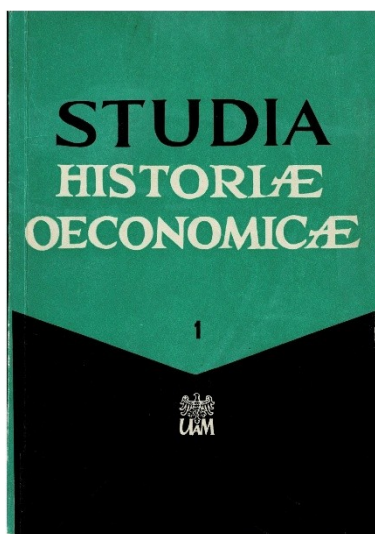




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CHANGES IN THE STRUCTURE AND PRODUCTIVITY OF CATTLE BREEDING IN CENTRAL POLAND IN MODERN TIMES

Too little attention was paid in research concerned with the rural economy of Poland, pertaining both to the Middle Ages and to Modern Times, to the enormous importance of cattle breeding. Cattle was for many centuries the basis of rural economy as a whole. Possession of cattle or lack of it was to a great degree a decisive factor in the development or decline of a given farm. No wonder then that in the opinion of the people cattle was rather often associated with abundance or even richness of a sort¹.

I omit here the complicated problem whether very long, a few thousand years ago the domestication of cattle was mainly aimed at providing meat, milk or farm work. On the other hand, it can be easily established that almost till the beginning of the nineteenth century in almost the whole territory of Poland the main objective of cattle breeding was providing draft animals to the farm and that meat and milk production and fertilizing played a minor role. In spite of that, both in the Middle Ages² and in later times³, apart from the breeding of oxen, cow breeding played a considerable role.

¹ This problem was presented in the Polish ethnological subject literature in a very interesting way by S. Ciszewski: *Prace etnologiczne* (Bydło i zboże a majątek), (*Studies in Ethnology — Cattle and Corn as Indices of Wealth*), t. II, (vol. II). Warszawa 1929, pp. 121—150.

² H. Łowmiański: *Podstawy gospodarcze formowania się państw słowiańskich*, (*The Economic Foundations of the Formation of Slavonic States*), Warszawa 1953; A. Rutkowska-Płachcińska: *Uwagi o gospodarce hodowlanej w Polsce w XIII i XIV w.* (*Some Remarks about the Cattle Breeding Economy in Poland in the Thirteenth and Fourteenth Centuries*). *Przegląd Zachodni*, vol. XI, 1955, Nos 3/4; H. Dąbrowski: *Rozwój gospodarki rolnej w Polsce od XII do połowy XIV wieku*; (*The Development of Rural Economy in Poland from the Twelfth to the Half of the Fourteenth Century*), *Studia z Dziejów Gospodarstwa Wiejskiego*, Vol. V, 1962, No 1; S. Chmielewski: *Gospodarka rolna i hodowlana w Polsce w XIV i XV w.* (*Rural and Livestock Breeding Economy in Poland in the Fourteenth and the Fifteenth Centuries*) *ibid.* Vol. V, 1962, No. 2.

³ Subject literature of cattle breeding in Poland in the Sixteenth, Seventeenth

The history of rural economy of the period of manorial agriculture and serfdom is mostly viewed from the angle of the most representative sources referring to manorial conditions. This probably causes the tendency of belittling the significance of animal breeding, particularly cattle breeding in the periods under discussion. Cattle breeding, however, had a different significance for manorial economy, as the Polish manor had no need to maintain its own draft animals for farm work, and a quite different significance for the peasant's farm which had to supply draft animals not only for its own use, but also for working off the *corvée* ⁴.

In the fifteenth and the sixteenth centuries cattle breeding developed rather well in the discussed area ⁵, oxen as well as cows. A sharp decline

and Eighteenth Centuries is discussed by B. Baranowski and Z. Libiszowska: *Status i potrzeby badań nad historią hodowli w Polsce w XVI—XVIII wieku (Status and Desiderata of Research on the History of Livestock Breeding in Poland in the Sixteenth, Seventeenth and Eighteenth Centuries)*, *Studia z Dziejów Gospodarstwa Wiejskiego*, vol. II, 1959.

