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**Zarastanie zbiornika zaporowego w Goczałkowicach
w latach 1967—1969**

**The overgrowing of the dam reservoir at Goczałkowice
in the years 1967—1969**

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Abstract — The present work is a continuation of many years' observations on the overgrowing of the dam reservoir at Goczałkowice with vascular vegetation, carried out since the beginning of the existence of this reservoir, i.e. since 1956. Within the last few years a certain stabilization of this vegetation has been observed, greater changes taking place chiefly as an effect of very low and high water levels.

Investigations on the overgrowing of the dam reservoir at Goczałkowice with aquatic flowering vegetation have been carried out from the beginning of its construction, i.e. since 1956. The present paper deals only with the more important changes observed in the years 1967—1969.

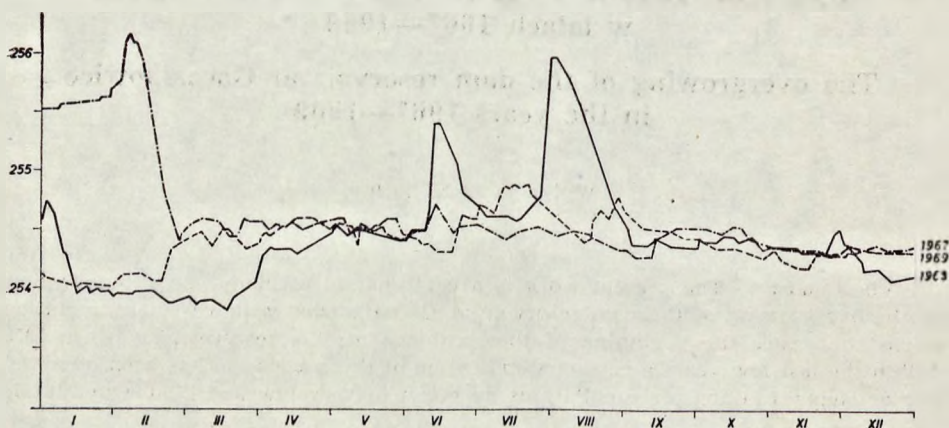
The methods of these investigations were the same as in the preceding years. Thus, to determine the overgrowing of the reservoir, monthly observations of the state of vegetation were carried out from a boat during the period of full vegetation (from June to October), new or more interesting plant species being collected. A map of the distribution of the investigated vegetation was drawn every year.

**Hydrological conditions in the reservoir
during the period of investigations (1967—1969)**

Inconsiderable fluctuations in the water level were noted in the Goczałkowice reservoir in 1967. With the exception of the winter months, the water level varied around the 254.60 m contour line above sea-level. In February it exceeded 256 m above sea-level, but this lasted only for a short period of time (10 days).

In 1968 the fluctuations in the water level were very marked. In March it fell to below the 254 m contour line, in June it suddenly rose to 255.70 m above sea-level, and at the end of July and beginning of August reached a maximum of 256 m above sea-level. All species of submerged plants, and partly also emergent ones, were covered during a fairly long period of time (from 26th July to the 15th of August) with a layer of water.

In 1969 the fluctuations were very slight. Even during the summer flood maximum they did not reach the 255 m contour line. The course of fluctuations of the water level in the Goczałkowice reservoir in the years 1967—1969 is illustrated by a diagram in fig. 1.



Ryc. 1. Wahania poziomu wody w zbiorniku goczałkowickim w latach 1967—1969
Fig. 1. Fluctuations in the water level in the dam reservoir of Goczałkowice in the years 1967—1969

Results

Investigations on the overgrowing of the reservoir with flowering vegetation carried out over a number of years (Ćwiertnia 1962, 1966, Kuflikowski 1968) showed that a certain stabilization of this vegetation had taken place of late. More significant changes were noted only in the year succeeding that in which considerable fluctuations of the water level had occurred.

The area occupied by some species of plants, as e.g. *Salvinia natans* (L.) All. or *Elodea canadensis* Rich., changes irrespective of variations in the water level in the reservoir.

Particularly worthy of note is the appearance of new species of plants not previously encountered in the Goczałkowice reservoir. These are: *Trapa natans* L., *Potamogeton perfoliatus* L., and *Najas marina* L.

