contain a Mediterranean component. In this respect it may be important to point out the low frequencies of Rh negatives which are found in some parts of Zeeland. When dividing the total material into 3 groups, it appears that there exist obvious differences in the ABO blood groups between the original Frisian, Frankish and Saxon parts of the Netherlands. These differences are highly significant for the country as well as for the towns. If we compare the country and the towns within the 3 groups, significant differences are observed in the Frisians and to a less degree also in the Saxons. There is no difference between the Frankish country and the Frankish towns. This shows that the Frisian and Saxon towns have been influenced by the Frankish component of the population, while the Frankish towns were not influenced by the Frisian and Saxon components. It remains doubtful whether this Frankish influence has played a part in the foundation of the towns or if this is of more recent date.

One could imagine that already in the early Middle Ages after the subjection of the Frisians and Saxons by the Franks, a ruling class, a commercial group and soldiers settled in the subjected regions. This group may have founded the first town communities. On the other hand, in the course of centuries until the present time migrations may have occurred from the often poor southern districts to the towns in the north, which may explain this Frankish influence.

There seems to be no obvious correlation between the distribution of the Rh factor and Frisian, Frankish or Saxon origin. The differences between these territories and also between town and country are irregular and less significant or not significant at all. The average percentage of Rh-negatives in the Netherlands is 16.75%.

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Blood Groups in Sephardic Jews

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Sephardic Jews are the descendants of the Jews who were expelled from Spain in 1492 and from Portugal in 1497. There are some indications that Jews settled in Spain in the early centuries of the Christian era. During their long sojourn in the Iberian peninsula migrations to and from North Africa took place. The present study is concerned with Sephardic Jews from the Balkan countries (Turkey, Bulgaria, Greece and Yugoslavia), who came to Israel between the years 1949-1957. The ABO, MN and Rh-Hr groups of 200 persons were examined.
As may be seen from table I, the frequency of the O phenotype is rather low in the Sephardic community, in comparison with figures obtained by us for Moroccan Jews (37.7%), and Tunisian Jews (39.5%). It is suggested that the high group O frequency indicates a Berber influx. It seems, however, that the African component has penetrated the Sephardic Jews only to a limited extent, in spite of the frequent contact over centuries.

An interesting feature is the high frequency of the phenotype A, namely 45%, which is the highest figure so far found in the Jewish communities studied by us. The high A group level found in the Sephardic Jews may be regarded as a later acquisition, confirming the well-known historical fact that their route to the Ottoman Empire led through Europe, rather than through North Africa. It may be noted that a frequency of about 42% of group A was also found in some populations of the Balkan peninsula, e.g. Turks, Serbians and Bulgarians (Mourant, 1954).

Table I

**ABO Blood Groups in Sephardic Jews**

Table II

**MN Blood Groups in Sephardic Jews**

The phenotype B was found in Sephardic Jews at a frequency of 16.0% which is lower than that encountered in the population of North Africa, Berbers and Arabs. This, too, might be taken as an indication of less than average North African admixture.

In table II the M and N frequencies in Sephardic Jews are presented. As may be seen, M and N genes are evenly distributed; the phenotypes, however, show the interesting phenomenon of heterosis with the unusually high percentage of 70% for the MN phenotype. In this respect the Sephardim stand out from the other Jewish communities so far studied. Whether this heterosis is a reflection of the heterogeneity of the Sephardic Jews developed in their cultural, economic and social life, remains open to speculation.

It is interesting to note that among the European peoples high figures for MN phenotypes up to 75% were found by several authors (Horse and Sarandeses, 1951), (Horse and Marcos) in some parts of Spain.
In table III the distribution of blood groups in the Rh-Hr system are presented. The highest figure was obtained for the CDe, 46.8 %, the so-called Mediterranean chromosome, which was found to be high in most Jewish communities studied by us. The same observation was stressed by Mourant (1954), and suggests the common Mediterranean origin of the Jewish people. The chromosome cde follows with a high frequency of 26.5 %. This chromosome is found more often in the heterozygous state, while the homozygous ccddee phenotype is infrequent (7%), as found in some Oriental Jewish communities, e.g.

Table III

Rh-Hr Blood Groups in Sephardic Jews

Baghdadi, Kurdistani and Persian Jews. The high level of cde may be due to the acquisition of a Basque component or of a Berber component from North Africa. The frequency of chromosome cDe, characteristically high in all populations of Africa, was found in the Sephardic Jews to amount to 11 %. This is somewhat higher than that encountered in Moroccan and Tunisian Jews. How has this chromosome penetrated the Sephardic stock? According to Mourant, this component was presumably acquired mainly in Egypt and elsewhere in North Africa, but some may have come through Spain, where raised cDe frequencies are found in several regions. The latter seems most probable, as no other indications were found to suggest the penetration of considerable North African elements in Sephardic Jews.