fundamental geomorphological laws: rivers highly concentrated with sediments tend to form dykes, especially in alluvial plains. These dykes can reach such hights that the ground of the river bed rises several metres above the surrounding alluvial plain[9]. This process has been studied especially for the Mesopotamian region by P. Buringh.

Fig. 5, reprinted from p. Buringh, Soils and soil Conditions in Iraq[10] shows the process of formation of such dykes. Whereas river-and canal dykes aggradate sediments gradually and thus form themselves in natural ways, the surrounding land keeps its original level. But this process does not go on infinitely: at a certain point of time a great flood will suffice to make the dykes burst and flood the lower-lying plains completely[11].

This certainly was the true reason for the great disaster of 629 A.D. That made the great cultural centres of the South Mesopotamian region inaccessible for more than 1000 years.

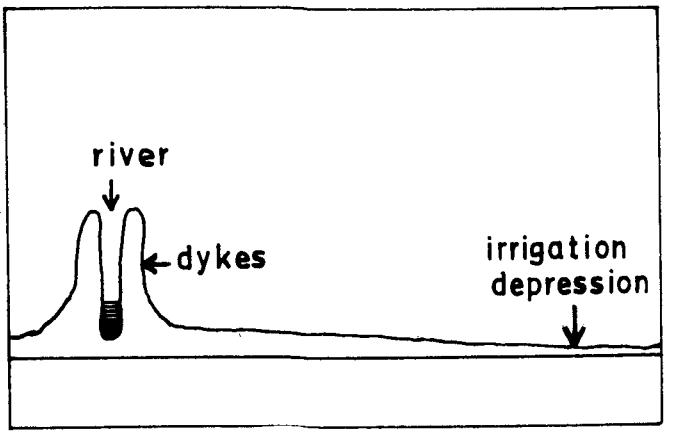

Fig. 5 Cross section of river and irrigation depression and the formation of dykes.
(ac. Buringh, Soil and Soilonditions in Iraq)

(9) Die Entwicklungsgeschichte der Erde. Bd. I. Hanau 1971. p. 160.
(10) P. Buringh. Soil and Soil Conditions in Iraq. Baghdad 1960. p. 155.
(11) Herbert Louis. Allgemeine Geomorphologie. Berlin 1968. p. 101.

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5. Guy le Strange. Description of Mesopotamia and Baghdad, written about the year 900 A.D. by IBN SERAPION. The Arabic text edited from a MS in the British Museum Library, with translation and notes; in: Journal of the Royal Asiatic Society London. London 1895.
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sinking of the water level of the " Great Swamp". But the reason for the fact that the Euphrates area from Niffar to Nasiriya is predominantly mainland today might be the consequence of another event.

Fig. 4a and 4b show both the dimensions of the swamp of the aforesaid region at the time of Ibn Serapion and the present – day dimension of the marshes round Lake Hammar. The fact that the swamp got smaller from 629 A. D. up to our times can be ascribed to the gradual accumulation of Euphrat sediments in the region between Niffar and Nasiriya.

Southeast of Nasiriya near Suq ash sheyukh even today the waters of the Euphrates flowing into the marshes are muddy and concentrated with sediments, whereas in Qurna the waters leading to the Shattel-Arab are clear, because the sediments have mostly been deposited at the beginning of the marshes. This is due to fundamental geomorphic laws: The speed of river flow declines as it discharges into marshes. The sedimentary particles carried along by the force of river flow are now deposited in the river delta region of the marshes. The Euphrates " pushes a delta into the marshes ".

The arrows marked " B" of fig. 2 show the shallow zones which are of a lighter colour thus distinctly setting of against the other formations of the marshes. The producing of the delta into the marshes brought on by the Euphrates and its branches is clearly to be seen.

During a period of tectonic repose the marshes and Lake Hammar will, therefore, gradually be completely filled up with sediments. As a result of this phenomenon the Euphrates then would only support the shifting of the shore south of Fao by depositing its sediments there via the Shatt el Arab. This means that the shifting of shore into the Gulf would proceed more rapidly.