Trapa natans L. was first observed in the reservoir in 1965, when three shoots were displaced and carried by waves to the harbour near the dam. It was presumed at that time that they were brought in with the waters of the river Bajerka from the higher lying ponds, where *Trapa* is a common component of the aquatic vegetation. It was only in 1968 that a stand of this species composed of three plants was found in the south-eastern part of the reservoir in the proximity of Czarnolesie. After observation of this stand the level of the water in the reservoir rose fairly markedly, and when it fell *Trapa natans* was no longer to be found. Presumably, during the increased undulation of the water the few specimens were destroyed.

In 1969 three stands of this plant were found, two in the old valley of the river Bajerka and one in the proximity of Czarnolesie. At all these places they grew at a depth of about 1 metre.

Potamogeton perfoliatus L. was observed for the first time in 1969 at one location in the northern part of the reservoir at a short distance from the fishing harbour at Łąka. It was a small conglomeration of plants composed of some ten individuals.

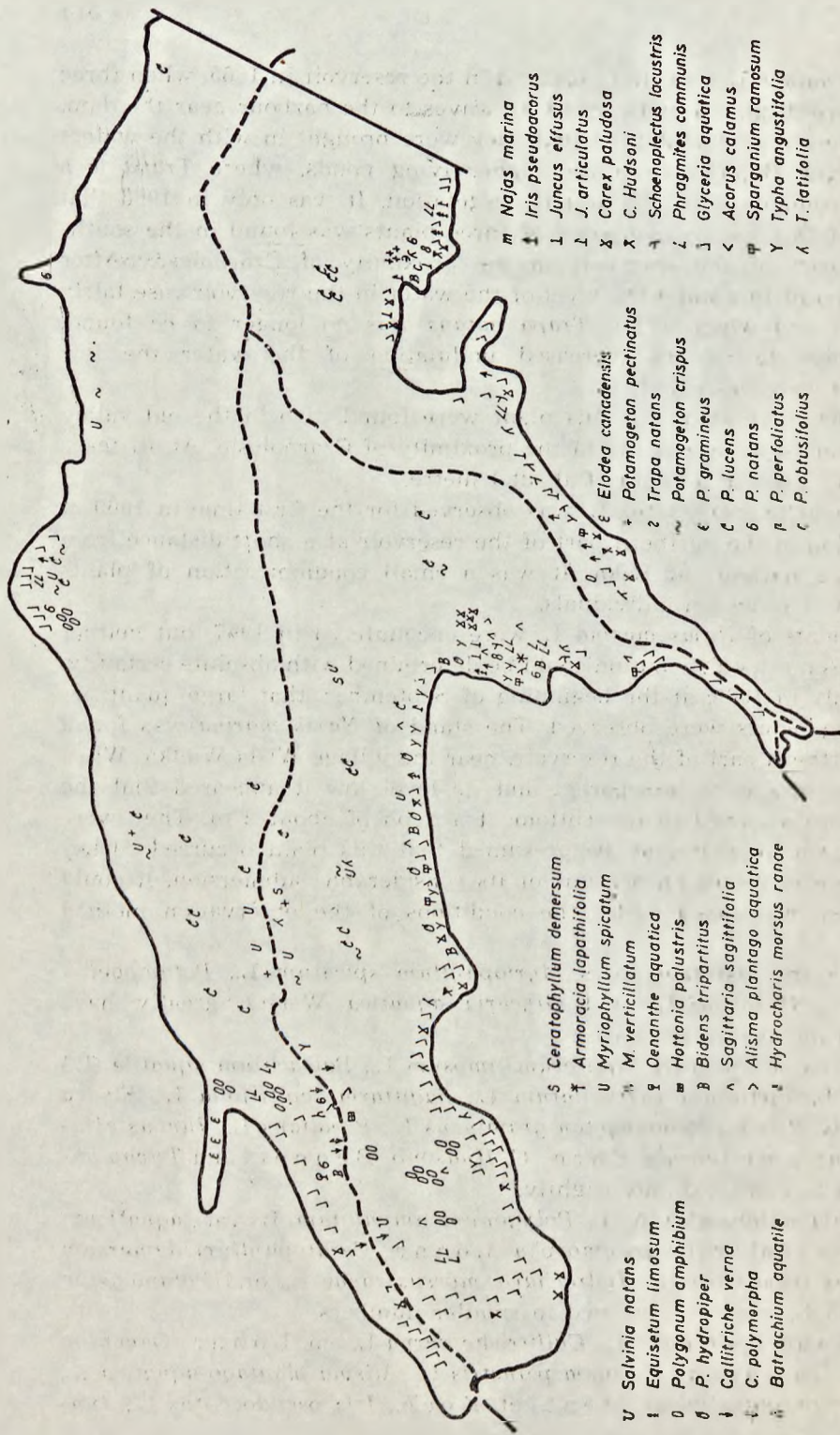
Fragments of *Najas marina* L. were encountered in 1967, but neither the species nor its distribution could be determined with absolute certainty. It was only in 1969, at the beginning of September, that large quantities of floating plants were observed. The stand of *Najas marina* was found in the northern part of the reservoir, near the village Wisła Wielka. When the water was very transparent and its level low it appeared that the plants were attached to the bottom at a depth of about 2 m. They were up to 50 cm long. It may be presumed that this plant occurred earlier in the reservoir but, on account of its considerable submersion, it could have been overlooked under the conditions of the observation method applied.