⁴ W. Pruski: *Hodowla bydła i owiec w naszej literaturze periodycznej końca XVIII i początków XIX stulecia (Cattle and Sheep Breeding in our Periodicals of the End of the Eighteenth and the Beginning of the Nineteenth Centuries)*, *Przegląd Hodowlany*, vol. IV, 1930, No. 12; F. Bujak: *Ze studiów nad rolnictwem polskim XVI w. (Chów bydła w księstwie oświęcimskim i zatorskim)*, (*From the Studies of Polish Agriculture in the Sixteenth Century Cattle breeding in the Duchies of Oświęcim and Zator*), *Sprawozdanie z Czynności i Posiedzeń Polskiej Akademii Umiejętności*, vol. XXXVI, 1931, No. 8; J. Bergerówna: *Z dziejów książki gospodarskiej w Polsce — Studium o Anzelmie Gostomskim*, (*From the History of Polish Agricultural Books — A Study on Anselm Gostomski*), Lwów 1933; by the same author: *Księżna Pani na Kocku i Siemiatyczach*, (*The Duchess of Kock and Siemiatycze*), Lwów 1936; S. Inglot: *Produkcja roślinna i zwierzęca na Dolnym Śląsku w drugiej połowie XVI wieku. (Vegetable and Animal Production in Lower Silesia in the Second Half of the Sixteenth Century)*, Sobótka, vol. VIII, 1954; by the same author: *Gospodarstwo folwarczno-pańszczyźniane od XVI do XVIII wieku na podstawie dawnej literatury rolniczej*, (*The Economy of the Manor before the Abolition of Serfdom from the Sixteenth till the Eighteenth Century in the Light of the Old Agricultural Publications*), Introduction to the Book by K. Kluk: *O rolnictwie (On Agriculture)*, Wrocław 1951; A. Podraza: *Gospodarka hodowlana w świetle dzieł rolniczych J. K. Haura*, (*Livestock Breeding Economy in the Light of Works on Agriculture by J. C. Haur*), *Zeszyty Naukowe Uniwersytetu Jagiellońskiego* No. 6, Kraków 1961; by the same author: *Jakub Kazimierz Haur pisarz rolniczy z XVII wieku — studium z dziejów polskiej literatury*, (*James Casimir Haur, An Agricultural Writer of the Seventeenth Century — A Study in the History of Polish Literature*), Wrocław—Warszawa—Kraków 1961.

⁵ J. Topolski: *O literaturze i praktyce rolniczej w Polsce na przełomie XVI i XVII wieku*, (*On the Literature and Practice of Polish Agriculture at the Turn of the Sixteenth and Seventeenth Centuries*), *Roczniki Dziejów Społecznych i Gospodarczych*, vol. XIV, 1953; by the same author: *Gospodarstwo wiejskie w dobrach arcybiskupstwa gnieźnieńskiego od XVI do XVIII wieku (Rural Economy in the Estates of the Archbishopric of Gniezno from the Sixteenth till the Eighteenth*

followed at the half of the seventeenth century. War destructions and military requisitioning caused a decrease of the number of cattle. There was an increase again at the end of the seventeenth century. The wars of the beginning of the eighteenth century together with the calamities caused by epizooty (1710—1718) accounted for the decline of cattle breeding in the discussed area. Probably in 1710—1720 the number of cattle was the lowest since the Middle Ages. Lack of cattle and particularly of oxen caused a general decline in rural economy. In the following years, however, there was a slow increase in the number of cattle.

At the end of the eighteenth century in the whole area of eastern Great Poland (the Sieradz and Łęczyca voivodeships) there were 600 cattle for each 1000 of population. In terms of one square kilometer there were ca. 14 cows per square kilometer. In Masovia cattle breeding was not so highly developed and the ratio was 500 cattle per 1000 of population, and 9 cattle per square kilometer respectively. In northern Little Poland there were ca. 550 cattle per 1000 inhabitants and 12 cattle per one square kilometer. It may be pointed out as an example and for comparison that in Southern Poland (territories annexed by Austria in the first partition of Poland) there were in 1773 ca. 600 cattle per 1000 inhabitants and 18 cattle per square kilometer⁶. In the densely populated

Century), Poznań 1958; B. Baranowski: Hodowla bydła w drugiej połowie XVII i w XVIII wieku w Łęczyckim i na terenach sąsiednich, (*Cattle Breeding in the Second Half of the Seventeenth and in the Eighteenth Century in the Łęczyca District and Adjacent Territories*), Studia z Dziejów Gospodarstwa Wiejskiego, vol. I, 1957; by the same author: Gospodarstwo chłopskie i folwarczne we wschodniej Wielkopolsce w XVIII wieku (*Peasant and Manorial Economy in the Eastern Part of Great Poland in the Eighteenth Century*), Warszawa 1958; A. Sucheni—Grabowska: Materiały do dziejów kultury materialnej chłopów w województwie sieradzkim i ziemi wieluńskiej w XVI wieku (*Materials for the History of Material Culture of the Peasants in the Sieradz Voivodeship and the Region of Wieluń in the Sixteenth Century*), Studia z Dziejów Gospodarstwa Wiejskiego vol. II, 1959; A. Wyczański: Studia nad folwarkiem szlacheckim w Polsce w latach 1500—1580, (*Studies on the Gentlemen's Manor in Poland from 1500 till 1580*), Warszawa 1960; L. Żytowicz: Studia nad gospodarstwem wiejskim w dobrach kościelnych w XVI wieku (*Studies in the Rural Economy of the Ecclesiastical Estates in the XVI Century*) Warszawa 1952; W. Szczygielski: Produkcja rolnicza gospodarstwa folwarcznego w Wieluńskim od XVI do XVIII wieku (*Agricultural Production of the Manorial Estate in the Region of Wieluń from the Sixteenth till the Eighteenth Century*), Łódź 1963.

