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AL MAS'UDĪ ON THE ELEPHANT

To the most outstanding and most interesting of Arabic classical period scholars (9th-11th century) belongs the historian and traveller Abū 'I-Ḥasan 'Alī ibn al-Ḥusayn ibn 'Alī al-Mas'ūdī (born sometime between the years 890-900, died 956), the author of several works of which the most interesting is Murūḡ ad-dahab wa ma'ādin al-ḡawāhir (Golden Meadows and Precious Stonemines). Although this prose is mainly of a historical nature, its first chapters (about 1/5 of the book), are comprised of interesting geographic and ethnographic facts as well as problems dealing with natural science. The part of the work concerning natural science problems has not yet undergone analytical study. The one exception is prof. dr. Andrzej Czapkiewicz's article entitled Al-Mas'ūdī on Balneology and Balneotherapeutics¹; no one has shown interest, however, in al-Mas'ūdī's knowledge of other themes such as, for example, zoology. In the first chapters of the book, one may find descriptions and short references to about 130 animals and animal-by-products. These bits of information, in many cases proving to be based on fact, deserve to be studied more closely.

Al-Mas'ūdī dedicates a relatively great deal of consideration to the free roaming wild African elephants as well as to the domesticated Indian elephants. We may find information concerning these elephants chiefly in chapters XVI, XXXIII, XXIV and CXV of Golden Meadows.

Knowledge concerning the elephant contained in Golden Meadows is valuable, since it is based on the author's personal observations as well as on information obtained from a number of various merchants, sailors and travellers, all of whom were al-Mas'ūdī's contemporaries. As to written sources used by al-Mas'ūdī in regards to the description of the elephant, he quotes information from Aristotle's Natural History of Animals² and, from among Arabic authors, al-Ḡāḥiẓ (868-869), whose Kitāb al-Ḥayawān (Book of Animals) is perhaps dependent of Aristotle's work of the same title. Included in this material, al-Mas'ūdī refers to a very comprehensive scheme of elephant description given by al-Ḡāḥiẓ³. Unfortunately, al-Ḡāḥiẓ did not

realize this promising project in a separate chapter dedicated solely to the elephant, but limited himself to merely a few general remarks concerning the animal.

In regards to the author's own observations, he was able to make them quite easily during distant and sometimes long-lasting travels during which he visited, among other places, towns of the Sind Province on the lower Indus River such as Multān and al-Manṣūra, the land of aṣ-Ṣanī⁴, China, az-Zābaḡ⁵, the towns of Kanbāya, Sindān and Sufāra in "real" India, as well as the town of Ṣaymūr in the Balahrā/Balahray Kingdom⁶.

Al-Mas'ūdī also navigated the Zang Sea⁷ several times, visiting the country of az-Zang⁸ on these occasions.

It may be assumed that al-Mas'ūdī gathered a great deal of information in Baṣra, which was an extraordinarily busy port visited by numerous sailors and merchants, where he spent a major part of his life, as well as from informants whom he met during his many journeys. Al-Mas'ūdī obtained much information about the Indian Ocean's coasts and islands from Abū Zayd as-Sīrāfī, the author of Silsilat at-Tawārīḥ (Chain of History). It is possible that oral information was obtained from as-Sīrāfī as well, this information being of a different nature than that which appeared in Chain of History. Among al-Mas'ūdī's other informants were anonymous inhabitants of Sīrāf and 'Omān as well as anonymous Indian and Zang merchants.

Information collected by al-Mas'ūdī concerning the African and Indian elephant is not only fascinating, but has been confirmed many times by other Arabic writers and travellers⁹. Of course, there are also some statements which we may consider as being highly improbable, but we should not be surprised at this, taking into consideration the era during which they were written; it was the beginning of the 10th century, and some naturalists, as late as the 19th century, shared the same opinion. There are still many tales concerning the elephant circulating today, with some queries remaining unsolved to the present day¹⁰.

