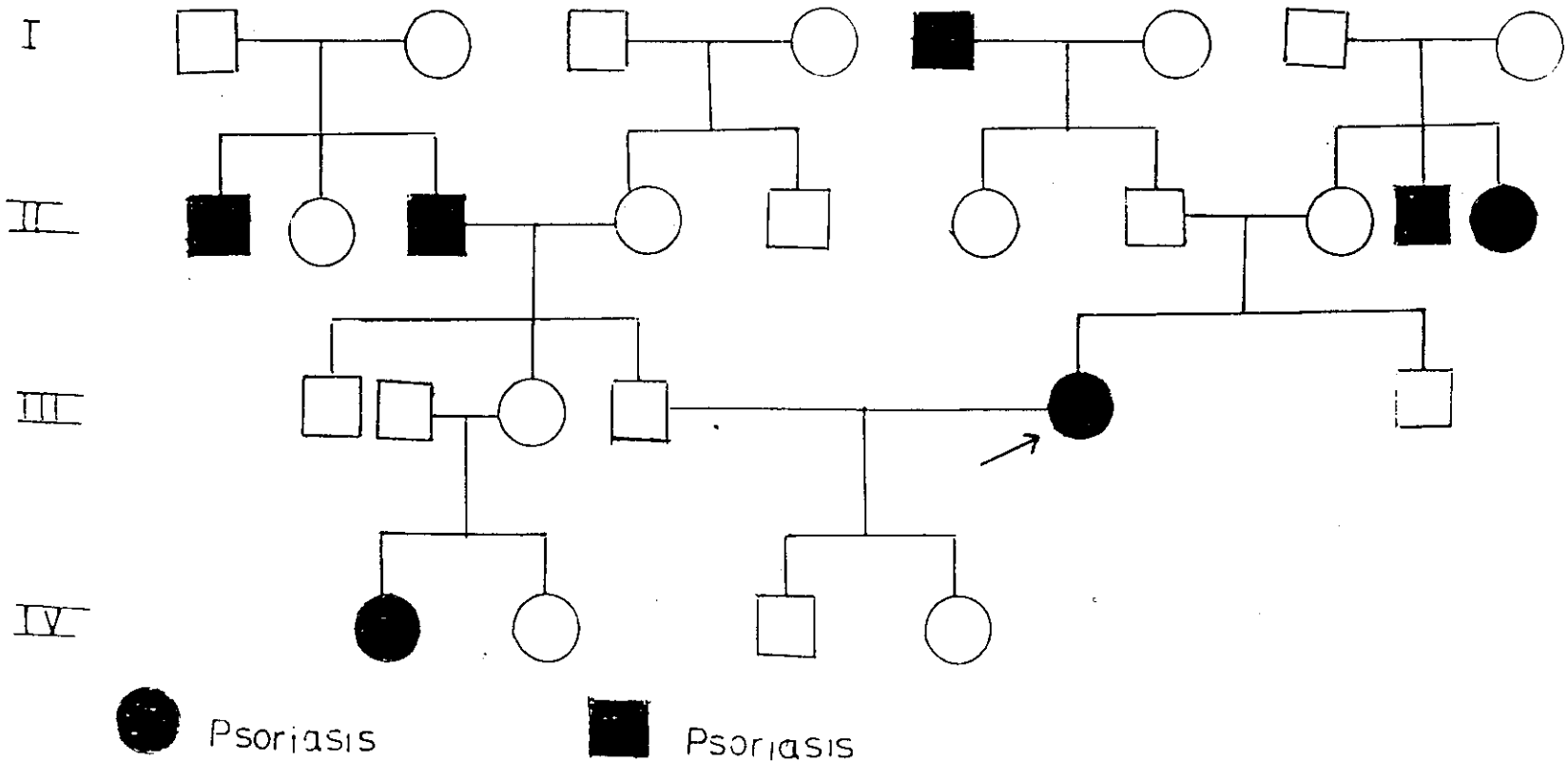
(Fig. 52) Showing Family Pedigree of case No. 6