⁶ Estimates arrived at on the basis of Austrian statistical data of 1773 after publications: A. J. Brawer: Galizien wie es an Österreich kam (*Galicia as it Came to Austria*), Leipzig—Wien 1919, p. 67; S. Mandecki: Organizacja zbytu trzody chlewnej w Polsce (*The Organization of the Marketing of Pigs in Poland*), Kraków 1937 p. 21; H. Madurowicz and A. Podraza: Regiony gospodarcze Małopolski zachodniej w drugiej połowie XVIII wieku (*Economic*

Silesia the ratio was near the end of the eighteenth century 450 cattle per 1000 inhabitants and 17 cattle per square kilometer⁷. In Western Pomerania at the end of the eighteenth century the ratio was 550 cattle per 1000 inhabitants and 9 cattle per square kilometer.

Approximately it may be assumed that in the discussed area oxen constituted 34—40% of the cattle, cows 30—35% and calves, heifers and young oxen 25—30% respectively. Bulls constituted ca. 0.7—0.9% of the cattle. The surplus of oxen over the cows was comparatively small. We must remember, however, that for the rural economy of that time the significance of oxen was much greater than that of cows. The most important objective of cattle breeding in those times was providing draft animals for land cultivation. On the other hand, production of dairy products and meat and also of dung did not play a fundamental role. Breeding of cows was also characterized by provision of oxen as one of its most important objectives. It would be also dangerous enough to draw any conclusion from the number of cows and oxen. Although the predominance of oxen in cattle breeding was not very marked, we should take into consideration that the weight of an ox was 40% bigger than that of a cow and thus we shall get a much greater difference in terms of kilogrammes. If we also take into consideration the fact that the feeding of oxen is much more intensive, we shall see that the difference in terms of the use of fodder will be still more pronounced. Thus we could risk a proposition that in those time the breeding of cows was actually an auxiliary department of the most important branch of cattle breeding, i. e. of the breeding of oxen.

In central Poland the breeding of local, short legged, one-coloured red, brown or black cattle was predominant (*Bos taurus brachyceros*). Mixed breeds of all sorts and of varied colour however, constituted a large part of the cattle. Large numbers of oxen were imported to

Regions of Western Polonia Minor in the Second Half of the Eighteenth Century), Wrocław—Kraków 1958, p. 90.

⁷ Estimates arrived at on the basis of Prussian statistical data discussed by L. Straszewicz: Stan i rozmieszczenie hodowli na Śląsku w drugiej połowie XVIII wieku (*The Status and Distribution of Livestock Breeding in Silesia in the Second Half of the Eighteenth Century*), Czasopismo Geograficzne, vol. XXVII, 1956; Historia Śląska (*The History of Silesia*) vol. I, Wrocław—Warszawa—Kraków 1963, part III; J. Janczak: Rozmieszczenie produkcji roślinnej i zwierzęcej na Śląsku na przełomie XVIII i XIX wieku (*The Distribution of Plant and Animal Production at the Turn of the Eighteenth and Nineteenth Centuries*), Wrocław—Warszawa—Kraków 1964; by the same author: Problem siły pociągowej na Śląsku pod koniec XVIII i w pierwszej połowie XIX wieku (*The Problem of Agricultural Traction in Silesia at the End of the Eighteenth and in the First Half of the Nineteenth Century*), Śląski Kwartalnik Historyczny Sobótka, Yearbook XXI, 1966, No. 1.

those territories from the Ukraine from the sixteenth till the eighteenth century. That was a long-horned, gray, steppe cattle (*Bos taurus primigenius*). That cattle was much bigger than the local one. It was very highly prized draft cattle. It was very sturdy, too. It was not finical about fodder, resisting difficult climate and diseases. It was not good, however, for dairy production. Mostly oxen were imported from the Ukraine, but sometimes also cows were imported and in that period the influence of the steppe cattle was very significant.

Approximately since the seventeenth century black-and-white Frisian cattle was also imported to those areas. That breed of cattle is called Dutch in Poland. The crossbreeds of that cattle with the local one yielded special types of cattle, reared in some parts of the area. Pure Frisian cattle was reared only in a few estates of big land owners. King John Sobieski had his model 'Dutch' herd in his residence at Wilanów near Warsaw at the end of the seventeenth century. In well governed cow-sheds in the estates of some magnates the Frisian cattle produced great quantities of milk. However, in the primitive conditions in which the local cattle was bred the Frisian cattle quickly degenerated and even died out. No wonder then that in many estates the 'Dutch' herds were liquidated⁸.