That is why the shifting of the course of the Tigris during the 15. th century cannot be the main reason for the draining of the " Great Swamp". It can rather be assumed that from the year of the flood disaster in 629 A. D. up to our own days the Swamp " receeded" gradually to the southeast as a consequence of the deposition of sediments, a process, as we have seen, that is still going on in Hor al Hammar.

Finally a few words to the flood disaster of 629 A.D. Itself: it is handed down to us as reason that it was beyond man's capacity to repair the dykes after they had bursted. This often conveys the impression that the dykes had been built by man, too. But this seems to be highly improbable, since the distance between Al-Kufa and

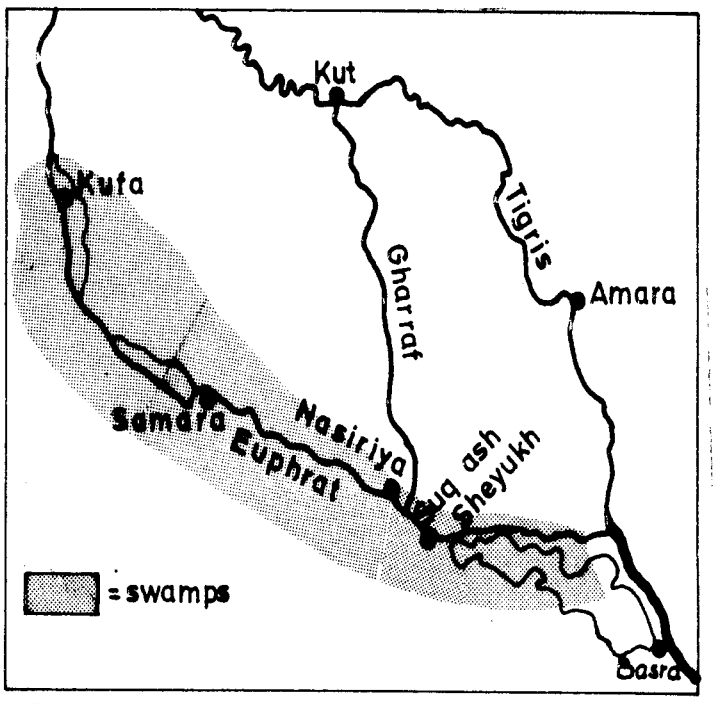

Fig 4 . a -The " Great Swamp"
(Section of the map of Guy le Strange)

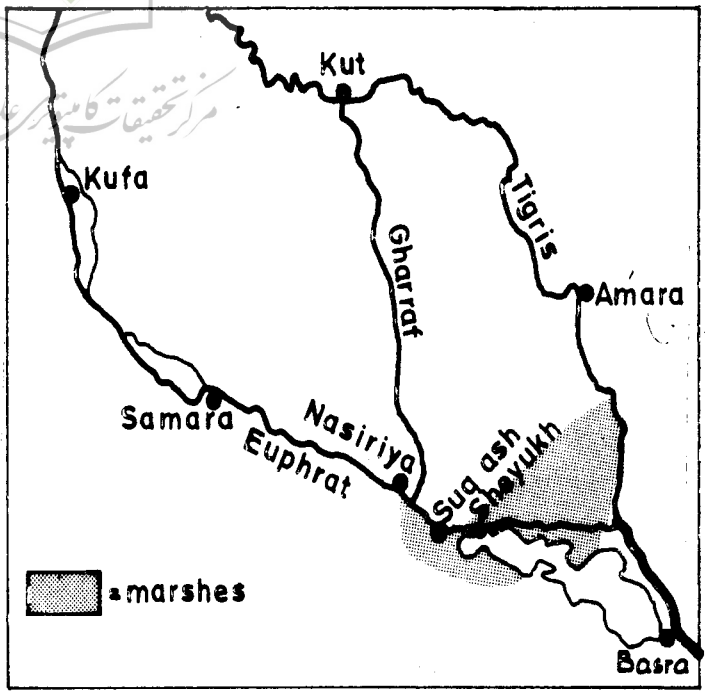

Fig.4 . b The extent of the marshes of to day

Qurna is about 250-300 kilometres. The ability of man to construct dykes of such gigantic dimensions must be put into question, even allowing the extraordinary achievments of ancient man. It is much more likely that the dykes formed themselves in natural ways according to