Al-Mas'ūdī was aware of the existence of two relatively different species of elephant: one of the two living in East Africa and the second being the one found in India and Sumatra¹¹. The African elephant is of interest to al-Mas'ūdī because of its valuable tusks, and the Indian elephant due to its usefulness as an animal of labor.

THE ELEPHANT IN NATURE

In chapter XXXIII of Golden Meadows, al-Mas'ūdī gives information concerning the African elephant. He states that there are not as many elephants in any other country as in that of az-Zang¹², az-Zang being understood as the coastal regions of present-day Kenya, Tanzania and Northern Mozambique. All of the elephants in

this region, as we read further, roam freely, the Zangs neither taming them nor using them for either farming or warfare purposes, as do the Hindī and inhabitants of the province of Sind. Here, the elephant is hunted only for its tusks, which is accomplished by poisoning the water in a given watering hole with the leaves, branches and bark of a particular tree indigenous to the Zang country. Afterwards, the hunters hide themselves and wait for the elephants' arrival to the hole to drink water. The poisoned water acts upon the elephants by burning their entrails, dazing them to such an extent that the animals fall and are unable to raise themselves, according to al-Mas'ūdī, due to the lack of knee joints in their forelegs. Armed with long spears, the hunters then jump upon the elephants and proceed to kill them. The techniques employed by African hunters of the 10th century are not exactly known, but are presumed to resemble those of the primitive elephant-hunting tribes of the recent past. Among a number of methods described by the eminent elephant expert, R. Carrington, however, I have not found any which would correspond with this technique described by al-Mas'ūdī. Carrington writes about the use of pitfalls, bows and arrows of various sizes and makes, arbalests, snares made of leather line ended with a noose, javelins and throwing-spears, liana nets for stopping elephants in stride, as well as driving of elephants into a swamp and then dispatching immobilized animals, and, finally, the encircling of elephants with fire¹³, but not once mentions the poisoning of water in elephant watering holes. Admittedly, African tribes are known for using vegetable poisons i.e. the kind produced from leaves of the tree Acconthera Shimper, from bark of the Acconthera Fresiorum as well as from seeds of the plant Strophantus Hispidus, but these poisons were applied to spear and arrow heads. This information given by al-Mas'ūdī seems even more incredible, taking into account the fact that the elephant possesses an excellent sense of smell and is unusually cautious, e.g. cases of alimentary intoxication among elephants are extremely rare, even though they often graze at night¹⁴.

According to al-Mas'ūdī, elephant tusks were first sent to 'Omān in Eastern Arabia, from where they were then exported to India and China.

The author of Golden Meadows pays much attention to ivory obtained from the tusks of the wild Zang elephant, which are much larger than those of the Indian elephant¹⁵. According to al-Mas'ūdī, each of the tusks weighs from 150 to 200 manns, one mann being equal to two Baghdad raṭls (1 Baghdad raṭl = 406.25 g). The size of those tusks, states the author, is proportional to the size of the elephant, the wild Zang elephant being many ells taller than the Indian elephant¹⁶.

Large white elephant tusks, exported from the country of Zang, are very valuable and very much in demand, especially in India and China¹⁷. Ivory is used by the Hindī in making helms for daggers called harārī (sing. harrī), as well as hilt-guards for curved swords known as qarāṭīl (sing. qarṭāl). The largest quantity

of ivory is used, however, for making chess pieces and nard i.e. a sort of trick-track.

In China, the most sought after of all elephant tusks are those which are absolutely straight (a true rarity indeed), which are used there in making of litters used to carry kings, higher ranking officers and notables. Officers and notables, writes al-Mas'ūdī, never occur in an iron litter in front of the king, but only in a ceremonial ivory litter. Ivory (obviously that of a worse sort) was also used in China as an incense which was burnt on the altars of pagan gods.

Not only ivory was highly valued in the contemporary world. According to al-Mas'ūdī, the callous skin of the elephant was used to make shields, which were manufactured by the Zang's and Hindi¹⁸. These shields could not compete with the permanent, solidly built elephant skin shields made by the Chinese and Tibetans as well as the Buḡā tribesmen, who lived in the northern part of what is today the Republic of Sudan.