The small local cows weighed on the average ca. 180—200 kilogrammes and the oxen ca. 250—280 kilogrammes respectively. When killed a cow yielded ca. 80—100 kilogrammes of meat and an ox ca. 120—140 kilogrammes. Milk productivity of that cattle was rather small too. On the average one good cow yielded in the eighteenth century 19—23 kilogrammes of butter and 50—60 kilogrammes of cheeses. For the production of such a quantity of butter, before the use of separators it was necessary to use ca. 600—720 litres of milk. The yield of inferior cows, however, was estimated to be only one half or one fourth of that figure. Thus we have to assume that the average yield of milk from one cow was in the eighteenth century in the discussed areas ca. 500 litres per year⁹.

To a reader accustomed to contemporary quotas of cattle breeding production the above cited figures must be surprising. One must re-

⁸ This problem was partly attempted at by: A. Barański: *Historia bydła krajowego* (*The History of the Aboriginal Cattle of Poland*), Lwów 1887; S. Pawlik: *Zapiski do historii bydła rogatego w Polsce* (*Notes on the History of the Horned Cattle in Poland*), Lwów 1909; by the same author: *Hodowla bydła rogatego w Polsce w zarysie* (*An Outline History of Horned Cattle in Poland*), Lwów 1925.

⁹ Much material for the study of this problem is supplied by the archives of the former latifundia of the Polish magnates. This problem was dealt with rather extensively by B. Baranowski: *Zanik tradycyjnego chowu krów na terenie województwa łódzkiego* (*The Disappearance of the Traditional Cattle Breeding in the territories of Lodz voivodeship*), Łódź 1966 (publication expected soon).

member, however, the small weight of that cattle. Thus in terms of 100 kilogrammes of live weight the difference between the poorly fed cattle of those times and the cattle of today is not so essential. It must be added that then and in recent times too, wherever the small cattle was bred in primitive conditions the production of milk per annum was more or less the same¹⁰.

At the end of the eighteenth century in the territories of central Poland oxen constituted ca. 65% of all the draft animals and horses 35%.

After the wars of the beginning of the nineteenth century the number of cattle in central Poland decreased very much. Then it started to increase, e. g. in the territories of the so called Kingdom of Poland there were 1200 thousand cattle in 1822, 1680 thousand in 1848 and 2000 thousand in 1860, i. e. there were less than 10 cattle per square kilometer in 1822, 13 cattle in 1848 and 16 cattle in 1860. In terms of the cattle-number and population ratio there were for each 1000 inhabitants 350 cattle in 1822, 357 in 1848 and 410 in 1860¹¹.

¹⁰ E.g. the average milk yield of the highland cattle of Dagestan was recently ca. 624 kilogrammes a year (S. I. Guseinow: *Gorskij skot Dagestana i puti jego preobrazovanija*, Moskva 1961, p. 10). The average milk yield in peasant farms in 1925—1926 was 560 kilogrammes a year (P. I. Kopiejko: *Krupnyj rogatyj skot Jakutskoj ASSR i puti jego uluczshenija*, Jakutsk 1955, p. 51. In Russia and Belorussia in the Nineteenth Century the annual milk yield of the badly fed cows of those regions was estimated to be 400—800 litres and in the Pripet region as recently as in the twenties of this century cows yielded 700—900 litres) cf. e.g. L. Cybulski: *Uwagi nad stanem hodowli bydła rogatego w guberniach mińskiej i wileńskiej (Some Notes on the Status of Cattle Breeding in the Minsk and Wilno Governorships)*, Warszawa 1902, p. 31; F. Baranek: *Poliska rasa wielkoj rohatoj skatyny, (The Race of the Big Cattle of the Pripet Region)*, Kyjiw 1927, p. 9; A. A. Kałantor and A. W. Ozjerow: *Białoruskij skot*, Moskva 1928, p. 148 ff.; F. Wynjavskij: *Poliska potoczna chudoba, (The Ordinary cattle Breeding of the Pripet Region)*, Kharkiv 1931, p. 11 ff.; F. I. Rieznikov: *Istorija chołmogorskogo skotowodstwa (The History of Cattle Breeding of the Kholmogorsk Region)*, Arkhangelsk 1947, p. 45 ff. As far as Bulgarian conditions are concerned cf. N. Platikanoff, P. Ivanoff, I. Ignatoff: *Gowedowätstwo, (The Cattle Breeding)*, Sofija 1950, p. 21 ff.