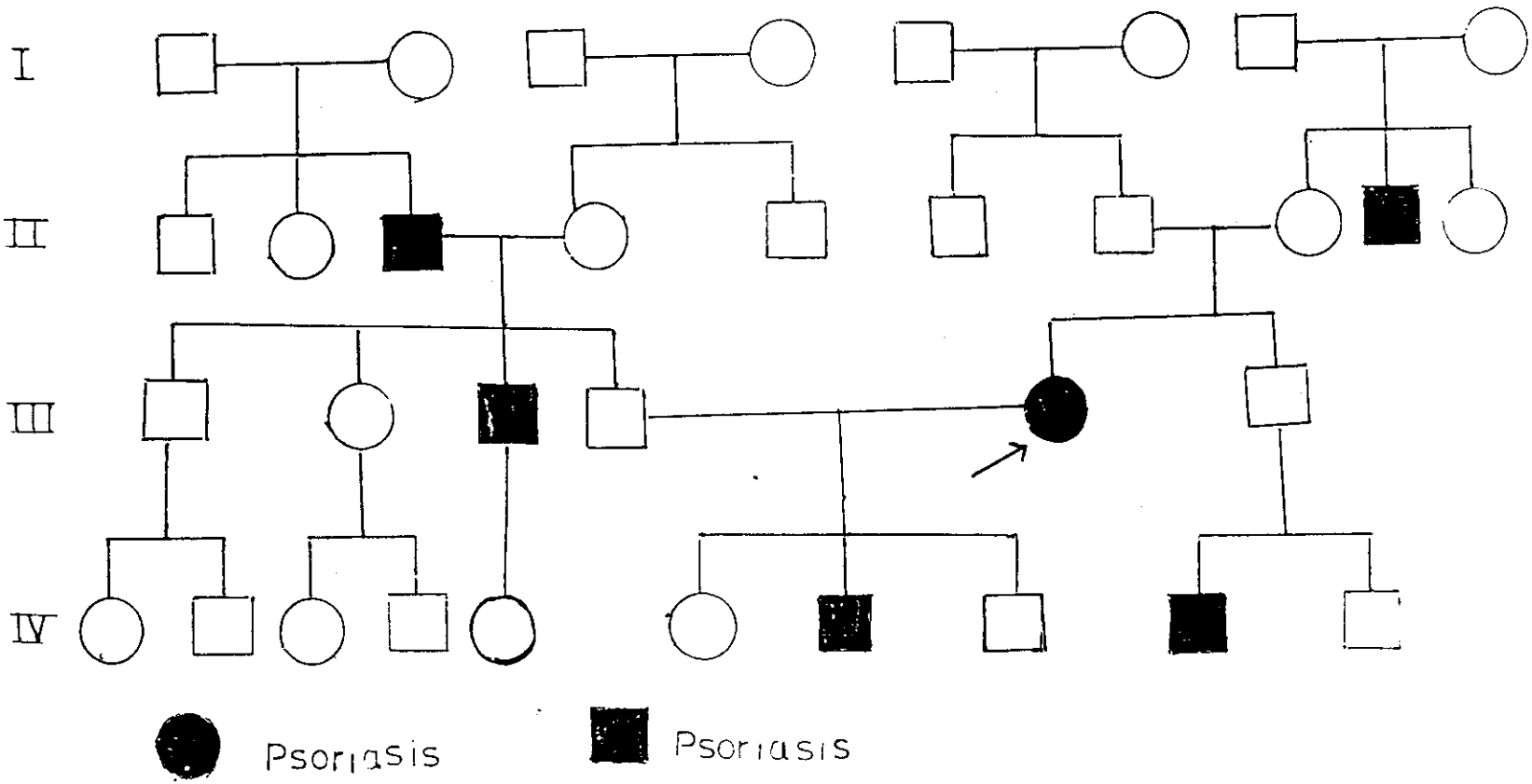
(Fig.53) Showing Family Pedigree of case No.7



(Fig.54) Showing Family Pedigree of case No 8



(Fig.55) Showing Family Pedigree of case No. 10



(Fig 56) Showing Family Pedigree of case No 23

(Tab 14) showing the incidence of consanguinity among patients with psoriasis.