Al-Mas'ūdī writes that, in the country of Zang, elephants have a life-span of about 400 years, this figure being attributed to Zang's who thus explained their unableness to kill an enormous elephant, due to its size, which they once happened upon¹⁹. The question of the life span of the elephant is one which has been heatedly debated for a long time. Most naturalists and travellers of the turn of the 19th century were of the opinion that the African elephant may live from 100 to 200 years. R. Carrington, however, maintains that the elephant has about the same life-span as a man. He further states, that age that has been verified with reasonable certainty is 69 years, and although it is not unlikely, that occasional specimens may survive well into seventies, and perhaps even reach the eighties, the loss of the last molar teeth sometime in sixties would normally precipitate death by starvation²⁰.

According to al-Mas'ūdī, the African elephant is of a grey, black, white or paled colour. In fact, the elephants are light or dark-grey. So-called white elephants (which are not really white but merely pale-grey) are met only in India. They are extremely rare and were worshipped in Siam until quite recently. Illusions concerning other colours may be based on the elephant's habit of throwing dust and soil over its body, thus, depending on the colour of the soil in question, the elephant may appear to be reddish or yellowish. An elephant's wet skin seems to be quite black, whereas patches of skin covered with layers of dried mud with admixtures of salt (elephants apply such coverings for coolness as well as to protect themselves against insects) may, from a distance, give the impression that the elephant is almost completely white²¹.

TRAINED ELEPHANTS

Al-Mas'ūdī pays more attention to the Indian elephant, which is much better known, having been domesticated by the Hindi long ago. The author writes much about this animal and relays various information as to its appearance, nature, character and its work in the service of man.

Thus he reports that in India elephants do not live in the wild state, but that they are all domesticated and used to provide the same services that the ox and camel provide in other countries. They are also trained for warfare. He adds, however, that the Indian elephant lives in meadows and swampy grounds as do buffalos in Muslem countries, avoiding regions which are frequented by the rhinoceros, and do not graze in places where they detect the scent of this animal²². In this manner we come across inconsistencies in al-Mas'ūdī's description of the Indian elephant. If, for instance, all elephants in India were domesticated, then the information concerning their life in swamp would be utter nonsense. As to the elephant's fear of the rhinoceros, this observation is confirmed by many contemporary travellers who are of the opinion that this is due, however, to a rather strong mutual dislike between these large animals; while some old bulls sometimes tolerate the presence of the rhinoceros, cows having young drive them away immediately²³.

The other natural enemy of the elephant, according to al-Mas'ūdī, is the swine²⁴. Most naturalists, from Pliny in ancient times up to and including Buffon in the 17th century, are of the same opinion. The fact is, however, that elephants are generally indifferent to the presence of bush pigs, wart-hogs and other swine²⁵.

Al-Mas'ūdī claims, that Indian elephants live to the age of from 100 to 200 years, and that any given cow normally breeds once in every seven years. Carrington, however, states that a cow, after a gestation period lasting from 19-22 months, usually breeds only one calf. The cow cares for her young with great attention and feeds it even to the age of 5-6 years despite the fact that the calf begins to enrich its food income with green forage already at the age of six months. The same cow, however, generally breeds once every three years²⁶. According to al-Mas'ūdī, one example of the elephant's delicacy of feelings and personal "culture" is the fact, that a male elephant refuses to mate with an already fertilized cow, which, as the author states, is a rarity among animals, with only the camel displaying similar self-restraint²⁷. It is more probable, however, that it is the female which, already feeling pregnancy, repulses her partner to whom she was related during the 3-10 month long mating period, where upon the male leaves her to look for a new partner²⁸.