¹¹ W. Grabski: *Historia Towarzystwa Rolniczego 1858—1861 r. The History of the Agricultural Association in 1858—1861*, vol. I, Warszawa 1904; I. Kostrowicka: *Stan hodowli zwierząt gospodarskich w Królestwie Polskim przed uwłaszczeniem (The Status of Livestock Breeding in the Kingdom of Poland before the Abolition of Serfdom)*, Zeszyty Naukowe Szkoły Głównej Planowania i Statystyki, Warszawa 1958, No. IX; T. Sobczak: *Stan ilościowy hodowli w regionie łódzkim w XIX wieku (The Quantitative Status of Livestock Breeding in the Region of Lodz in the Nineteenth Century)*, Łódzkie Studia Etnograficzne, vol. I, 1959; by the same author: *Zmiany w stanie ilościowym i rejonizacja hodowli na ziemiach środkowej Polski (Changes in the Quantitative Status and Regional Distribution of Livestock Breeding in the Territories of Central Poland)*, Studia

In the period under discussion the increase of the number of cows was much more considerable than that of oxen. In the territories of the so called Kingdom of Poland oxen constituted nearly 38% of all cattle and in the following years the percentage fell to ca. 32%. At the same time the number of cows was increasing. The significance of oxen as draft animals was decreasing slowly¹². At the beginning of the nineteenth century they constituted in the area under discussion 60% of all draft animals, whereas in 1860 only 55%.

The cattle reared at the half of the nineteenth century in that area preserved less and less its breed characteristics. In a greater part of the area it was a result of rather unsuccessful cross-breeding. In the first half of the nineteenth century breeding of low-land and Frisian (Dutch), Oldenburg and mountain i. e. Tirol, Swiss and Styrian breeds of cattle was common here. At the half of the nineteenth century rearing of English breeds of cattle also became fashionable. The Kholmogorsk cattle from the east was also imported the rearing of which was specially recommended by the governing circles. The increasing influx of German settlers caused also some importation of various cattle breeds which were not always good for the local conditions. Local cows were inseminated by bulls imported or of import origin. It became clear, however, that such usually reckless experimentation in cattle-breeding was not successful.

The activity of the administration authorities must be also mentioned here, because it also influenced the cattle breeding situation in a certain way. In those times we can observe rather clearly some interest of those authorities in the supervision of cattle breeding, and particularly in the protection of cattle against epizooty. It may be added that veterinary law¹³ for the Kingdom of Poland of 1844 was to a degree a pattern for

z *Dziejów Gospodarstwa Wiejskiego*, vol. IV 1961, No. 1; by the same author; *Zwierzęta gospodarskie w Księstwie Warszawskim i w Królestwie Polskim w XIX wieku (Livestock in the Duchy of Warsaw and the Kingdom of Poland in the Nineteenth Century)*, Wrocław—Warszawa—Kraków 1964.

¹² K. Pudło: *Tradycje używania bydła rogatego do prac pociagowych w gospodarstwach chlopijskich w Polsce z koncem XIX wieku i w pierwszej polowie XX wieku (The Tradition of Using Cattle for Traction in Peasant Farms in Poland at the end of the Nineteenth and First Half of the Twentieth Centuries)*, Lud, vol. XLVII, 1962; B. Baranowski: *Z dziejów sprzężaju w Polsce*, in a book by many authors: *Źródła ikonograficzne do historii rolnictwa polskiego, (Iconographic Records for the Study of the History of Polish Agriculture)*, Wrocław—Warszawa—Kraków 1965; by the same author: *Zanik użytkowania wołów jako siły pociagowej w Polsce i w krajach sasiednich (The Disappearance of the Use of Oxen as Draft Animals in Poland and Neighbouring Countries)*, Lud, vol. L, 1966.

¹³ Ustawa policji weterynaryjnej czyli przepisy mające na celu zapobieganie i uśmieranie chorób panujących i zaraźliwych między zwierzętami domowymi i

other states. The meagre veterinary personnel, however, could not achieve the implementation of the basic regulations of that law.

The average weight of cattle increased very slowly in those times. On the other hand the milk yield was increasing much more quickly, owing to much better fodder. About 1860 the average milk yield from one cow was in that area already as high as 700 litres a year.

It is another question and a question which it is very difficult to answer, how much cattle breeding contributed to the development of the marketing value of the production of the serf's farm. We have hardly any peasant farm budget for the period before the partitions of Poland. We can only use some suppositional estimates which must be treated with many reservations. Thus, for a comparative treatment of those problems we can only use some later materials, those of the nineteenth century, we can also use the results of ethnographic research, etc.¹⁴ A general analysis of the problem makes it possible to establish that, owing to a low meat consumption in peasant households, the income resulting from the sale of livestock was a very important item. If we add the income resulting from the sale of butter and cheeses, it will become clear that the peasant obtained from 20 to 40% of his income from cattle breeding products. The incomes resulting from the sale of livestock were the second biggest item of the total income in the serf's budget, after the incomes from the sale of corn.