	Number	Incidence %
-Total No. of Cases	30	100 %
-No. of patients with consanguinity	3	10 %
- No. of non consanguineous cases	27	90 %
- First cousins	3	10 %
- First cousins once removed	0	0 %
- Second cousins	0	0 %

(Tab.15) Illustrating the average inbreeding coefficient in psoriatic patients.

Σ Pi Fi = 0.0063

	Total	First Cousins	First cousins once removed	Second Cousins
No. of marriages	30	3	0.0	0.0
Proportion (Pi)		0.1	0.0	0.0
Inbreeding (Fi)		0.0625	0.0313	0.0156
Pi Fi		0.00625	0	0
Σ Pi.Fi		0.0063		

confidence limits, the probability was equal to 0.033± (1.96 × 0.02) i.e.it ranged from 0.076 to 0.010.

The probability of ascertainment did not accomodate the theoretical value for P in autosomal recessive inheritance which was equal to 0.25. Thus the collected data were inconsistent with autosomal recessive inheritance.

(B) To determine if the disease was inherited as an autosomal dominant trait, the number of affected offsprings of an affected parent with a healthy spouse was compared with the expected number using χ^2 test. It was found that out of 38 offsprings of affected parents 7 were affected and 31 were not affected. Thus, χ^2 was 15.2(Tab.16). So, χ^2 is significantly different (with one degree of freedom).because χ^2 exceeded 3.841 So,the result was not consistent with autosomal dominant.

(C) Also, the observation of pedigrees revealed that there was no consistent father-to-son transmission which excluded Y linked inheritance (whether dominant or recessive). Also, there was no probability of X linked dominant inheritance because non of the daughters of affected males was affected. In case of affected females, the ratio of affected sons to affected daughters was not 1:1 so this excluded X linked recessive inheritance.

(D) Having decided that the data were inconsistent with single

(Tab.16) Showing the number of affected and normal offsprings of affected parents of observed group compared with those of expected group using X^2 test.

Offsprings	Normal	Affected	Total
Observed (O)	31	7	38
Expected (E)	19	19	38
$(O - E)^2$	$(31 - 19)^2$	$(7 - 19)^2$	288
$\Sigma \frac{(O - E)^2}{E}$	$\frac{144}{19}$	$\frac{144}{19}$	15.2

gene defect, the test for multifactorial (genetic-environmental interaction) inheritance was undertaken.

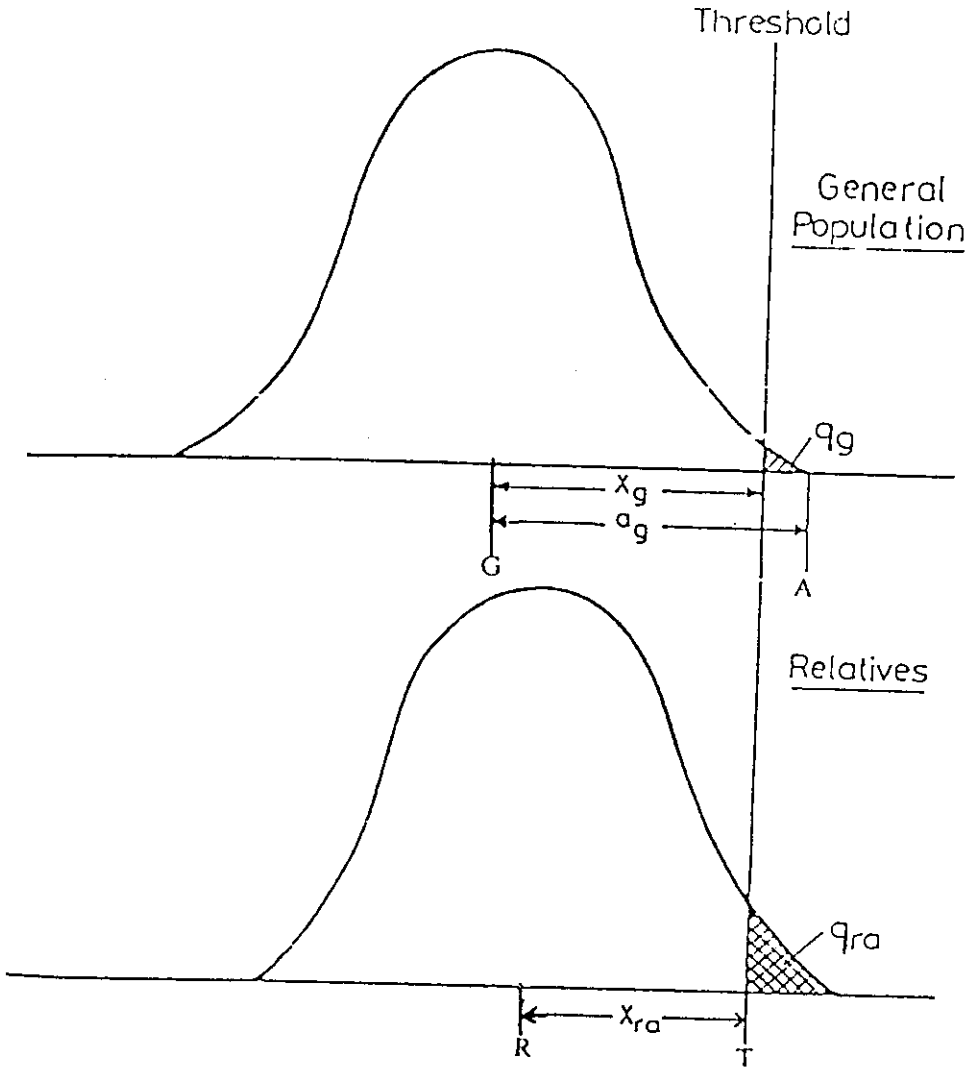
(1) First, the hypothetical curve of liability was constructed (Fig 57).