ion. However, they are located somewhat more south east than Ibn serapion reported them to be. The solution to this problem is that Guy le Strange ought to have placed Wasit somewhat more northeast then he actually did, but in his time the location of Wasit was not yet well – known. Therefore it can be taken for granted that at the time of Ibn Serapion the course of the Tigris led somewhat more to the east than supposed by Guy le Strange. That is why it suggests itself that the course of the Tigris at that time is nearly identical to the course of the " Idigina" of Pre – Sargonic Mesopotamia[7]. Although there are literary references stating that the Tigris of Sassanidic times like its to – day's course led through Amara, it cannot be ruled out that the " Idigina" of pre – Sargonic Mesopotamia is identical to the Tigris as it is described by Ibn Serapion. The shift of the course of the Tigris in Sassanian times may have been only of short duration.

Fig. 3 shows that the antique Tigris course was supposed to be more eastern. Hence its situation was identical to the course of " Idigina " of pre – Sargonic times[8]. It is a scientifically proved fact that it is not before the 15. th century the Tigris shifted its bed in such a way that its definitive course led through present – day Amara. This event caused the decline of Wasit a flourishing trade centre that had been founded even earlier than Baghdad.

This shifting of the Tigris course through Amara in the 15. th century is often pointed out to be the only reason for the draining of the " Great Swamp " after a thousand years by this time and thus making the flooded antique cultural places in the region of the " Great Swamp" accessible again. As there wasn't any longer a water supply of the Tigris this might have caused the

(7) O. E. Dietz, G. Faber, E. Sollberger, Die Orts – und Gewässernamen der präsargnischen und sargonischen Zeit: Re'pertoire Ge'ographique des Textes Cuneiformes, Bd. 1, Wiesbaden 1977, p. 216 / 217.

(8) Dietz, Faber, Sollberger, op. cit., illustrations.