The proportion of the value of cattle in the total ownership of a peasant's farm differed much in the manorial-serf conditions and after the abolition of serfdom. In nearly all the peasant farms the value of the land cannot be included in the estimate of the value of the farm, because the peasant was in most cases only a user of the land in question. Neither can the value of the buildings be included in all the cases, because the feudal landlord paid for the construction of it or gave building materials. The whole cost of the construction was rather rarely paid for by the peasant. The estimate of the value of the buildings also differed in some cases very much. As compared to the price of the cattle the value of the primitive buildings was very often lower than the value of the cattle of the farm in question. The value of the movables in a peasant's farm was also in most cases rather small. There

(*The Decree of the Veterinary Police or Regulations Aiming at the Prevention and Liquidation of Endemic and Contagious Diseases of Household Animals*), Warszawa 1844.

¹⁴ This question is dealt with more extensively by B. Baranowski: *Znaczenie źródeł etnograficznych dla badań historycznych — Badania nad historią dawnej hodowli bydła* (*The Significance of Ethnographic Sources for Historical Research — Studies in the History of Cattle Breeding in the Remote Past*), Łódzkie Studia Etnograficzne, vol. II, 1960.

were very few expensive iron tools in those times and the value of the wooden tools was very small. The furniture and kitchen utensils in a peasant's farmstead were also of a rather negligible value. Thus, it was the cattle that was the most important part of a peasant's possession¹⁵.

As late as in the first years of the nineteenth century we find a very great number of peasants' farms in which the value of the cattle possessed was higher than the total value of the buildings, tools, movables and of other farm animals. It was during the nineteenth century that those proportions were changed and the value of the buildings, tools, house utensils, beddings, clothes and of other farm animals was increasing faster than the value of cattle.

Cattle breeding was rather negligible in the economy of the manor nearly till the end of the eighteenth century. The manorial fields were cultivated by means of the cattle owned by the peasants. Only few cows were reared in the manorial cowsheds. The income resulting from cattle breeding did not play any important role in manorial economy. The situation was changed, however, quite fundamentally in the first half of the nineteenth century. It was then that the manors started to rear much more cattle in order to obtain more fertilisers, to have more profit from the marketing of milk and livestock and also to have more draft animals of their own. In the territories under discussion cattle belonging to the manors constituted only 20% of the whole number of cattle at the half of the eighteenth century, at the beginning of the nineteenth century ca. 30% and in 1842 already as much as 40.4%.

Rather important changes in cattle-breeding took place after 1864. Those changes had a rather important connection with the widening of fodder resources, caused, among other factors, by the spreading of root-crops and papilionaceous plant cultivation. At the same time the area of cultivated land increased and what is more important, yields were increasing too. This created conditions for rearing greater numbers of livestock and for a more intensive feeding of this livestock. At the same time, owing to agricultural schools and agricultural books and technical journals, new achievements of zootechny were popularised. Cattle was fed in a much more rational way, it was kept in better sheds and much better taken care of. The slow but steady development of the veterinary

¹⁵ B. Baranowski: Znaczenie chowu bydła w ekonomice gospodarki chłopów pańszczyźnianego na ziemiach dawnej Rzeczypospolitej (*The Significance of Cattle Breeding in the Economy of the Serf's Farm in the Territories of the Polish Republic before the Partitions*), in a book by many authors; *Studia historyczne — Księga Jubileuszowa z okazji 70 rocznicy urodzin profesora doktora Stanisława Arnolda*, Warszawa 1965.

service made it possible to fight animal diseases more successfully and to diminish the danger of epizooty, which brought the livestock economy of the preceding periods to a complete decline.

We must also remember that in the territories of the Kingdom of Poland important changes in the economy took place. Those changes were caused by the liquidation of serfdom (1864). The farms of the peasants could now develop in a more intensive way, they could increase their production. The former manorial estates, too, after a period of crisis which caused the liquidation of a big proportion of them, had to adapt themselves to the new conditions and also tended to develop some intensification of their production. On the other hand, however, there were many factors in the territories of the so called Kingdom of Poland which tended to hamper the development of agriculture. As far as livestock breeding is concerned such a hampering factor were the prices of livestock products which were unfavourable to rural economy. The markets of Warsaw and of other towns in the Kingdom of Poland were amply supplied by large numbers of cattle from the Ukraine which contributed to unfavourable prices for cattle breeders. Also the import of wool from other continents created a competition which caused an almost complete decline in sheep breeding in the territories of the Kingdom of Poland (in 1870 there were 4,180 thousand sheep there and in 1913 only 760 thousand). The conditions for marketing dairy products were a little better, though rather bad too. Thus we can say that basically the number of cattle in those territories increased in spite of rather unfavourable conditions for cattle breeding. Before the abolition of serfdom the number of two million was achieved. After the abolition of serfdom this number increased slowly (in 1870 it was 2,166 thousand, in 1881 2,430 thousand, in 1890 it reached 3,013 thousand). It may be established more or less precisely that since 1890 the number of cattle, owing to deteriorating market trends, started slowly to decrease. There were only 2,823 thousand of cattle in 1900, in 1907 only 2,459 thousand, 2,301 thousand in 1910, 2,211 thousand in 1912 and 2,224 thousand in 1913. We may however suspect that the figures of the first years of the nineteenth century censuses were too low, because the peasants who were afraid of the taxes based upon the number of cattle declared smaller numbers of cattle than actual.

