

## ENGLISH SUMMARY

### GEOGRAPHICAL SURVEY OF THE SOUTHERN CARMEL COAST

by Y. BEN-ARIEH, Y. NASHIV and S. REICHMAN

The area under investigation is about 60 sq. km. wide, and can be divided into two main longitudinal sub-units: the eastern plain and the western region. A narrow kurkar ridge, whose height reaches 32 m., divides them.

The eastern plain is the local base level of several Carmel streams, and subsequently shows patterns of alluvial accumulation and disturbed drainage due to the obstacle of the kurkar ridge; hence artificial outlets have been cut since historical times. The western region contains small kurkar ridges, alluvial trenches between them and swamps. These latter still exist because of the high ground water level near the coast.

The distinctive feature of the climate in the area, a feature closely related to the nearness of the Carmel to the sea, is the unusually high mean and absolute minimum temperatures in winter. Hence probability of frost is almost nil. On the other hand the area is noted for strong winds, associated with the dry eastern flows (sharav) in the intermediate seasons. Precipitations amount to 500–550 mm. annually. Soils range from light sandy soils to dark, heavy and partially undrained soils in the south. —

Noted for its key position, the area has known two main longitudinal routes. The historical (Roman) road from Caesarea to Acre followed the western plain more closely, probably owing to the existence of the harbours of Dor and Athlit. The modern road from Hadera to Haifa, completed in 1936, prefers the eastern plain.

### THE ABRASION PLATFORM AND THE CLIFF OF THE SOUTHERN CARMEL COAST

by D. SAFRA

The Southern Carmel Coast is distinguished by a large number of solution forms. In the rocky sections of this coast, consisting of kurkar (calcareous sand), two parts can be seen: (a) the abrasion platform —

a remnant of the horizontal abrasion of sea waves, and (b) a coastal cliff descending to the platform.

The solution forms of the platform are different from those of the cliff. In the abrasion platform various small and large forms appear: alveoli, vermiculation, lapiès and different kinds of potholes. On the edge facing the sea, where corrasion and corrosion cease, organogenic growth starts. The cliff exhibits thick and thin needles as well as potholes, some of the latter reaching two metres and more in diameter. The higher we go up the escarpment, the more dominant becomes the structural factor.

The larger solution forms are found in the area of contact between cliff and platform. In this area niches and caves are found.

The abrasion platform displays a great wealth of flora and fauna which have a decisive influence on the variety of solution forms. The large forms at the foot of the cliff are located where salt water and soft fresh water meet.

## THE MORPHOGRAPHIC CONFIGURATION OF THE WESTERN STRIP OF THE SOUTHERN CARMEL COAST

by Z. RON

The western strip of the Southern Carmel Coast may be subdivided into five longitudinal belts. Three of them are kurkar ridges, while the other two are topographical depressions covered by sand and soil. The easternmost ridge stretches the entire length of this coastal plain. The intermediate and western ridges exhibit large gaps and are considerably lower than the eastern one. The gaps in the western one are covered with sand, which forms pocket beaches and from which small dunes rise.

The kurkar ridges, and particularly the western one, exhibit many features due to solution processes by sea water along the coast and by rainwater farther inland. The ridges are asymmetrical, as their eastern slopes are much steeper than the western ones, thereby indicating their origin from dunes. On the western slopes there exist some small ledges which probably represent remnants of former shore stages.

## LE CONTACT ENTRE MONT CARMEL ET LA PLAINE CÔTIÈRE

par Dov NIR

Le contact entre le Mont Carmel et la plaine côtière occidentale se relève en un escarpement d'abrasion marine ancienne (Plio-Pleistocène). Les processus abrasifs sont évidents par la présence du grès côtier (kourkar) aux pieds du Mont Carmel (au Sud de Zikhron Yaaquob) et par deux niveaux de terrasses marines, l'un à 30-35 m. au-dessus de la Mer Méditerranéenne (l'extrémité Sud de l'escarpement) l'autre à 40-45 m. (la partie entre Nahal Oren et Ofer).

LAND UTILIZATION IN THE SOUTHERN CARMEL  
COASTAL PLAIN

by Y. BEN-ARIEH, Y. NASHIV and S. REICHMAN

A field survey carried out in March 1960 attempted to compare land-use in British Mandatory times (about 1947) with that of 1960. An evaluation of the main natural factors appears in another article in this issue.

*Population, Settlements and Land-Use, 1947, 1960*  
(area in dunams)

	Population	Settlements	Irrigated land*	Unirrigated land
1947	8,170	12	500	38,876
1960	7,966	13	21,365	13,445

\* Includes subtropical plantations and fishponds.