Adult, sexually mature bulls are periodically afflicted by the emotional state known as musth, of which al-Mas'ūdī writes in the following manner: during a certain

period of the year, sweat, resembling musk, is secreted from the heads and the foreheads of the most brave and fearless elephants. The Hindi collect this secretion, mixing it with valuable fragrant oils, and use this mixture as an agent to increase stimulation, excitement and courage. The largest quantity of this substance is secreted during the rut period and is brought upon by the extreme excitement which in turn transfers into frenzy to such a degree that even the elephants' mahouts and guards, to whom the elephants are very much accustomed, do not have the courage to approach them because the affected elephants are not able to distinguish between friend and foe. During this period, the animals escape into the jungle, sometimes many kilometers, and return only when the crisis has passed. Nevertheless, the excitement does not immediately disappear completely, and for some time afterward the elephants do not behave in their usual way²⁹. According to Carrington, the musth period usually lasts from two to several weeks, although it is known to have lasted for 2, 3, and even 5 months, this having occurred when the males were held in captivity and were deprived of freedom of motion. The symptoms of musth include the swelling of the temples and the secretion of a dark, tar-like, strongly smelling liquid from the temporal glands located midway between the elephant's eye and ear. This period is usually accompanied by extraordinary excitement and irritation. Although the significance of musth and its relation to the elephant's sexual activity has not been fully examined, but it appears, that elephants are sexually active during varying seasons of the year, whereas during the musth period they may be absolutely indifferent towards females and even attack them³⁰.

Al-Mas'ūdī tells of the surprising behaviour of the elephants at a water hole. Here, he relates information obtained from the Hindi who state, that elephants refuse to drink clean, clear water and therefore disturb it with their legs before bending over it to drink. The author explains this strange behaviour as being caused by the elephants' fear of seeing their own reflection on the smooth, mirror-clear surface of the water. He further states, that the elephant, horse and camel are the only large animals which behave in this manner, while others contemplate their reflection with pride and satisfaction³¹.

I was unable to find confirmation of this fact in contemporary natural science monographs. On the contrary. L. Żyrkiewicz, in his book dedicated solely to the theme of the African elephant, states, that elephants, in contrast to some other animals (e.g. rhinoceros), do all in their power in order to quench the thirst with possibly clear, undisturbed water³².

The author of Golden Meadows also pays some attention to the construction of the elephants trunk. He states³³, that the trunk is in fact the elephant's nose, and is simultaneously used by the animal to carry food and water to its mouth. The trunk is also used for fighting as well as to produce some of the characteristic sounds

by which the elephant expresses its wants and feelings. Al-Mas'ūdī describes these sounds as incompatible with the elephant's solid posture and dignified appearance. The trunk of the elephant, he says, is built of gristle, muscles and nerves. According to contemporary knowledge, the elephant's trunk is a very elongated upper lip coalescent with the nose and is composed of about 5000 muscles. The trunk is a very sensitive organ having on its end one (in the case of the African elephant, two) prehensile appendix, called a "finger", which enables the picking up of even very small objects³⁴.

While the description of the trunk, as given by al-Mas'ūdī, is more or less precise, the information which he gives about the elephants' tongue is absolutely imagined. The author, probably quoting stories heard from Hindi mahouts, states that, unlike other animals whose base of the tongue is directed inwardly while the top outwardly, the elephant has the top of its tongue directed inwardly. Hindi believe that, if not for this feature, elephants could be trained to speak³⁵.

Further on, al-Mas'ūdī states that Indian elephants are extremely valued due to their unusual physical features. Hindi also credit the elephant with almost human intelligence, emotional delicacy and culture. Among physical features which make the elephant an outstanding animal, Hindi mention its impressive height (al-Mas'ūdī gives the average height of an Indian elephant as being from 9 to 10 ells, some even obtaining the height of 12 ells³⁶) solid body structure, longevity, the size of its ears and penis, its trunk as well as the weak voice that comes from it and, finally, the lightness of its gait in spite of a huge and ponderous body³⁷. According to the opinion of the author of Golden Meadows, a man riding on the back of an elephant does not feel the elephant's pacing in the least, and the gentleness and regularity of the animal's gait lulls the passenger to sleep.