Within the last few years *Myriophyllum spicatum* L., *Potamogeton crispus* L., *P. lucens* L., and *Glyceria aquatica* W a h l. greatly have increased the overgrown area.

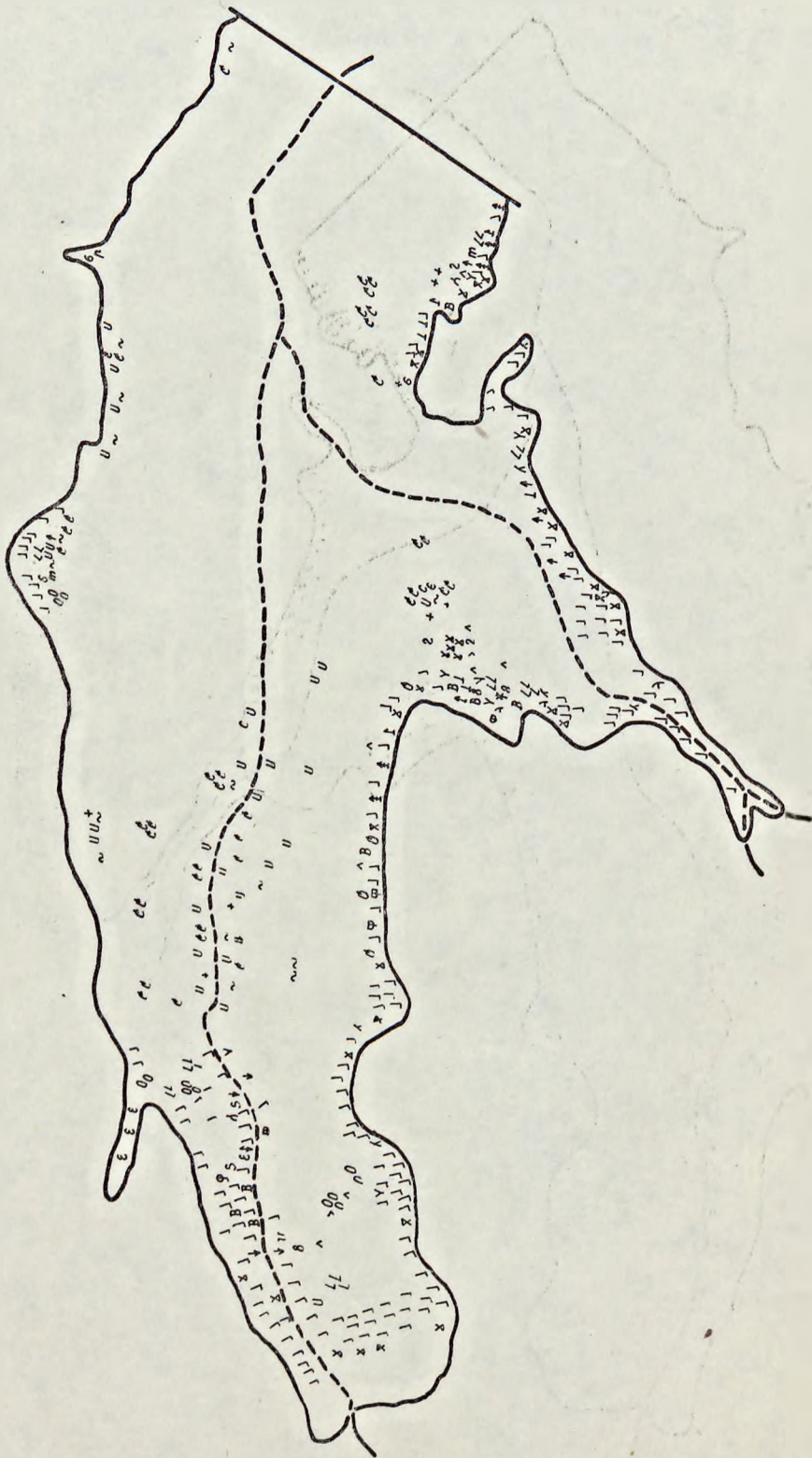
The area occupied by *Equisetum limosum* L., *Batrachium aquatile* (L.) D u m., *Myriophyllum verticillatum* L., *Sagittaria sagittifolia* L., *Elodea canadensis* R i c h., *Potamogeton gramineus* L., *P. natans* L., *Juncus effusus* L., *Carex acutiformis* E h r h., *C. Hudsonii* B e n n e t, and *Typha angustifolia* L. increased only slightly.