The land-use map in 1947 shows Mediterranean unirrigated crops and plantations (olives and vineyards) as the most common type of land-use, while the southern and western parts of the area are not used at all. In 1960 three longitudinal strips can be distinguished: *plantations* (citrus, bananas and vineyards) in the easternmost section of the plain, at the foot of the steep slopes of Mount Carmel; *irrigated field-crops* occupy nearly all of the eastern plain, while the western part of the region is mainly characterized by *fish-ponds*.

A more detailed study of the location and the pattern of the Jewish settlements in 1960 reveals the contrasts between the land utilization of the collective, communal settlements (Kibbutzim) and the cooperative, individual settlements (Moshavim).

Several conclusions can be drawn from both studies:

(a) The great change in land-use brought about by intensive Jewish colonisation in 13 years did not result in a rise in agricultural population, although the *number* of settlements has risen. Furthermore, most Jewish settlements stand on their agricultural land, whereas the Arab villages were usually situated on non-agricultural land.

(b) The most distinctive feature of Jewish colonisation lies in the reclamation of 'negative' areas, such as swamps and sand dunes, and in the eventual correct utilization of the specific natural conditions of the area by introducing highly profitable crops, such as carp raised in ponds, bananas, etc.

(c) The population of the Kibbutz and the Moshav is predominantly agricultural. In the Moshava (Athlit) and the Arab village, whose population is much larger, there remains only a core of agricultural settlers; most of the inhabitants are engaged in non-agricultural work.

(d) The land-use of the Kibbutzim is highly organized around a few main branches, such as fish-ponds or cash-crops, while the more limited possibilities of the individual settler in the Moshav tend to a more rigid form of land-use. Finally, the Moshava and the Arab village show a marked shift from field crops to plantations.

#### FASSUTA: TRENDS IN THE DEVELOPMENT OF AN ARAB VILLAGE IN ISRAEL

by A. BROSH

The structure and appearance of the village of Fassuta in the central part of Upper Galilee in the last quarter of the nineteenth century form the point of departure of this paper. The extent of the built-up area and its relation to the area of cultivation are discussed, as well as certain pertinent traditions preserved by the villagers. Developments in the pattern of the village and its buildings as well as the pattern of agricultural occupation are illustrated especially with reference to the growth of population, the development of the built-up area and the type of rural construction and changes in the social organisation of the population.

Table I  
Growth of Population and Built-up Area

Year	Population					Built-up area					
	Length of preceding period in years	No. of population	Percentage of preceding estimate	Average annual increase	Built-up area (in dunams)	No. of houses	No. of rooms	No. of rooms per house	No. of persons per house	Floor-space per person in sq. m.	Increase of built-up area per yr. in sq. m.
1878	125	200		1.4	4.4	40	45	1.1	5.0	22.0	35.2
1918	40	410	205	2.1	8.5	75	160	2.1	5.5	20.7	102.5
1948	30	750	180	11.3	15.0	135	340	2.5	5.6	20.0	216.7
1959	12	1350	90	50.0	24.0	180	490	2.7	7.5	17.8	750.0

The final part of the paper deals with trends in the agricultural economy of the village with special reference to intensification of cultivation, the cultivated area and the efficiency of the agricultural economy.

A trend towards intensification accompanied by an increasing restriction of cultivated land is evident.

Table 2  
Size of Agricultural Economy

Cultivated area in dunams	Number of agricultural units		Percentage of the total number of agricultural units		Percentage of the total cultivated area	
	1949	1959	1949	1959	1949	1959
Up to 20	30	90	23	55	5	26
20-50	80	60	63	36	59	47
Over 50	18	15	14	9	36	27
	128	165	100	100	100	100

## LES COUDES DU NAHAL DICHONE

par A. YAIR

Le présent article traite du tracé particulier que présente Nahal Dichone dans son cours moyen. Le long de 8.5 km. cette rivière change brusquement

à cinq reprises successives sa direction originelle. L'étude détaillée de la région nous a mené à la conclusion que ce tracé est relativement récent et résulte de la réunion de deux rivières qui coulaient autrefois en sens inverse — la première vers la vallée du Houla, la seconde vers le Litani. Cette réunion fut causée par les changements topographiques tenant à l'apparition de flexures et de failles en rapport avec les mouvements endogènes qui revirent dans la région vers le début de l'époque quaternaire.

## ON THE HAMADA IN ISRAEL

by D. SHARON

The paper presents the results of experimental work carried out on the *hamada*, on two experimental plots in the Negev, Israel. The observations during the first five years lead to the following conclusions:

1. The hamada is formed through a process of eluvial character during which the movement of the hamada stones themselves is very limited.