- The incidence in general population (^{q}g) has been estimated by 1.87% So, $Xg = 2.08$ and $ag = 2.45$.
- The incidence in relatives of probands($qr\alpha$) = 3.28% So $Xr\alpha$ = 1.83.
- The curve for relatives was shifted to right in comparison to that for the general population. So, this finding was consistent with multifactorial inheritance.

(2) Relative frequency determination :

- The relative frequency was calculated as S/Q where S is the frequency in siblings = 3.33% and Q is the frequency in general population= 1.87%.

S/Q was found to be equal to 1.78. This value was compared to the expected relative frequency values of various modes of inheritance (Tab. 17) . It was found that this observed value was near to the relative frequency expected for multifactorial inheritance ($1/\sqrt{Q}$ which equals 0.732). While it was far from that expected for autosomal dominant ($1/2Q$ which equals 0.267) and also far from that expected for autosomal recessive inheritance ($1/4Q$ which equals 0.134). This strengthened the multifactorial basis for inheritance of



(Fig.57) Showing hypothetical curves of liability in general population and in relatives of probands with psoriasis

q_g =incidence of trait in general population

x_g =deviationof the mean of the threshold from the mean of general population.

a_g =deviation of the mean of the affected from the mean of general population .

G = the mean of the general population .

A =deviation of the mean of the affected from the mean of population.

q_{ra} = incidence of trait in relatives of the probands .

X_{ra} =deviations of the mean of the threshold from the mean of relatives of the probands .

R = the mean of relatives of the probands .

T = threshold .

(Tab.17) The observed and expected frequencies of psoriasis in the proband's siblings.

Frequency in general Population Q	Frequency in siblings S	Relative frequency S/q			
		Observed S/Q	Expected		
			dominant 1/2Q	recessive 1/4Q	multifactorial $1/\sqrt{Q}$
1.87%	3.33%	1.78	0.267	0.134	0.732

psoriasis.

(3) The frequency among first degree relatives was found to be

$$\frac{\text{Affected first degree relatives}}{\text{Total number of first degree relatives}} = \frac{6}{146} = 4.11\%$$

This figure was near to $\sqrt{Q}$ (where Q was the frequency in general population) which equal 1.37. This also was consistent with multifactorial inheritance.

(4) The frequency in affected relatives was found to decrease with the descent in the relationship. Since the frequency among first degree relatives was 4.11%.,for 2nd. degree relatives was 3.61% and for 3rd. was 2.76% (Tab.13).This strengthened the mode of multifactorial inheritance.