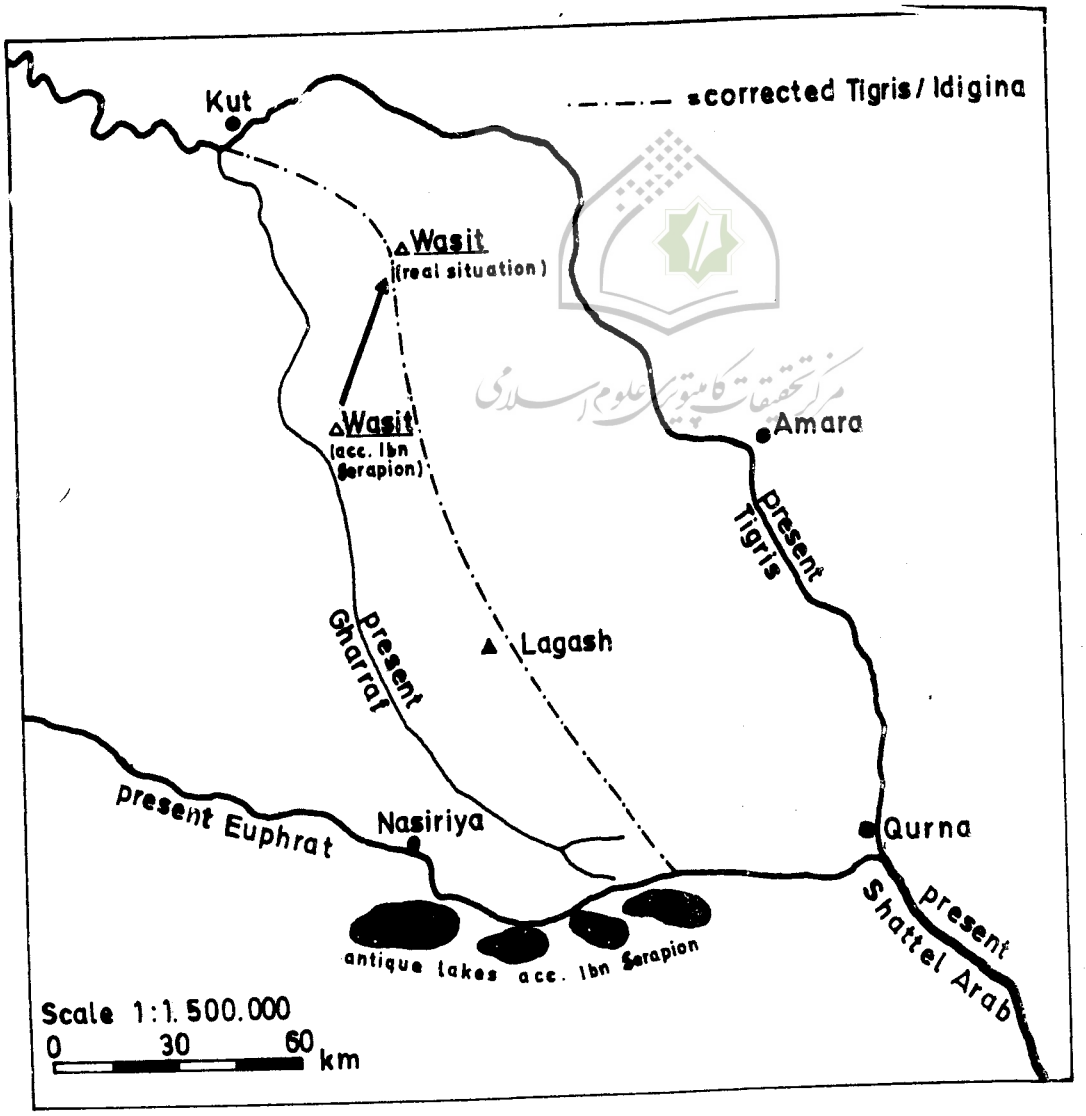

Fig. 3

The course of the antique Tigris / Idigina (acc. G. le Strange; The Arch. Map of Iraq; Dietz / Faber / Sollberger)

flowing into the Swamp south of Al-Kufa[3]. Al-Kufa is situated slightly northeast of present - day Najaf. We can derive from this fact that the ancient Islamic places of Kuhaima, Hiran, and Qadisiya have been situated up to the latitude of Najaf only, since this is the most southerly located place of this region suitable for settlement[4].

Since 626 A. D. i. e. roughly speaking since the beginning of the Islamic period (636 A. D.)the land south of Najaf was covered with swamps.

In this region no early Islamic settlements are to be found, a fact that stresses the reliability of Ibn Serapion's account. IbnSerapion describes the boundaries of the " Great Swamp" as being situated in the region near Qurna[5]. Here the Swamp emptied into the "*blind Tigris*" which is, roughly speaking, the Shatt el Arab of today. That is why from this town southwards up to the Gulf Islamic settlements like Basra were again able to exist.

For about one thousand years the splendid cultural centres of South Mesopotamia had vanished below the " Great Swamp ".

Fig. 1 shows a map, drawn by Guy le Strange in 1895 on the basis of Ibn Serapion's account (cf. the preceeding article " Middle Mesopotamia at the Time of the Caliphates"). The dimensions of this " Great Swamp" that came into existence in 629 are clearly visible. As can be seen in fig. 1 there are located four lakes within this reed - grown Swamp :
Hawr *Bahassa*, Hawr *Bakamsu*, Hawr *Basrayarha*, and Hawr *al - Muhammadiyya*.
To a varying degree these lakes were deeper than the " Great Swamp " itself and therefore they were not over grown with reed[6]. These four adjoining lakes are surely identical to the chain of extreme water depths in Hor al Hammar of today (fig. 2). Figure 2 shows a satellite photograph taken from a hight of 920 kilometres on July 10, 1973. This photograph was taken at a wave - band particularly suited for revealing water- depths, or, to put it in simple terms : The darker the surface appears on the photograph the deeper is the water (Author's note : If one examined some typical light dark - patches on the spot of the marshes and of Hor al Hammar for the actual depth of water one would be able to plot a map of the water depths of this area in a relatively simple way e. g. by means of this satellite photograph).