This lightness and regularity of the elephant's gait, so admired by the Hindi, may be explained by the fact that, contrary to the horse, whose arrangement of the legs is completely different when galloping as opposed to when trotting, the elephant always moves in the same manner i.e. without changing the arrangement of its legs, the speed of its movement determined only by the length of the steps it takes. According to the English authors who attempted to put such terminology in order, the elephant uses two steps: "walk" and "amble". In both instances, the arrangement of the elephant's legs is identical: the elephant simultaneously rises and lowers either both left or both right legs, the front leg touching the ground slightly earlier than the back one. The elephant's jog-trot shows some peculiarity; hypodermic pillows of springy tissue, which forms the soles of elephant's feet, expand and protrude visibly when the elephant rises its legs. These pillows act as a sort of shock absorber which, under the heavy weight of the elephant, enable it to step silently and make its steps light and springy. When the leg is pressed to the ground, the pillow flattens out again, spreading the animal's weight over a broader surface³⁸.

There are many stories concerning the intelligence and wisdom of both the war elephants and those used in labour. Al-Mas'ūdī quotes here³⁹ the story of a war elephant belonging to the stables of the king of al-Manṣūra, whose deeds made him world famous. This elephant, called M.n.f.r.q.l.s, neither drank nor ate for several days, sighed and shed tears, as does a suffering man, upon the death of one of his mahouts to whom he was very much attached. On another occasion, this same elephant, having left the stables leading the remaining 80 elephants, wandered onto one of the narrow streets of al-Manṣūra, where he came upon a woman totally unprepared for such an encounter. Terrified, she fell on her back simultaneously, but unintentionally, uncovering the private parts of her body. When M.n.f.r.q.l.s saw this, he stopped, barring the way of the other elephants, and, using his trunk, covered the woman with her clothes and motioned her to get up. Only after her departure M.n.f.r.q.l.s led the elephants along their way. According to another story concerning the Persian king Abarwīz (Parviz, 7th century), he had in his stable 1000 Indian elephants "whiter than snow", among which the largest reached 12 ells in height. One day Abarwīz left to inspect his army, equipment and weapons. Upon his appearance, all of the elephants went down on their knees in front of him and did not rise their heads nor stretch their trunks until the mahouts talked to them in the Hindi language and drew them away with ropes. Delighted by this occurrence, Abarwīz exclaimed: "May the elephants be Persian, not Indian. What proof they give of their intelligence and education!"⁴⁰

In India, elephants were used as animals of labour and performed many activities: they pulled carts, carried heavy loads, were used as saddle-horses, as well as to thresh rice and other grain, which, as the author stated, was similar to "threshing by oxen, that work on the threshing-floor"⁴¹. Of most value, however, were those elephants trained for war, their numbers being a measure of the strength and power of Eastern countries. Accordingly, al-Mas'ūdī, speaking of the powerful ruler of the Indian country of Balahrā or Balahray, under which name is hidden the southern Indian kingdom of Valabhi, mentions that he has been the owner of a great number of fighting elephants. The king of Rahmā country, which probably bordered the Balahray kingdom from the west⁴², owned 59 thousand elephants⁴³. The king of the city and country al-Manṣūra, located in the province of as-Sind, possessed 80 war elephants⁴⁴, and in Qanūḡ kingdom, which is the old historical kingdom of Kanyakubga on the Ganges, there were two thousands such elephants⁴⁵.

War elephants, according to al-Mas'ūdī, had to be active and daring, well placed and mounted by a skilled rider. A certain type of sword, called al-qartal, was attached to the elephant's trunk which was covered by a coat of mail, the entire elephant's body being dressed in armour made of ivory and iron. Five hundred foot-soldiers were located at elephant's flanks, their tusk being to guard and defend

the animal from the rear. Such elephants, says the author, were able to fight against 6000 riders, whose rows they had invaded⁴⁶.