2. The hamada under consideration is representative of a state of balance in the slopes. This balance is characterised by a high degree of stability; its disturbance does not create a new state, trending to a morphological development of its own, but leads to a relatively quick process of regaining its initial state of balance. Disturbance of the hamada increases the erosion processes only temporarily, as at the same time it also constitutes a sort of 'trigger-action' for the process of hamada renewal, and thus for the re-establishment of the balance.

3. We are unable, at this stage of the experiment, to determine the lapse of time required for completion of the process of hamada renewal, but there are indications that the process is relatively quick, especially at the beginning. The basal horizon of a new hamada did develop on the surface of most of the plots (approximately 75% of this area) during the five years of the experiment, and the first signs of the loose horizon are already appearing.

4. The part played by the water in erosion could unfortunately not be exactly ascertained, but there is no doubt that it exceeds the part played by the wind in transporting material from the eroded soil. This result is in agreement with Mortensen's opinion on the secondary role of wind in sculpturing desert landscape, and against the opinion formerly accepted (e.g. J. Walther).

5. The quantity of soil eroded from the plots during the first five years of the experiment is equivalent to a layer of approximately 15–20 mm. It is expected that the process of erosion will continue simultaneously with the development of the new hamada, though at a much slower rate.

## TYPES OF RAINFALL YEARS IN ISRAEL

by E. EFRAT

The purpose of this paper is to examine whether the appearance of rainfall years in Israel is casual or is a sequence of particular types of rainfall seasons.

For this purpose three stations were selected: Jerusalem—in the mountains—with 92 years of records, Miqve Yisrael—coastal plain—with 58 years of records, and Beersheba—with 30 years to represent the border zone of the semi-arid region. The rainfall years in these stations were examined from the point of view of their annual rainfall, the annual distribution curve and the maximum amount of rain in the season.

16 different types of rainfall years can be distinguished, four of which were most frequent. These latter included 80.4% of all the frequencies in Jerusalem, 77.2% in Miqve Yisrael, and more than 50% in Beersheba.

The comparison between the three stations showed that there is a greater similarity between the Jerusalem and Beersheba types than between those of Jerusalem and Miqve Yisrael. The comparison also proved that in Jerusalem there is a tendency to months of maximum rain in the middle of the season, while at Miqve Yisrael the tendency is maximum rain at the beginning of the season.

The actual types of the rainfall years in Israel depend on the interrelation between warm anticyclonic air which lies above the region in summer, and unstable cyclonic air which arrives in winter, accompanied by increasing cyclonic activity.

### *Miscellanea*

A. P. Schick, in a letter to the editor on the nature and morphogenesis of Agam Dalton, takes exception to the argumentation advanced by D. Nir and A. Yair in *Yediot*, XXIV, 1960, pp. 183–209. Agam Dalton is a prominent basin-like feature in eastern Upper Galilee located on the basalt plateau of Dalton. Schick points out that the volcanic material at the time

of its flow was in a considerable state of fluidity. It therefore should have sealed all karstic fissures and holes in the area covered by it. Active points of karstic drainage, as ponors, are always located in the lowest topographic area. They therefore should have been covered and sealed first and even by a thicker layer of impervious lava than the rest of the plateau. This and further arguments make the continued operation of karstic processes under an impervious basaltic area extremely unlikely and it is on this basis that Schick rejects the genetic thesis of the earlier authors.

Schick proposes to make Agam Dalton the type case of inverted relief in a karstic environment where a negative form exists in rocks of great hardness. In accordance with such features as monadnock and mendip, which are called for their type locality, he proposes to call such features occurring in a karstic environment *dalton*.

A. Shahar reports on a research project on the delimitation of the Central Business District of Tel Aviv and the tendency of its expansion. This research is based on a detailed mapping of close to 10,000 occupancy units.

A. Bitan reports on the initial stages of a topo-climatic survey of the Besor Region. This is the westernmost part of the Beersheba Basin for which at present plans for intensive settlement are prepared. Climatic risks here might be considerable, e.g. low and irregular rainfall, frost, high potential evapotranspiration. As against these, there should be certain climatic advantages, as dew and high heat values. The areal extent of all these features is unknown within the limits of accuracy required for planning and the survey reported upon is designed to provide the necessary information.

The Israel Geographical Society was founded in July, 1961, and has branches in Jerusalem, Tel Aviv, Beersheba and Haifa, as well as a rural branch. The report contains details of the foundation meeting and of meetings in the various branches. The annual professional meeting was devoted to two subjects: recent advances in climatology and agricultural geography. The annual field meeting will be held in Arad on May 22, 1962.