The arrows marked "A" show the extreme water - depths of present - day Hor al Hammar which are quite probably identical to the lakes described by Ibn Serap-

(3) Guy le Strange, op. it., p. 47 .

(4) The Archaeological Map of Iraq. Republic of Iraq. Directorate General of Antiquities. Baghdad.

(5) Guy le Strange, op. cit., p. 297

(6) Guy le Strange, op. cit., p. 297

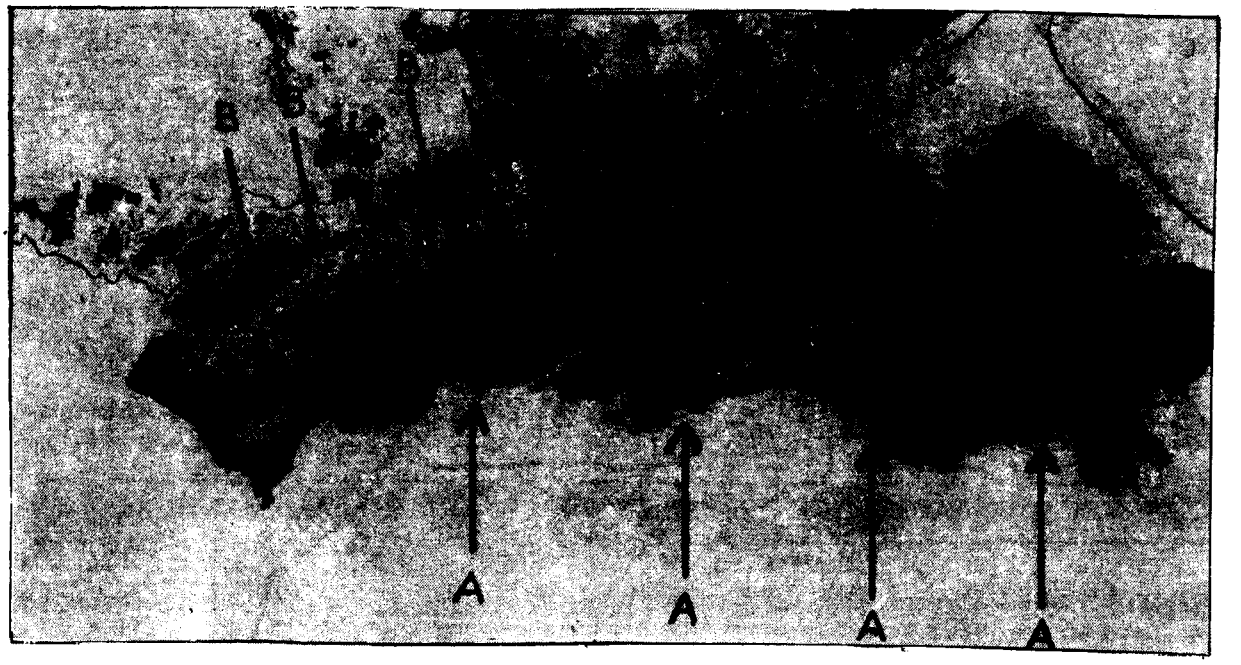

Fig. 2

Satellite photograph showing the extreme water depths in Hor al Hammar and the shallow zones in the marshes

THE END OF THE SOUTH MESOPOTAMIAN CIVILIZATIONS CAUSER BY BURSTINH OF DYKES OF THE EUPHRATES AND TIGRIS IN 629 A. D.

By :
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Bayreuth
GERMANY-WEST

Numerous archaelogical places of South Mesopotamia originating in pre-Christian millenie had nearly continually been inhabitated up to the Sassanian period (226-636 A.D.). Uruk, Larsa, and Girsu are examples of such settlements.