Very interesting is the information that elephants are afraid of cats from whom they flee. Al-Mas'ūdī says, that Persian kings, when wanting to frighten the elephants of a hostile army, released a swarm of cats among them. The author adds, that this strategy was still practised during his life time i.e. during the first half of the 10th century, by the rulers of as-Sind as well as Hindi kings. In respect to this procedure, he quotes⁴⁷ an anecdote about the Muslim fighter and poet Hārūn ibn Mūsā, who terrorized the province of as-Sind. Hārūn b. Mūsā lived in his fortress which was located near Multān, and it was here that he was once attacked by the army of a Hindi king led by several elephants. Hārūn b. Mūsā, running towards the biggest elephant of the hostile army, threw a cat at it, which caused not only a panic and retreat of the elephants but also the death of the Hindi king. Unfortunately, I was unable to find any information in any of the European studies, which could confirm the elephants' dread of cats.

The comparison of information about elephants as presented in al-Mas'ūdī's Golden Meadows with contemporary scholarly data shows that the knowledge of this author of 10 centuries ago is surprisingly broad and precise. The only completely false information is that which concerns the elephant's tongue; all other data, even though differing in various degrees from the objective truth, are based on some exaggeration (e.g. regarding height, size of tusks and life-span) or on the attributing the elephant with the features of human mentality (e.g. the sexual indifference towards pregnant females). Similar notions were in vogue up until the mid 19th century. Only contemporary natural science has criticized many ideas concerning the elephant, simultaneously introducing many specifications regarding, for example, the elephant's body structure, life cycle, etc. Natural science has also explained the reasons for the particular way in which the elephant's organism functions. Nevertheless, upon comparing al-Mas'ūdī's knowledge with that of modern-day natural science, one must admire this author's criticism and scrupulousness in collecting materials on which he based Golden Meadows, since these qualities were uncommon in the 10th century.

Notes

¹ Folia Orientalia III(1961), pp. 271-275.

² Maçoudi, Les Prairies d'or. Texte et traduction par Barbier de Meynard et Pavet de Courteille, vol. III, Paris 1864, p. 26.

³ Ibidem, pp. 22-23.