Rather important changes took place in cattle breeding when we count the cattle in terms of the so called "big animals". The following system of counting the cattle was used in the second half of the nineteenth century: one cow or one ox = $\frac{2}{3}$ of a horse = 4 pigs = 10 sheep. We present below the data from 1870, 1889 and 1907.

The structure of livestock breeding in the so called Kingdom of Po-

land after the liberation of the serfs as counted in terms of the so called "big animals" (in percentage)

	1870	1899	1907
horses	27,7	36,6	40,6
pigs	6,8	5,3	3,9
sheep	10,4	5,3	3,0
cattle in general	55,1	52,8	52,5
(cows)	(29,5)	(35,2)	(37,2)

Counted in terms of the numbers of livestock per one square kilometer there were 17.5 cattle in 1870, 24.0 in 1899 and 19.5 in 1907. In terms of the number of cattle and 1000 inhabitants ratio the figures were decreasing very much. There were 370 cattle for each 1000 of population in 1870, 313 in 1899 and only 219 in 1907.

The process of the disappearance of ox traction in the peasant farms those times. During the nineteenth century there was a considerable decline in using oxen as draft animals, which was caused by many factors (such as the changes in the prices of corn and meat, the decrease of the pasture land acreage and the accompanying decrease in the number of fodder at the disposal of the majority of the peasant farms, the increase in the value of labour, much more of which was necessary for the maintenance of ox traction than for horse traction, the increasing possibilities of additional income from work in horse serviced transport and excavation work, the spreading of new agricultural implements for which the horse was much better than the ox etc.) and also a change in the mode of life (more and more frequent visits to the markets and fairs in the neighbouring country towns), a fashion or even a kind of snobbery (in the rural community a young man who would have come to court his girl on foot or with hired or borrowed horses was exposed to ridicule).

The process of the disappearance of ox traction in the peasant farms did not take place simultaneously in all the areas under discussion and it was different in different areas too. It was earliest in the territories of the Prussian partition of Poland, but there it was very slow. In the peasant farms of the Grand Duchy of Poznań oxen constituted only 22.3% of the traction used in 1867, 13.2% in 1892, 5.9% in 1912; in the Gdańsk Pomerania (the so called Western Prussia) the figures were 17.8% in 1867, 8.0% in 1892, and 2.8% in 1912¹⁶. This process started

¹⁶ Preussische Statistik, vol. XXI, Berlin 1871; vol CXXIX, Berlin 1894; vol. CCXLI, Berlin 1916.

somewhat later in the Austrian partition of Poland, where ox traction survived in great numbers until recent times. This process started at the latest in the Kingdom of Poland where ox traction decreased at a minimal rate until 1870. As late as in 1870 oxen constituted in the Kingdom of Poland ca. 53% of the whole traction and it was only after 1870 that there was a rapid disappearance of it. Oxen constituted only 13.0% of the whole traction in 1899 and in 1907 only 6.5%¹⁷. In 1870 oxen constituted still ca. 32% of the whole number of cattle and in 1899 only 5% and in 1907 less than 3%.

At the same time the significance of cow breeding increased very much. Cows constituted 53.5% of all cattle in 1870, 66.7% in 1899 and 70.8% in 1907.

In the territories discussed in the present article at the beginning of the period discussed cattle presented a picture of a sort of mosaic of a number of races and varieties both local and primitive, and imported ones and also of the products of not always successful cross-breeding. Cattle of local extraction was still most numerous, mostly of red colour or red-brown, comparatively small, but characterized by considerable sturdiness and adaptation to living conditions.

After the abolition of serfdom, breeding of various imported races of cattle was continually spreading. The breeding of lowland cattle, particularly of Frisian (Duch) origin and of black-and-white colour was most popular. That cattle was very successful for dairy products purposes, but at the same time it was much more exacting in terms of living conditions. That cattle underwent a lot of cross-breeding with many other races, which caused specific varieties to arise in particular areas. Attempts were made in the discussed area to breed the other races of cattle. Farms specializing in this direction attained some initial success. For a time there was a great demand for that kind of cattle. Later on, however, breeding of that cattle was limited or completely abandoned.

The height and weight of cattle increased slowly. Rather small cattle, however, continued to constitute the majority of all cattle breed. As late as in the first years of the twentieth century the average weight of cows for slaughter was ca. 280 kilogrammes in the discussed area. Milk production also increased. An average milk yield from one cow in 1870 in the discussed area was ca. 800 litres a year, and it reached the figure of 1,200 litres before the first World War.