Salvinia natans (L.) A l l., *Polygonum amphibium* L. var. *aquaticum* L e y s s e r, *Callitriche polymorpha* L ö n n r., *Ceratophyllum demersum* L., *Bidens tripartitus* L., *Hydrocharis morsus ranae* L., and *Potamogeton pectinatus* L. were encountered in smaller numbers.

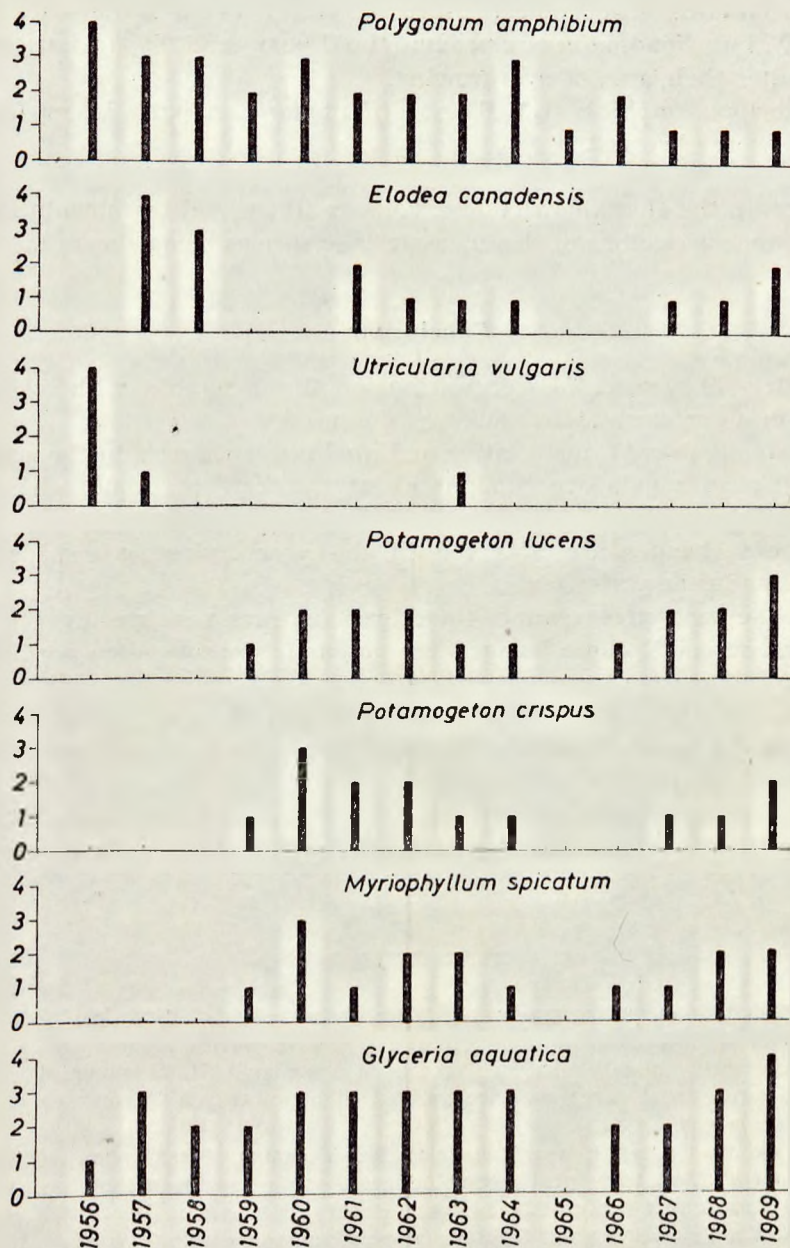
Polygonum hydropiper L., *Callitriche verna* L. em L ö n n r., *Oenanthe aquatica* L a m a r c k, *Hottonia palustris* L., *Alisma plantago-aquatica* L., *Potamogeton obtusifolius* M e n t. et K o c h., *Iris pseudoacorus* L., *Jun-*