- ⁴ Arabic name for the medieval kingdom of ^XChampa in the present-day Vietnam.
- ⁵ Medieval Arabic name applied either to Sumatra or to the whole western Indonesia.
- ⁶ The Indian pagan kingdom of Valabhi, laying in the southern part of India.
- ⁷ The part of the Indian Ocean washing the coasts of the eastern Africa.
- ⁸ The eastern coast of Africa from the Somali peninsula in the north to the northern Mozambique in the south.
- ⁹ See: J. Ruska (Ch. Pellat), *FTI* [in:] *Encyclopédie de l'Islām*. Nouvelle édition, vol. II, Leyde-Paris 1965, pp. 913-914. See also: Gabriel Ferrand, *Relations de voyages et textes géographiques arabes, persans et turks relatifs à l'Extrême Orient du VIII^e au XVIII^e siècles*. Traduits, revus et annotés par G. Ferrand, vol. I, Paris 1913, pp. 28-31, 36, 42-43, 72, 79, 94; vol. II, Paris 1914, pp. 490, 561 (10), 728; Adnre Miquel, *La géographie humaine du monde musulman jusqu'au milieu du 11^e siècle*, vol. II, pp. 64(2), 95-96, 106, 109, 189.
- ¹⁰ E.g. connection of musth with sexual activity of male elephants. See: R. Carrington, *Elephants, a short account of their natural history, evolution, and influence on mankind*, Edinburgh 1968, p. 50.
- ¹¹ It is considered at present, that the African and the Indian elephant do not belong to the same genus of *elephas*, but they are the species belonging to the two different genera. Thus the African elephant bears the name of *Loxodonta africana*, and the Indian elephant — of *Elephas maximus*. See: Leonard Żyrkiewicz, *Na tropach stonia afrykańskiego*, Warszawa 1968; Carrington, *op.cit.*, pp. 22-25.
- ¹² Maçoudi, *op.cit.*, vol. III, pp. 7-9.
- ¹³ Carrington, *op.cit.*, p. 145.
- ¹⁴ See also: Żyrkiewicz, *op.cit.*, pp. 35, 118.
- ¹⁵ Maçoudi, *op.cit.*, vol. II, Paris 1863, pp. 230-231.
- ¹⁶ See: Żyrkiewicz, *op.cit.*, pp. 14-15; Carrington, *op.cit.*, pp. 136-138.
- ¹⁷ Maçoudi, *op.cit.*, vol. III, pp. 8-9.
- ¹⁸ Maçoudi, *ibidem*, p. 18.
- ¹⁹ Maçoudi, *ibidem*, p. 11.
- ²⁰ Carrington, *op.cit.*, pp. 42-43.
- ²¹ Żyrkiewicz, *op.cit.*, pp. 18-19.
- ²² Maçoudi, *op.cit.*, vol. I, Paris 1861, p. 385.
- ²³ Żyrkiewicz, *op.cit.*, p. 78; Carrington, *op.cit.*, p. 76.
- ²⁴ Maçoudi, *op.cit.*, vol. III, p. 14.
- ²⁵ Carrington, *op.cit.*, p. 76.
- ²⁶ *Ibidem*, pp. 49, 52.
- ²⁷ Maçoudi, *op.cit.*, vol. III, p. 60.
- ²⁸ Carrington, *op.cit.*, pp. 53-54; Żyrkiewicz, *op.cit.*, p. 57.
- ²⁹ Maçoudi, *op.cit.*, vol. III, pp. 57-58.
- ³⁰ Carrington, *op.cit.*, pp. 30, 50; see also: Żyrkiewicz, *op.cit.*, pp. 63-64.
- ³¹ Maçoudi, *op.cit.*, vol. III, pp. 59-60.
- ³² Żyrkiewicz, *op.cit.*, p. 35.

- ³³ Maçoudi, *op.cit.*, vol. III, p. 18.
- ³⁴ Carrington, *op.cit.*, p. 30; Żyrkiewicz, *op.cit.*, pp. 21-22.
- ³⁵ Maçoudi, *op.cit.*, vol. III, p. 21.
- ³⁶ Al-Mas'ūdī, who had lived in Bagra for a long time, has surely meant the legal Baghdad ell, which was established by the caliph al-Ma'mūn in the first half of the 9th century. This ell measured 48.25 cm. See also: W. Hinz, *Dhira'* [in:] *Encyclopédie de l'Islām*. Nouvelle édition, vol. II, Leyde-Paris 1971, pp. 238-239.
- ³⁷ Maçoudi, *op.cit.*, vol. III, p. 21.
- ³⁸ See: Żyrkiewicz, *op.cit.*, p. 13.
- ³⁹ Maçoudi, *op.cit.*, vol. I, pp. 379-380.
- ⁴⁰ Maçoudi, *op.cit.*, vol. II, p. 231.
- ⁴¹ Maçoudi, *op.cit.*, vol. I, pp. 380-381; corn threshing in the East was accomplished by trampling sheafs laying on the threshing-ground.
- ⁴² As to the identification of the country of Rahmā see: Ch. Pellat, *Mas'ūdī. Les Prairies d'or*, vol. I, Paris 1962, p. 154; A. Herrmann, *Atlas of China*, Cambridge, Massachusetts 1935, pp. 34-35; *Al-Mas'ūdī, Millenary Commemoration Volume*, ed. S. Maqbul Ahmad and A. Rahman, Calcutta 1960, p. 110.
- ⁴³ Maçoudi, *op.cit.*, vol. I, pp. 384-385.
- ⁴⁴ *Ibidem*, p. 379.
- ⁴⁵ *Ibidem*, p. 375.
- ⁴⁶ *Ibidem*, p. 375.
- ⁴⁷ Maçoudi, *op.cit.*, vol. III, p. 14.