¹⁷ Trudy Warszawskiego Statystycznego Komitetu, vol. XVIII, Warszawa 1901; vol XXXVI, Warszawa 1908; Rocznik Statystyczny Królestwa Polskiego 1913, Warszawa 1914; S. Janicki: Stosunki rolnicze Królestwa Kongresowego (*The Agricultural Conditions of the Kingdom of Poland*), Warszawa 1918.

The first World War caused very serious decrease in the number of cattle. The losses for the whole Kingdom of Poland during the first World War are estimated at about 20%. In the twenty years between the wars the number of cattle increased again. Probably as soon as in 1924 it reached the pre-war status and later the number of cattle was much greater than before the war¹⁸.

The status of cattle breeding in 1927 and 1938 in the areas of
Central Poland

Voivodeships	per 1 km ²		per 100 ha of agricultural land		per 1000 inhabitants	
	1927	1938	1927	1938	1927	1938
Warsaw	24.8	26.8	30.3	37.7	316	347
Lodz	27.3	31.0	34.2	43.7	208	239
Kielce	24.8	32.7	35.2	47.7	221	280
Lublin	23.4	28.1	31.8	39.6	316	353
The Republic of Poland	22.2	34.8	32.5	41.2	288	327

Breeding of oxen played hardly any role in the territories of Central Poland between the wars. E. g. in 1933 only 3,5 thousand oxen were bred in the territories of the 4 above mentioned voivodeships.

Between the wars the territories of Poland were divided into regions in which breeding of the red Polish cattle, lowland cattle or symmentale cattle was promoted respectively. Very great numbers of farmers still continued, however, to breed cattle which was completely no good for the area and conditions prevailing in the area in question. According to the estimates of 1928 red cattle constituted 26.9%, and black-and-white lowland cattle 34.6%, symmentale cattle 3.9% and mixed cattle of no race 34.6% of the whole number of cattle respectively. The breeding of the black-and-white lowland cattle prevailed in the territories of Central Poland. At the same time, however, there was a predominance of the Polish red cattle or of mixed cattle of no race¹⁹.

The weight of cattle increased very much. The average weight of

¹⁸ E. Szturm de Sztrem: *Inwentarz żywy w Polsce (Livestock in Poland)*, Kwartalnik Statystyczny, vol. V, 1928, No. 2; A. Zabko-Potopowicz: *Rolnictwo w Polsce, stan, bolączki, zadania, drogi naprawy (Agriculture in Poland, Conditions, Difficulties, Tasks, Ways of Improvement)*, Warszawa 1938.

¹⁹ P. Szumowski and Z. Jastrzębowski: *Przyczynek do studiów nad geograficznym rozmieszczeniem ras zwierząt domowych w Polsce, (A Contribution to the Studies in the Geographic Distribution of the Races of Domestic Animals in Poland)*, Kwartalnik Statystyczny, vol. X, 1933, No. 2.

cows to be killed for meat was 309 kilogrammes in 1930 and 318 kilogrammes in 1938 respectively. Milk production also increased very much. The average milk yield from one cow was 1,350 litres in 1928 and 1,420 litres in 1938.

The number of cattle decreased very much again during the Second World War. There was only 40% of the pre-war number of cattle in the territories of Poland in 1946. There was, however, a slow but steady increase in the number of cattle. Today it is greater than before the war. The weight of cows for slaughter also increased very much. It is now greater than before the war. The milk yield of cows is also increasing. The average milk yield from one cow was 2,130 litres in 1965.

The intensification of cattle breeding production caused an increase in the milk and beef production — population ratio, in spite of the tremendous increase of population²⁰. At the end of the 18th century milk production for one inhabitant in the discussed territories was ca. 80—90 litres a year, it was 100—120 litres at the beginning of the nineteenth century, 150—160 litres in about 1860, ca. 200 litres in 1900, 288 litres in 1938 and it is more than 400 litres today. Beef and veal production was 4 kilogrammes for 1 inhabitant at the end of the eighteenth century, 5 kilogrammes at the beginning of the nineteenth century, 7 kilogrammes about 1860, 8 kilogrammes about 1900, 8 kilogrammes in 1938 and today the ratio is ca. 14 kilogrammes.

²⁰ B. Baranowski: Próba obliczenia rozmiarów produkcji rolniczej i jej konsumpcji w czasach Księstwa Warszawskiego i Królestwa Polskiego (1807—1830) (*A Tentative Estimate of the Bulk of Agricultural Production and Its Consumption in the Times of the Duchy of Warsaw and the Kingdom of Poland (1807—1830)*), *Kwartalnik Historii Kultury Materialnej*, Yearbook VIII, 1960, nr 2.

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