Ryc. 2. Rozmieszczenie roślin w 1967 roku
 Fig. 2. Distribution of plants in 1967



Ryc. 4. Rozmieszczenie roślin w 1969 roku
 Fig. 4. Distribution of plants in 1969



Ryc. 5. Sukcesje przewodnich gatunków roślin w zbiorniku goczałkowickim wg 4-stopniowej skali szacowania: 1 = 0,3–0,5 ha, 2 = 0,5–1 ha, 3 = 1–5 ha, 4 = 5–10 ha

Fig. 5. Successions of leading plant species in the dam reservoir of Goczałkowice according to 4 degrees evaluation scale: 1 = 0.3–0.5 ha, 2 = 0.5–1 ha, 3 = 1–5 ha, 4 = 5–10 ha

cus articulatus L., *Schoenoplectus lacustris* (L.) Palla, *Phragmites communis* Trin., *Sparganium ramosum* Hudson, and *Typha latifolia* L. did not alter their area of overgrowing.

No *Rorippa amphibia* (L.) Bess., *Utricularia vulgaris* L., or *Lemna minor* L. were observed.

All the above mentioned changes in the distribution of aquatic vegetation in the Goczałkowice reservoir are illustrated by maps in figs 2, 3, and 4, the successions of the characteristic species being shown in fig. 5.

Conclusions

1. After 14 years of overgrowing of the reservoir with vascular vegetation a certain stabilization was observed.

2. More significant quantitative and qualitative changes in the specific composition of plants are brought about by very low and high water levels in the reservoir.

3. These changes are observed in the year following considerable fluctuations in the water level.

4. In the past three years of investigations three new species of plants have been observed, these being *Trapa natans* L., *Potamogeton perfoliatus* L., and *Najas marina* L.

5. On the other hand, *Rorippa amphibia* (L.) Bess., *Utricularia vulgaris* L., and *Lemna minor* L. were not encountered, having most probably disappeared entirely.

6. The area occupied by *Potamogeton lucens* L., *P. crispus* L., *Myriophyllum spicatum* L., and *Glyceria aquatica* (L.) Wahl. became much larger.

STRESZCZENIE

W latach 1967—1969 kontynuowano dalsze obserwacje nad rozwojem roślinności wodnej i jej rozmieszczeniem w zbiorniku zaporowym w Goczałkowicach. W ciągu tych lat nastąpiły dalsze zmiany, dotyczące zwiększenia bądź też zmniejszenia powierzchni zajmowanej przez niektóre gatunki albo pojawienia się nowych czy też zaniku istniejących.

Przybyły trzy gatunki, a mianowicie: *Trapa natans*, *Potamogeton perfoliatus* i *Najas marina*. Jest małe prawdopodobieństwo, aby powyższe gatunki roślin występowały wcześniej i nie zostały zauważone. Przykładem może być *Trapa natans*, którą znaleziono pomimo pojawienia się w pojedynczych egzemplarzach.

Najas marina spotkano dopiero na początku września. Na powierzchni wody pływały fragmenty pędów, nie zauważone wcześniej. Okazało się, że rosły one na głębokości ok. 2 m razem z *Polygonum amphibium* i *Potamogeton lucens*. Obserwacja ta była możliwa tylko dzięki wyjątkowo dużej przezroczystości i niskiemu poziomowi wody.

Zanikły natomiast takie gatunki, jak: *Rorippa amphibia*, *Utricularia vulgaris* i *Lemna minor*.

Do dalszych zmian należał znaczny wzrost powierzchni opanowanej przez następujące gatunki: *Glyceria aquatica*, *Myriophyllum spicatum*, *Potamogeton crispus*, *P. lucens*, *Carex paludosa* i *Elodea canadensis*, natomiast znacznie zmniejszył się udział: *Polygonum amphibium* i *Potamogeton pectinatus*. Wszystkie te zmiany zaznaczyły się szczególnie w roku następnym po dużych wahanach poziomu wody.

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