This unbroken line of cultural development startec to wane, however, with the partial bursting of the dykes of the Euphrates and Tigris and, as a result of this incident with the flooding of the lowerlying lands towards the end of the 5.th century A.D. The disaster was completed when in 629 A.D. Such an enormous quantity of water of both the rivers flooded the South Mesopotamian area - that all human existence there became impossible. The dykes, now completely destroyed, were beyond repair; a "Great Swamp" of gigantic extent came into being.

Ibn Serapion[1] provides us with a description of this "Great Swamp" as it looked like about 900 A.D. (fig. 1): At that time the course of the Tigris led through Wasit flowing into the " Great Swamp " south of Al - Katr [2]. According to Ibn Serapion the Euphrates was

(1) Further details cf. the preceeding article : " Middle Mesopotamia at the time of the Caliphates "

(2) Guy le Strange. Description of Mesopotamia and Baghdad, written about the year900 A. D. by IBN SERAPION : in : Journal of the Royal Asiatic Society of Great Britain and Ireland. London 1895. p. 34.

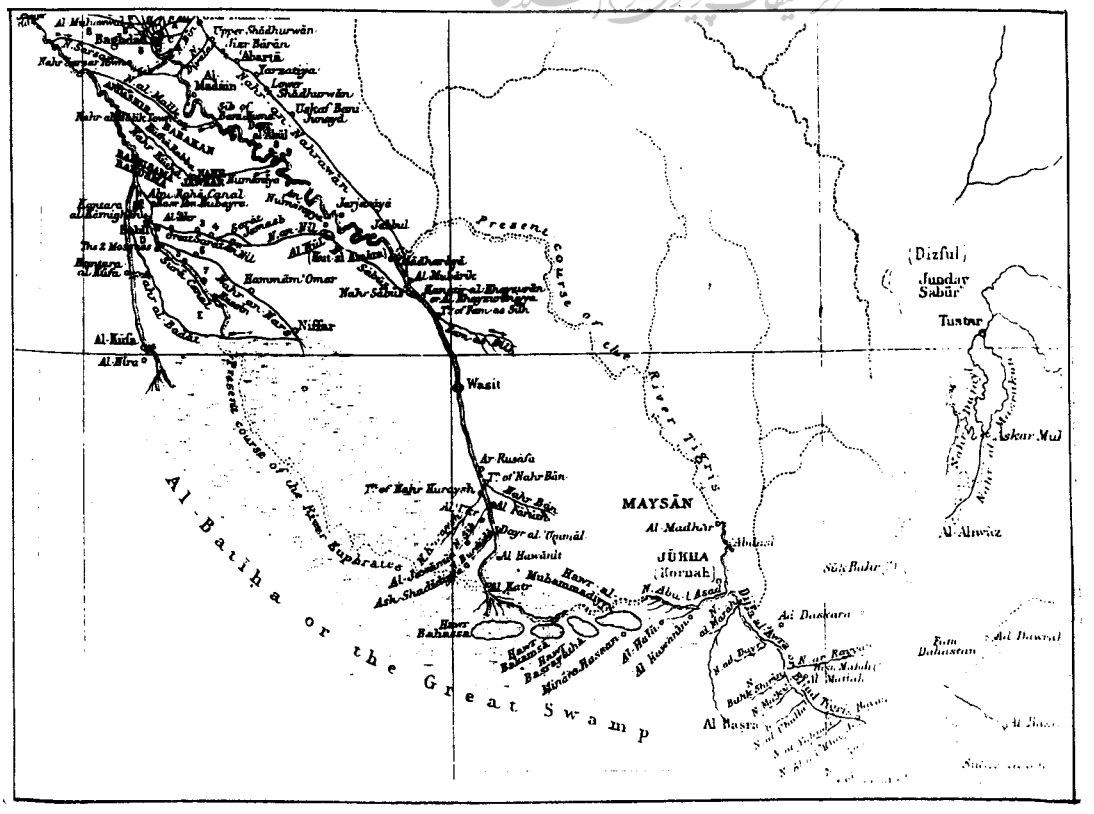

Fig.1
The " Great Swamp" (Section of the map of le Strange) .